

A CRITICAL SURVEY ON FOUR DISTINCTIVE  
APPROACHES OVER THE CAUSES OF THE RECENT  
GLOBAL CRISIS

A THESIS SUBMITTED TO  
THE GRADUATE SCHOOL OF SOCIAL SCIENCES  
OF  
MIDDLE EAST TECHNICAL UNIVERSITY

BY

GÜNEY DÜZÇAY

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS  
FOR  
THE DEGREE OF MASTER OF ARTS  
IN  
THE DEPARTMENT OF ECONOMICS

AUGUST 2013

Approval of the Graduate School of Social Sciences

---

Prof. Dr. Meliha Altunışık  
Director

I certify that this thesis satisfies all the requirements as a thesis for the degree of  
Master of Science/Arts / Doctor of Philosophy.

---

Prof. Dr. Erdal Özmen  
Head of Department

This is to certify that we have read this thesis and that in our opinion it is fully  
adequate, in scope and quality, as a thesis for the degree of Master of  
Science/Arts/Doctor of Philosophy.

---

Asst. Prof. Dr. Hasan Cömert  
Supervisor

**Examining Committee Members**

Asst. Prof. Dr. Gökçer Özgür (Hacettepe University, Econ) \_\_\_\_\_

Asst. Prof. Dr. Hasan Cömert (METU, Econ) \_\_\_\_\_

Asst. Prof. Dr. Seven Ağır (METU, Econ) \_\_\_\_\_

**I hereby declare that all information in this document has been obtained and presented in accordance with academic rules and ethical conduct. I also declare that, as required by these rules and conduct, I have fully cited and referenced all material and results that are not original to this work.**

Name, Last Name: Güney Düzçay

Signature:

## **ABSTRACT**

### **A CRITICAL SURVEY ON FOUR DISTINCTIVE APPROACHES OVER THE CAUSES OF THE RECENT GLOBAL CRISIS**

Düzçay, Güney

MA, Department of Economics

Supervisor: Asst. Prof. Dr. Hasan Cömert

August 2013, 307 pages

This thesis aims to comprehend the causes of the global crisis of 2007/08 in a coherent way by elaborating on four distinctive approaches over the causes of the crisis. These approaches consist of financial system-related explanations, in which innovations, regulatory problems and incentives problem are focused on; monetary-policy-based explanations; global-imbalances-based explanations; and finally long-term structural-problems-based explanations. The main findings of this thesis are as follows. Financial innovations, regulation and supervision failures, and incentive problems explain much of the characteristics of the crisis. The depth of the financial crisis was related with system-wide leverage, excessive risk-accumulation and unleashing of self-reinforcing mechanisms of finance by three-decade long financial liberalization. Deep recession and subsequent stagnation can be related to effects of the financial crisis on financial and household sectors' balance-sheets and declining profit rates as a consequence of the structural problems of the US capitalism. On the other hand, monetary policy stance of the Federal Reserve does not seem as effective on credit boom determinants during the 2000s. Finally, global-imbalances-explanation of the crisis misinterprets the possible international sources of the crisis by exaggerating the role of developing countries in global financing patterns.

**Keywords:** Global Financial Crisis of 2007-2008, Financial System, Monetary Policy, Global Imbalances, Structural Causes of Crisis

## ÖZ

### A CRITICAL SURVEY ON FOUR DISTINCTIVE APPROACHES OVER THE CAUSES OF THE RECENT GLOBAL CRISIS

Düzçay, Güney  
Yüksek Lisans, İktisat Bölümü  
Tez Yöneticisi: Yrd. Doç Dr. Hasan Cömert  
Ağustos 2013, 307 sayfa

Bu tez, 2007/08 küresel krizinin nedenlerine dair dört farklı yaklaşımı detaylıca inceleyerek, krizin nedenlerini tutarlı bir şekilde kavramayı amaçlamaktadır. Bu yaklaşımlar, içinde finansal yeniliklere, düzenleme sorunlarına ve teşvik sorunlarına odaklanılan finansal sistem bazlı açıklamaları; para politikası bazlı açıklamaları; küresel dengesizlikler bazlı açıklamaları; ve uzun vadeli yapısal sorunlar bazlı açıklamaları içermektedir. Bu tezin temel bulguları şöyledir. Finansal yenilikler, düzenleme ve denetim sorunları, ve teşvik sorunları krizin karakteristik özelliklerinin çoğunu açıklamaktadır. Finansal krizin derinliği sistem genelindeki kaldıraçlamayla, aşırı risk birikimiyle ve otuz yıllık finansal serbestleşme döneminin zincirlerinden boşandırdığı finans alanının kendi kendini besleyen ve pekiştiren mekanizmalarıyla ilgilidir. Derin resesyona ve takip eden durgunluk ise finansal krizin hanehalkı ve finans sektörlerinin bütçe dengeleri üzerindeki etkisiyle ve ABD kapitalizminin yapısal sorunlarının sonucu olan azalan kâr oranlarıyla ilişkilendirilebilir. Öte yandan, Fed'in para politikası 2000'li yıllardaki kredi patlamasının belirleyicileri üzerinde etkili görünmemektedir. Son olarak, krizin küresel dengesizlikler bazlı açıklaması, gelişmekte olan ülkelerin küresel finansal akımlardaki rolünü abartarak krizin olası uluslararası kaynaklarını yanlış yorumlamaktadır.

Anahtar Kelimeler: 2007-2008 Küresel Finansal Krizi, Finansal Sistem, Para Politikası, Küresel Dengesizlikler, Krizin Yapısal Nedenleri

## **ACKNOWLEDGMENTS**

First and foremost, the author would like to express his sincerest gratitude to his supervisor Asst. Prof. Dr. Hasan Cömert for his guidance, advice, criticism, insight and encouragement throughout the research. The author also would like to thank Assoc. Prof. Dr. Gökçer Özgür and Asst. Prof. Dr. Seven Ağır for accepting to take part on examining committee and for their valuable comments and contributions.

The author wishes to acknowledge his debt to Prof. Dr. Fikret Şenses and Prof. Dr. Cem Somel for their contributions to his knowledge with their invaluable lectures in METU.

The author also wishes to thank his parents and his friends Gökalp Alpan, Ahmet Benlialper and Serdal Tümkaya, who make life and working easier and better.

## TABLE OF CONTENTS

PLAGIARISM.....	iii
ABSTRACT.....	iv
ÖZ.....	v
ACKNOWLEDGMENTS.....	vi
TABLE OF CONTENTS.....	vii
LIST OF TABLES.....	xii
LIST OF FIGURES.....	xiii
LIST OF ABBREVIATIONS.....	xvii
CHAPTER	
1. INTRODUCTION.....	1
2. FINANCIAL SYSTEM AND THE CRISIS.....	10
2.1.Characteristics of the Recent Crisis.....	12
2.1.1. Subprime Mortgage Collapse.....	12
2.1.2. Constituents of the Financial Crisis.....	21
2.2.Financial Innovations and New Financial Practices that are related with the Crisis.....	28
2.2.1. Basics for Securitization, Derivatives, Off-Balance-Sheet vehicles and Wholesale Funding Mechanisms.....	29
2.2.1.1. Securitization: operation, functions and statistics.....	29
2.2.1.2. Special Purpose Vehicles.....	37
2.2.1.3. Wholesale Borrowing Markets.....	38

2.2.1.4. Derivatives .....	40
2.2.2. Cases for the role of securitization and related practices in the crisis.....	44
2.2.2.1. Securitization, regulatory arbitrage and leverage .....	44
2.2.2.2. Securitization and accumulation of systemic risks .....	49
2.2.2.3. Securitization and credit boom .....	54
2.3. The role of Leverage and Self-Reinforcing Mechanisms of Finance .....	61
2.3.1. Self-Reinforcing Mechanisms of Finance and Empirics about the Leverage in Financial Sector .....	64
2.3.2. “Leverage Cycle Theory” .....	72
2.3.3. The role of regulations in high system-wide leverage and the effect of them on self-reinforcing feedback mechanisms.....	79
2.4. The role of some incentive structures in the build-up of financial vulnerabilities .....	81
2.4.1. Remuneration systems and other incentive structures related with excessive risk-taking .....	81
2.4.2. Incentive problems of credit rating agencies .....	88
2.4.3. Perverse incentives arisen from recurrent bailouts.....	90
2.5. The Role of Deregulation, Inefficient Supervision and Government failures in the crisis .....	92
2.5.1. Cases for Deregulation, Lack of Regulation, Regulatory conflicts and inefficient supervision.....	92
2.5.2. “Government Housing Policy Failure” argument .....	99
2.6. Conclusion.....	107
3. MONETARY POLICY AND THE CRISIS .....	114
3.1. Was monetary policy inappropriately loose? .....	116
3.2. The relationship between the Federal Funds rate and housing boom ...	120

3.2.1. Monetary Policy Transmission Mechanisms and Housing Market.....	121
3.2.1.1. Interest rate channel .....	121
3.2.1.2. Wealth channel .....	122
3.2.1.3. Balance-sheet, credit channels .....	122
3.2.2. A case for that monetary policy caused housing bubble .....	123
3.2.3. Discussions on the effects of monetary policy over long term interest rates and housing bubble.....	126
3.2.4. Is there any role for adjustable-rate mortgages on the US housing boom?.....	130
3.2.5. Does monetary policy explain the global housing boom?.....	134
3.3. Could the Fed prevent the Housing Bubble? .....	138
3.4. Conclusion.....	144
4. GLOBAL IMBALANCES AND THE CRISIS .....	149
4.1. Some hypotheses that base on saving-investment framework and link global imbalances to the crisis .....	152
4.1.1. Global Saving Glut hypothesis .....	152
4.1.1.1 Theoretical Framework: Saving and Investment approach ....	153
4.1.1.2. What are the ultimate causes of global saving glut?.....	157
4.1.1.3. How asset prices and interest rates equilibrated global imbalances? .....	159
4.1.2. Some Critics to Global Saving Glut Hypothesis .....	162
4.1.2.1. “Global Investment Drought” .....	162
4.1.2.2. “Twin-Deficit” Hypothesis .....	166
4.1.2.3. The role of other Internal Factors on Global Imbalances: Accommodative Monetary Policy, Housing Bubble and Home-grown financial imbalances in the Industrial World.....	167

4.2. Discussion on the saving-investment framework and its implications on the ultimate determinants of global imbalances .....	168
4.2.1. Discussion on the saving-investment theoretical framework .....	168
4.2.1.1. Does saving-investment framework explain the global financing patterns?.....	169
4.2.1.2. Does saving-investment framework explain interest rate movements? .....	171
4.2.1.3. Some methodological problems of the interpretations that rely on saving-investment framework .....	174
4.2.2. Discussion on the Ultimate causes of the Global Imbalances .....	177
4.2.2.1. Direct Consequences of the Financial Crisis in the Developing World .....	178
4.2.2.2. Growth strategies and related economic policies of some developing countries, particularly the role of official reserve accumulation.....	182
4.2.2.3. Escalation in Oil Prices.....	186
4.2.2.4. Differentiation in financial deepness .....	188
4.3. Links of Net capital flows to Housing Boom and Financial Imbalances.....	191
4.3.1. From capital flows to interest rates.....	192
4.3.2. From capital flows to the housing boom .....	194
4.3.3. From capital flows to financial vulnerabilities .....	198
4.3.4. Empirical evidences that deny “global imbalances” explanation of the crisis .....	202
4.4. Conclusion.....	206
5. STRUCTURAL CAUSES OF THE CRISIS .....	212

5.1. Were Inequality and Aggregate Demand Problems the underlying causes of the crisis? .....	214
5.1.1. Heterodox approaches on wage stagnation and inequality as the root causes of the crisis.....	215
5.1.2. Marxist approaches on wage stagnation and inequality as the root causes of the crisis.....	225
5.1.3. The link between inequality, aggregate demand problems and financial excesses .....	250
5.2. Was profitability underlying cause of the crisis? .....	264
5.3. Conclusion.....	274
6. CONCLUDING REMARKS: A SYNTHETIC EXPLANATION FOR THE CRISIS .....	281
REFERENCES.....	296

## LIST OF TABLES

### TABLES

Table 2.1 Mortgages Originated by Banks and Mortgage Companies.....	94
Table 2.2 Mortgage Outstanding Debt by Type of Holder (all types of mortgages), 2006-2009Q4, Millions of Dollars.....	106
Table 5.1 Debt-to-Income ratios by income groups in the US, 1989-2007.....	255

## LIST OF FIGURES

### FIGURES

Figure 1.1 GDP growth rates for selected countries, country groups and the world, 2001-2011 .....	2
Figure 1.2 Unemployment, Long-Term Unemployment and Youth Unemployment in the US, European Union and Japan, 2001-2011. ....	3
Figure 2.1 Movement of ABX indices for differently rated classes of subprime related ABSs .....	14
Figure 2.2 US Residential Mortgage Delinquency Rates .....	15
Figure 2.3 US Residential Mortgage Foreclosure Rates.....	16
Figure 2.4 National Composite Home Price Index for the US .....	18
Figure 2.5 US Mortgage Debt Outstanding, 1970-2012.....	20
Figure 2.6 TED Spread .....	22
Figure 2.7 Asset-Backed Commercial Paper Outstanding, Billions of Dollars, Seasonally Adjusted, 2003-2009.....	24
Figure 2.8 The Repo- Haircut Index .....	26
Figure 2.9 The components of Asset-Backed Securities Issuance in the US.....	32
Figure 2.10 The US Agency Mortgage Securities Issuance, USD Millions.....	33
Figure 2.11 US Agency Mortgage Securities Outstanding, USD Millions .....	33
Figure 2.12 The Shares of Private sector and Government-Sponsored Enterprises (GSEs) in Mortgage-Backed Security Issuance (1996-2011).....	34
Figure 2.13 US Agency Collateralized Mortgage Obligation (CMO) Issuance .....	35
Figure 2.14 The comparative volume of Collateralized Debt Obligations among other securitization and tranching activities.....	36
Figure 2.15 Global CDO Issuance, USD-Denominated CDO Issuance and Structured Finance CDOs (USD Millions) .....	36

Figure 2.16 Total notional amount of Credit Default Swaps outstanding, USD billions.....	42
Figure 2.17 Balance-Sheet Profile of 10 Large Banks.....	48
Figure 2.18 Bank Equity Price Changes and Balance-Sheet Leverage of Large Banks.....	49
2.19 Issuance of Subprime Mortgage-Backed Securities, 1995-2010, Quarterly data, seasonally adjusted. ....	55
Figure 2.20 Leverage in the US financial sector.....	66
Figure 2.21 Guarantees and Committed Credit Lines as percentage total assets for the US banks, 2000-2009 .....	68
Figure 2.22 Leverage, Housing Prices and Securities Prices.....	75
Figure 2.23 Bonuses and Pre-tax Profits of Wall-Street firms over time .....	84
Figure 3.1 The Federal Funds Rate and Different Taylor Rule Prescriptions .....	117
Figure 3.2 John Taylor’s simulations on the effect of different monetary policy stances on housing starts .....	125
Figure 3.3 Paths of ffr, 10-year Mortgage rate and Treasury Bonds rate, (1972-2011).....	127
Figure 3.4 The share of Adjustable-rate Mortgages according to two datasets .....	131
Figure 3.5 The average interest rate on 1-year Adjustable Rate Mortgages in the US.....	132
Figure 3.6 Monetary Policy and Housing Prices in Advanced Countries.....	136
Figure 3.7 Current Accounts and Housing Prices in Advanced Countries .....	137
Figure 4.1 Current Account Balances of Country Groups and Selected Countries, in millions \$US, 1990-2011 .....	150
Figure 4.2 Current Account Balances of Selected Countries, as a percentage of GDP, 1980-2011 .....	150
Figure 4.3 Determination of Interest rate and Realized Saving and Realized Investment levels.....	155
Figure 4.4 Long-Term Interest Rates in Selected Advanced Countries, 1990-2012 .....	161

Figure 4.5 Figure.4.5 Gross National Savings and Investment (as percentage of GDP) for Country Groups and the World, 1984 -2006.....	164
Figure 4.6 An example of saving and investment shifts that result in low interest rate. ....	165
Figure 4.7 Current Account Balances of Selected East Asian and Southeast Asian Countries as a percentage of GDPs, 1980-2011 .....	180
Figure 4.8 Reel Effective Exchange Rate Indices for Selected East Asian and Southeast Asian Countries, 1994-2010 (2010=100). ....	181
Figure 4.9 Real Effective Exchange Rate Index for the US, 1994-2013, (2010=100). ....	181
Figure 4.10 Real Oil Prices and Net Oil Exports .....	186
Figure 4.11 Saving and Investment in China .....	189
Figure 4.12 Gross Capital flows as a percentage of World GDP and US balance of payment.....	204
Figure 5.1 Summary of the arguments that links rising inequality to the crisis .....	215
Figure 5.2 Comparison of Labor Productivity Growth and Real Wage Growth, 1959-2005 (1959 = 100) .....	218
Figure 5.3 Compensation of Employees as a percentage of GDP .....	220
Figure 5.4 Adjusted wage share in major economies .....	221
Figure 5.5 Top Income Shares for the US, 1913-2011 .....	222
Figure 5.6 Consumption and Residential Investment as a percentage of GDP .....	224
Figure 5.7 Real Wage and Productivity in the US manufacturing, 1890-2007. ....	228
Figure 5.8 Net Private Nonresidential Fixed Investment as a percentage of Net Private Nonresidential Fixed Assets, US, 1929-2011 .....	233
Figure 5.9 US Nonfinancial Corporate Sector Gross Saving, Capital Spending, Net Lending/ Borrowing, Gross Operating Surplus and After-tax, after-interest payments Profits (as a percentage of GDP) .....	235
Figure 5.10 The rate of accumulation and the rate of retained profits (undistributed profits) for the US non-financial corporate sector, 1952-2009.....	238
Figure 5.11 Share of dividends in after-tax profits in the US financial and non-financial corporate sectors, 1958-2009 .....	239

Figure 5.12 Capacity Utilization Rate in the US, 1967-2012 .....	240
Figure 5.13 Fluctuations of actual capacity utilization rate according to two different trend measures .....	241
Figure 5.14 The path of profit rate in the US, 1949-2005, by David M. Kotz. ....	243
Figure 5.15 Gross Private Domestic Fixed Investment Share (as a percentage of GDP), 1990-2010 .....	249
Figure 5.16 Net Private Fixed Investment as a percentage of Net Private Fixed Assets, US, 1990-2010.....	249
Figure 5.17 Total household debt and Mortgage debt as percentage of GDP .....	256
Figure 5.18 Growth of Hedge Funds and Demand Composition of CDOs .....	258
Figure 5.19 Changes in Bank Loans and Changes in Income Share of top 1 percent of income earners in the US, 1970-2008.....	260
Figure 5.20 The rate of profit-of-enterprise in the US, 1947-2008, by Anwar Shaikh.....	265
Figure 5.21 Decomposition of capital productivity growth rate for the US, 1966-2010. ....	272
Figure 5.22 Alternative Decomposition of Capital Productivity growth rate for the US, 1947-2010 .....	273

## LIST OF ABBREVIATIONS

ABCP	Asset-Backed Commercial Paper
ABS	Asset-Backed Security
ARM	Adjustable-Rate Mortgage
BHC	Bank Holding Company
CDO	Collateralized Debt Obligation
CDS	Credit Default Swap
CMO	Collateralized Mortgage Obligation
CPI	Consumer Price Index
CRA	Community Reinvestment Act
EU	European Union
FDI	Foreign Direct Investment
FRM	Fixed-Rate Mortgage
GDP	Gross Domestic Product
GSE	Government-Sponsored Enterprise
GSG	Global Saving Glut
ISDA	International Derivatives and Swaps Association
IMF	International Monetary Fund
MBS	Mortgage-Backed Security
MC	Mortgage Company
SIFMA	Securities Industry and Financial Markets Association
OECD	Organization for Economic Co-operation and Development
OPEC	Organization of the Petroleum Exporting Countries
OTC	Over-the-counter
PCE	Personal Consumption Expenditure
SEC	Securities and Exchange Commission
SIV	Structured Investment Vehicle

SPE	Special Purpose Entity
SPV	Special Purpose Vehicle
UK	United Kingdom
US	United States

## **CHAPTER 1**

### **INTRODUCTION**

The 2007/08 crisis was the most severe, system-wide and global crisis since the Great Depression of the 1930s. In a comparison with the crisis of 1929 that paved the way for the Great Depression, Romer (2009) shows that the shocks that shake the financial system and the economy was even greater in the recent crisis, when they are measured by the impact on household wealth, volatility in asset prices and credit spreads. Considering its global reach, the crisis of 2007/08 affected especially advanced countries by hitting their financial systems. Figure 1.1 below shows that while European Union, the US and Japan witnessed severe recessions in 2009, China was affected less by the crisis, pulling the group of developing East Asia and Pacific countries up. It can be fair to say that a part of the world economy still struggles with the remains of the crisis. Many European countries have stuck into stagnation after the crisis of 2007/08 transformed into government debt crises for some countries. The US Federal Reserve has maintained “quantitative easing” programs for years and has not got a chance to abandon yet.

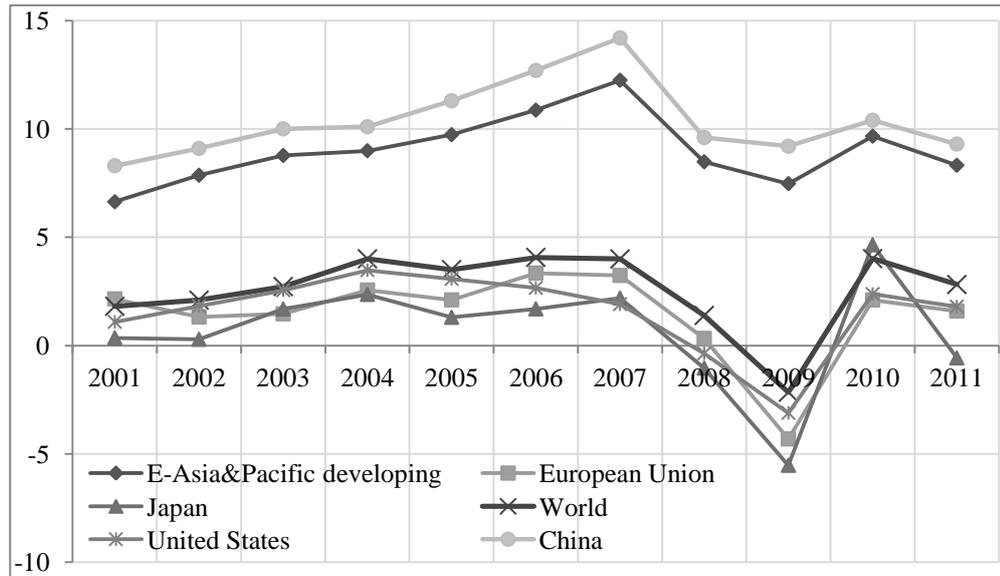


Figure 1.1 GDP growth rates for selected countries, country groups and the world, 2001-2011

Source: The World Bank Database.

Moreover, the social cost of the crisis became proportionate to its extent and depth. When we look at only unemployment-related figures, lasting effects of the crisis can be seen sharply. In Figure 1.2 below, all panels show that especially the US and European Union countries have faced sharp and long-lasting unemployment, long-term unemployment, which refers to continuous periods of unemployment among unemployed people, and youth unemployment after the crisis. Moreover, during the crisis years, governments spent huge amounts of money for bailout operations and for accelerating the recovery process. According to Özatay (2011a), the share of recovery packages reached 13 percent of GDPs in average for G-20 countries in 2009. The cost of these packages brought about extra burdens on taxpayers, workers, especially public servants in many countries with the implemented austerity measures.

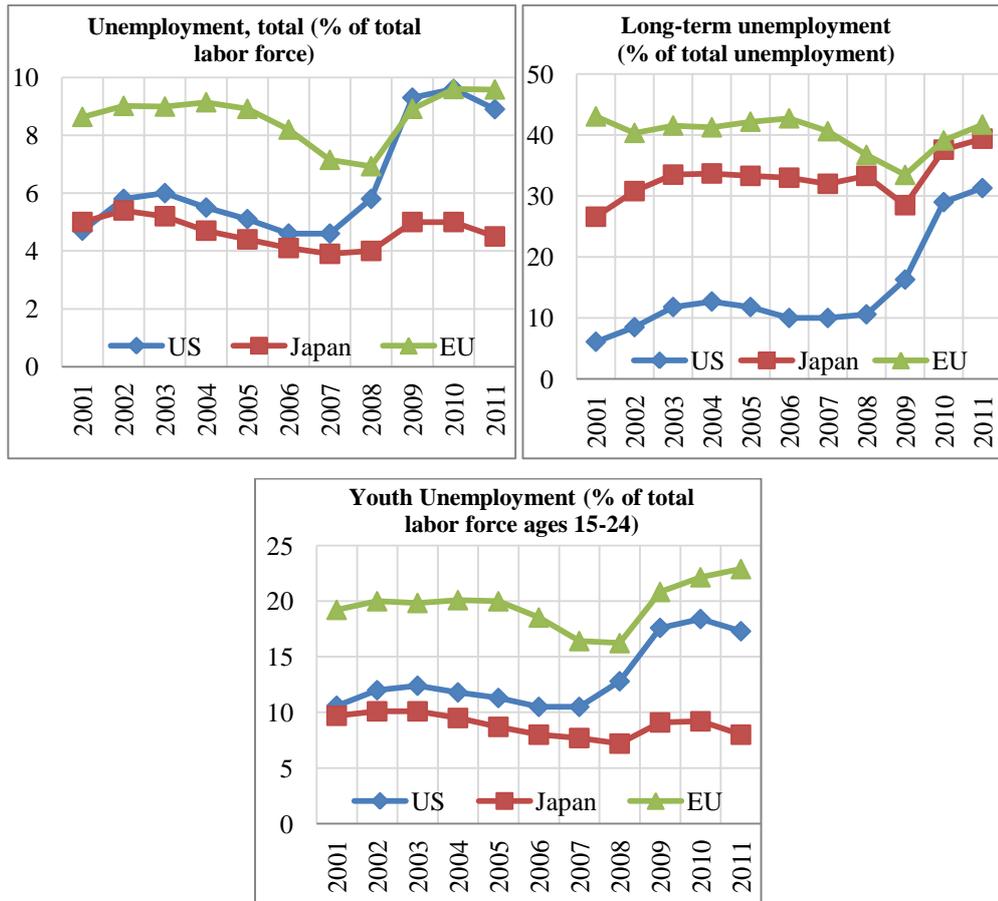


Figure 1.2 Unemployment, Long-Term Unemployment and Youth Unemployment in the US, European Union and Japan, 2001-2011.

Source: The World Bank Database.

This crisis brought about intensive research and debate over the causes of the crisis, mostly because traditional measures against the crisis could not help solve the problems. For example, Mishkin (2010: 11) states that “[t]he Federal Reserve’s modus operandi during the financial crisis can be characterized by saying that the Fed was engaged in massive experimentation in an unprecedented situation: that is, it was employing a large number of measures to contain the crisis, not knowing exactly which ones would work.” In addition, economists attempted to understand the causes of the crisis because it matters for taking precaution against future crisis, new regulations and policy implementations. Nonetheless, after three years the crisis hit, “The Squam Lake Report” authors, fifteen very famous economists, some of whom

even have written influential studies on the causes of the crisis, stated that “we believe our recommendations will help prevent or mitigate future crises even though we do not fully understand all the causes of the last one.” (French et. al., 2010:16). These examples imply that despite vigorous efforts, there have remained many puzzles waiting for solution about the crisis.

The aim of this thesis is to comprehend the causes of the recent crisis in a coherent way by exploring and analyzing the literature about the causes of the crisis. We think that besides practical concerns about the causes of the crisis, understanding them are important for historical lessons, for envisaging the future of capitalism and for improving economic theories, which, in turn, would help practical solutions.

The crisis of 2007/08 did outburst in the US, the center of capitalist world economy, and in the financial centers of the European economy at the same time, then spreading all over the world with its all devastating consequences in two years. The outbreak of the crisis in the US was at the end of a boom-bust cycle correlated with a housing price boom. Since the hurricane broke out in the US, most scholars firstly focus on the malfunctions in the US economy. Initially, it was called as “subprime mortgage crisis”, referring to the problems that precipitated the crisis. After September 2008, when “Lehman Brothers”, the fourth largest investment bank of the US, went into bankruptcy and when devastating effects of the financial crisis were felt harshly in the real sector, it was called as “the Great Recession”. The US financial system was the epicenter of many events, considering the evolution of the crisis from triggering events to striking instants of failures at its last stages. Thus, we focus on the developments in the US while searching for the causes of the crisis.

Our main questions will be as follows: what were the underlying causes of the housing boom and bust cycle in the US? How could a cycle make such harm for the global economy? Was there any role for the international developments of the recent period in these explanations, such as global imbalances? Or was there any role for the monetary policy stance of the Federal Reserve? Why the US policymakers could not prevent such a disaster, or could they prevent it? What was the role of financial system and regulatory framework of the US in the build-up of financial

vulnerabilities? How did the crisis bound to the patterns and results of neoliberal policies and the inner mechanisms of capitalism?

Although the main aim here is to comprehend the causes of the crisis in a coherent way, we do not directly investigate the causes of the crisis or the foregoing questions in every case. On the circumstances and causes of the recent global crisis, there exist many explanations from different perspectives, backgrounds and theories, and the literature over the crisis is still continuing to grow. In this thesis, we rely on a part of this literature in order to understand both causes of the crisis and the prominent arguments that have been presented up to now. At first, we separate these explanations into four subheadings according to their central emphasis; accordingly, they are financial system-related explanations, in which innovations, regulatory problems and incentives are focused on; monetary-policy-based explanations; global-imbalances-based explanations, and finally long-term structural-problems-based explanations. In the second chapter, relying on the arguments that make case for the contribution of the components of financial system to the crisis, we argue that financial system-related explanations to the crisis explain much of the story about the crisis. Then, we analyze other explanations elaborately and quest for the validity of these explanations with theoretical, analytical and empirical concerns. In the end, we draw conclusions about their explanatory power and their significance in explaining the crisis. At the last stage, bringing all these conclusions together, we try to make a synthetic explanation for the causes of the crisis.

There are three main contributions of this thesis to the literature about the causes of the crisis. Firstly, to the best of our knowledge, although there are many personal accounts or subject-based critics in the literature, there is not any study that brings many explanations together and presents their pros and cons in a coherent way. Although Evans (2010) analyzes the explanations about the crisis with a more or less similar structure to that of us, his work is also a short personal account, which does not elaborately focus on the arguments and empirical works<sup>1</sup>. Secondly, this work

---

<sup>1</sup> Evans (2010) analyzes the other interpretations under five headings, splitting incentives-based and financial innovation- and deregulation-based explanations in different parts, rather than four headings.

covers a vast literature about the causes of the crisis and provides details about several influential studies, so it builds a base for future studies. Thirdly, it gives detailed critics about some of the common-views. In many personal accounts, easy monetary policy stance of the Federal Reserve and international capital flows are counted as the causes of the build-up of financial vulnerabilities and housing boom of the US, thence as contributing factors to the recent global crisis, although many of these personal accounts do not directly focus on these factors. However, our detailed and critical literature review implies that these two factors had little to do with the causes of the crisis.

The plan of this study is as follows. The second chapter focuses on the possible problems that can be related to the financial institutions and mechanisms. It, first, provides a summary of the important events that occurred during the 2007 and 2008 periods and focuses on the very proximate causes of the crisis that give suggestive information about the timing, contagion dynamics and severeness of the crisis. Then, this chapter analyzes how and how much financial innovations, regulations, incentive structures and self-reinforcing feedback mechanisms of the financial system contributed to the build-up of financial vulnerabilities and housing boom under four subheadings. Our discussion on these matters shows that, at first, four financial innovations or new financial practices, which are securitization, credit derivatives, off-balance-sheet vehicles of large banks and growing financial investment activities that relied on wholesale funding markets, has severely contributed to housing boom and bust, to the amplification of the problems during the crisis and to the creation of significant vulnerabilities in the balance-sheet of large financial institutions. Secondly, we show that self-reinforcing feedback mechanisms of the boom and bust periods started to become more influential on the financial markets and real economy and they seem also as the most influential factors on the amplification mechanisms of the crisis. Thirdly, we show that perverse incentives of the financial agents that arisen from some common financial practices, regulations or legislations were very likely to exacerbate some of the excesses during the financial boom periods. Finally, we show that several regulation and supervision inconsistencies and failures seem to be highly related with the proximate causes of

the recent crisis. All in all, we argue that gradual financial liberalization process of the last three decades seems as the most significant underlying causes of the crisis.

The third chapter focuses on monetary policy- based explanations. By focusing mostly on a specific discussion that hover around the arguments and findings of John Taylor (2007, 2009), this chapter essentially check that whether the monetary policy stance of the Fed had any role in determination of mortgage interest rates and housing price boom during the 2000s. Historically low levels of interest rates and unprecedented rise in housing prices were likely to be linked to proximate causes of the crisis. Since it is expected that monetary policy affects these indicators, the outcomes of monetary policy on them are worth to study. After discussing how and how much monetary policy stance of the Federal Reserve (Fed) affected these variables, we conclude that monetary policy stance of the Fed does not seem effective on mortgage interest rates and housing price developments during the 2000s. However, this chapter does not try to cover all possible contribution channels of monetary policy to the crisis. Nonetheless, some other empirical findings that touch upon the role of monetary policy through different channels in other chapters reinforce conclusions of this chapter.

The fourth chapter focuses on the ideas that relate the crisis with global current account imbalances. By focusing on the widespread interpretation of global imbalances, which is global excess saving view, we quest for the following claim: net capital flows (as the reflection of global current account imbalances) that resulted from relatively excess saving of some of the developing countries, particularly of China, caused falling down of long-term interest rates in the advanced countries and contributed to housing boom and the build-up financial vulnerabilities, such as high-leverage, excessive risk-taking, rising asset prices and so on. First, we analyze and criticize theoretical framework of the excess saving view and its implications on the role of developing countries in the build-up of financial vulnerabilities in the US. Secondly, focusing on the empirical literature that does not exclusively rely on the excess saving view, we analyze whether there was any role for net capital flows among the causes of the crisis. Although this literature point out several important

linkages between global imbalances and the crisis, we argue that both global imbalances and the crisis can be a consequence of the financial deregulation process and effective financial innovations. This argument is opposed to those that propose a causality running from global imbalances to the crisis. Moreover, when gross capital inflows, a better measure of international financial activities, are taken into consideration instead of net capital flows (global imbalances), it is clearly seen that the implications of global-imbalances-explanation of the crisis on the role of developing countries are exaggerated. Gross capital flow analysis for the US shows that the international source of the financial vulnerabilities in the US was predominantly advanced European countries. Both of our critical stances against the implications of empirical literature imply that the main problem of global-imbalances- explanations is the misdirection about the main sources of global financial flows.

The fifth chapter focuses on the ideas that relate the crisis with structural problems of the US economy in the neoliberal period or the structural problems of capitalism, in general. Firstly, we analyze the arguments that point out increasing inequality and inadequate aggregate demand as the fundamental structural causes of the crisis. Analyzing the implications of this view, we show that many of the implications of this argument do not match with the real sector patterns we observed for the last three decades. These mismatches, on the other hand, are explained by some financial phenomena of the recent decades, such as increasing household borrowing, asset bubbles and credit booms, arguing that those phenomena are caused by increasing inequality. Again, we show that a part of these arguments is also weak. Moreover, we discuss and criticize the way these arguments followed and their ascription of a secondary and functional role to financial sector developments. Secondly, we focus shortly on the arguments that point out long-term profitability patterns as the main underlying cause of the recent crisis. We show that some of these interpretations have also similar problems to that of inequality-based explanations. Moreover, the long-term profit rate patterns could not be linked to the financial characteristics of the recent crisis. In this sense, the recent crisis was not a profitability crisis. Nonetheless, we argue that there may still be a role for

profitability in the explanation of the deepness of the recession and post-crisis stagnation.

Finally, in the concluding chapter, composing our main conclusions from the previous chapters, we will give a short account for the crisis and draw our concluding remarks.

## **CHAPTER 2**

### **FINANCIAL SYSTEM AND THE CRISIS**

The crisis literature has discussed different aspects of financial problems that possibly contributed to the crisis. These include the role of financial innovations, new practices, regulations and supervision problems, incentive problems and self-reinforcing mechanisms of financial booms and busts. Different interpretations gave different weights to these components. We will analyze the role of financial developments under four headings focusing on some of the prominent views under each heading.

In this chapter, firstly, we discuss and argue that securitization, credit derivatives, off-balance-sheet vehicles of large banks, and finally, growing financial investment activities that relied on wholesale funding markets were the most prominent financial innovations or new financial practices that could explain the characteristics of the crisis. Partly related with these innovations and partly related with other developments, self-reinforcing feedback mechanisms of the boom and bust periods started to become more influential on the financial markets and real economy. In our view, these mechanisms seem as one of the most influential factors on the evolution of the boom and the crisis. What is more, we argue that these mechanisms explain much of the depth of the financial crisis. Besides, perverse incentives of the financial agents were criticized severely after the crisis. They were very likely to exacerbate some of the amplification mechanisms, but, arguably, perverse incentives were unleashed or consolidated by new financial practices and

regulatory arrangements. Finally, several regulation and supervision activities seem to be highly related with the proximate causes of the recent crisis.

Financial markets have become all the more complex and financial companies have become all the more giant after the 1980s. During the last three decades, the US economy, several advanced economies and developing economies, all have witnessed many financial crises; in turn, these crises have required many bailouts and financial reforms. Although a general interpretation to these financial crises is not our duty in this thesis, nonetheless, it seems reasonable to link these crises to financial liberalization and its products. Accordingly, it can be argued that the recent crisis was also the product of financial liberalization. Indeed, after analyzing four components of the financial problems that explain bulk of the story of the recent crisis, we argue that gradual financial liberalization process of the last three decade was one of the most significant underlying causes of the crisis.

The recent global crisis started with the emergence of problems in subprime mortgage market. Increasing delinquency rates of subprime mortgages created vulnerabilities in the financial system and paved the way for the outbreak of the crisis. Nonetheless, subprime mortgage market was so small relative to size of global financial markets and the severeness of the crisis is compared with the one that precipitated the Great Depression. Therefore, it is natural to think over the evolution of the crisis from subprime collapse to financial crisis. Before going into details about main arguments of this chapter, we will analyze what characterized the crisis in two parts. We will clarify how subprime mortgage collapse turned into a financial crisis. Also, in doing so, we will introduce the problems that will be elaborated on later. In the end, we will show that four aspects of financial problems explain much of these characteristics.

Accordingly, the structure of this chapter is as follows: first, the characteristics of the crisis will be analyzed. Secondly, the arguments on the role of financial innovations will be discussed, especially focusing on the securitization. Thirdly, we will discuss the importance of leverage and self-reinforcing feedback mechanisms of finance. Fourthly, how some of the perverse incentives were emerged and how they

contributed to financial vulnerabilities will be discussed. Fifthly, we will summarize and discuss some views that point out the linkages between financial vulnerabilities and regulation and legislation processes. Finally, conclusions will be drawn.

## **2.1. Characteristics of the Recent Crisis**

In this section, we outline the proximate causes or events, according to the literature that proposed various chains of causality, but indicated more or less same proximate events. The aim of this part is to clarify how subprime mortgage collapse turned into a financial crisis and how these characteristics can be linked to the underlying causes of the crisis with regard to financial developments. According to the chronology of the events<sup>2</sup>, worsening conditions in the subprime mortgage market takes the first place. Then, starting with the summer of 2007, first signals of a systemic crisis started to be appeared as the conditions in short-term borrowing markets worsened and central banks started to intervene in financial markets by injecting liquidity. During 2007 and 2008, worsening conditions in short-term borrowing markets and runs on wholesale borrowing markets (such as repo market and asset-backed commercial paper market) and runs on money market mutual funds after the Lehman collapse were turning points in the recent crisis, which needs to be analyzed carefully to understand the reasons behind the crisis. Accordingly, first, we will look closer to the collapse of subprime mortgage markets. Secondly, we will analyze the ingredients that brought financial sector to the brink of collapse.

### **2.1.1. Subprime Mortgage Collapse**

Starting with 2006 and accelerating with the first months of 2007, large financial firms that specialized in mortgage finance, especially in subprime mortgage finance encountered hard conditions<sup>3</sup>. According to Sinn et al (2009)'s summary of events,

---

<sup>2</sup> Sinn et. al. (2009), in chapter 2 of "EEAG Report on the European Economy, 2009", gives a chronology of the events that we will mostly draw on.

<sup>3</sup> As Green (2007) listed at a very early date, in August 23, 2007, with the shutdown of Lehman Brothers' subprime lending unit, the number of "mortgage companies that have halted operations or sought buyers since the start of 2006" reached to at least 100.

in the first half of 2007, all events were related with the deteriorated conditions in mortgage finance sector: disclosure about mortgage-related losses by HSBC, cease-and-desist order for a subprime lender company issued by Federal Deposit Insurance Corporation, sanctions against a large subprime lender that finally went into bankruptcy, and other following bankruptcies in this sector, the close-up of subprime lending arms by the largest banks, such as UBS, and the largest corporations, such as General Motors and General Electric, and finally wounded hedge funds as a result of the decline in the prices of their investments in subprime related assets. Also, during the same period, several bad news about the future of construction activities and disclosure of the data about housing sector (fall in housing starts and housing sales) revealed gradually worsening conditions in the housing sector<sup>4</sup>.

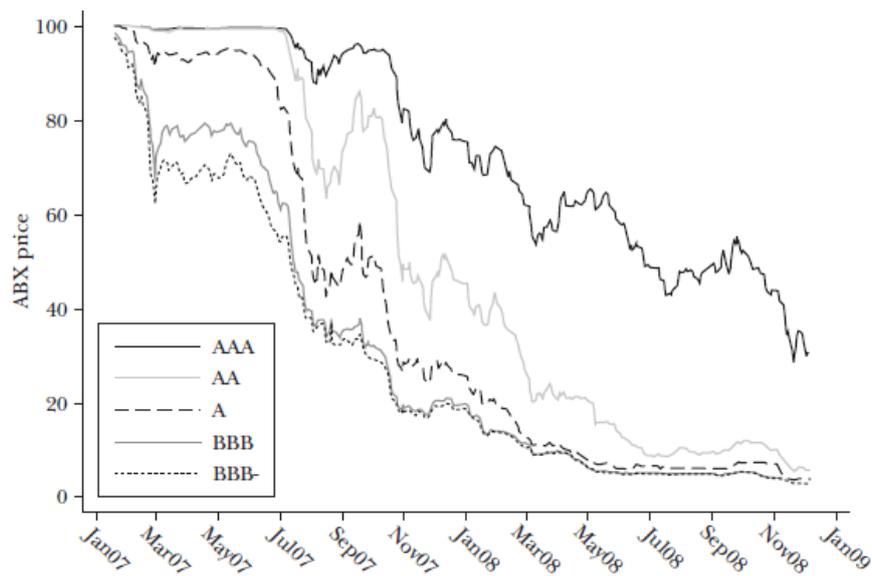
In line with the timeline of important events, findings of Gorton and Metrick (2010) on the characteristics of the crisis also confirm the importance of losses in subprime-related markets. They show that the first half of 2007 was ordinary for majority of fixed-income assets (including auto loans, credit card receivables, corporate loans, and even most of the mortgage-related assets) except for those subprime-specific ones with the lowest investment grade. Using an ABX spread index of subprime-related assets as an indicator, they argue that troubles in subprime-related assets began to appear during the first few months with its increase from 153 basis points that is close to historical average to 552 basis points in March<sup>5</sup>. Moreover, they find that the ABX spread showed a steady rise during the turbulent years of 2007-2008, reaching 9000 basis points in the second half of 2008. However, their findings also imply that weakening of subprime markets “was not the shock that caused systemic problems”, but set the stage for it (Gorton and Metrick, 2010: 29). Similarly, Brunnermeier (2009), who looks closer to the characteristics of the crisis,

---

<sup>4</sup> “The National Association of Realtors announces that existing home sales fell 8.4% during March, the greatest drop in 18 years” in April, 2007 and in July, 2007, it is revealed that “US housing starts down 20% from the previous year” (Sinn et al., 2009: 108).

<sup>5</sup> Gorton and Metrick (2010: 14-15) states that ABX index is a credit derivative that references subprime residential mortgage-backed securities and gives information about the value of subprime mortgages, hence, gives information about housing prices. They take an ABX as referring to the riskiest segment of subprime mortgages and an increase in ABX spread means that housing prices fall.

take the depreciation of subprime mortgage related assets as the trigger of upcoming storm, showing the movement of ABX indices for differently-rated classes of asset-backed securities involving subprime mortgages (See Figure.2.1). As shown by the figure below, and also supported with econometric analysis of Gorton and Metrick (2010) for a various class of assets, during the first half of 2007, only the lowest grade subprime-related assets gave distress signal.



Source: LehmanLive.

Note: Each ABX index is based on a basket of 20 credit default swaps referencing asset-backed securities containing subprime mortgages of different ratings. An investor seeking to insure against the default of the underlying securities pays a periodic fee (spread) which—at initiation of the series—is set to guarantee an index price of 100. This is the reason why the ABX 7-1 series, initiated in January 2007, starts at a price of 100. In addition, when purchasing the default insurance after initiation, the protection buyer has to pay an upfront fee of  $(100 - \text{ABX price})$ . As the price of the ABX drops, the upfront fee rises and previous sellers of credit default swaps suffer losses.

Figure 2.1 Movement of ABX indices for differently rated classes of subprime related ABSs

Source: Brunnermeier (2009: 83).

The deterioration in the value of subprime related assets reflected most probably deteriorated conditions in this market from 2006 onwards. The proximate cause of the worsening conditions in subprime mortgage markets was most probably the

increase in delinquency and foreclosure rates in residential loans and especially in subprime residential loans, both of which started their destructive movements in the preceding years of the crisis, in 2005 and 2006 (see Figures 2.2 and 2.3). The national-level figures about subprime mortgage defaults are supported with micro-level data in Mian and Sufi (2008). They show that subprime borrower neighborhoods witnessed three times more defaults than that of prime borrower neighborhoods throughout the country<sup>6</sup>.

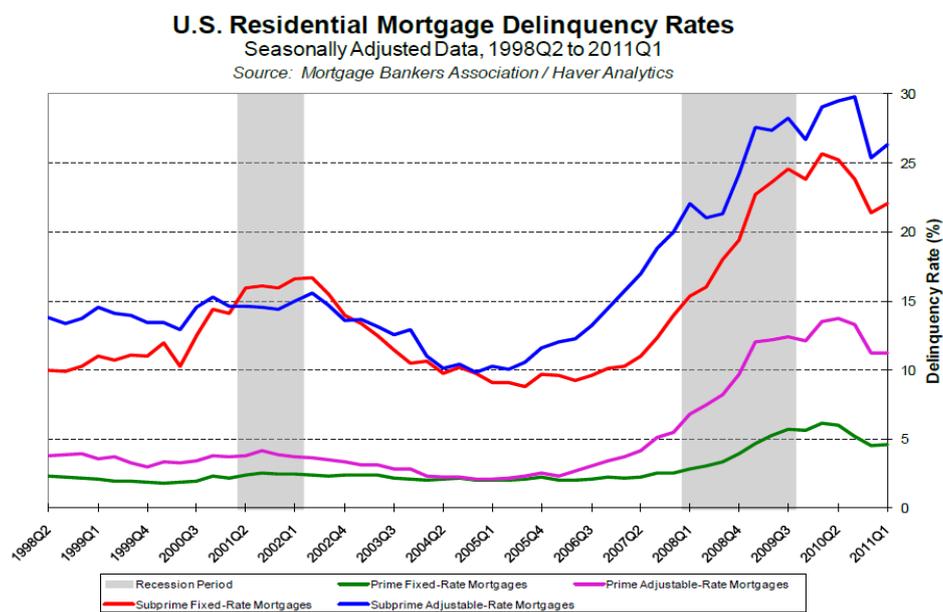


Figure 2.2 US Residential Mortgage Delinquency Rates

Source: Federal Reserve Bank of Richmond.

<sup>6</sup> They stated that “[a] comparison of subprime and prime zip codes, which are defined to be zip codes in the highest and lowest quartile based on the fraction of borrowers with a credit score under 660 as of 1996, reveals that subprime zip codes experience an increase in default rates since 2006 that is more than three times as large as prime zip codes in the same metropolitan area ... Moreover, the unprecedented growth in subprime credit is not a regional phenomenon; instead, it exists in almost every metropolitan area of the United States” (Mian and Sufi, 2008: 1). We should note that national-level figures display the path of defaults in subprime mortgages, but Mian and Sufi (2008) focus on defaults related with subprime borrowers, not subprime mortgages. One should be careful about the distinction between subprime mortgage and subprime borrowers. “Subprime borrowers can obtain non-subprime mortgages and prime borrowers can obtain subprime mortgages” (Mian and Sufi, 2008: 10). “Subprime mortgages went to all kinds of borrowers, not only to those with impaired credit ...[but] [s]pecifically, if a loan was given to a borrower with a low credit score or a history of delinquency or bankruptcy, lenders would most likely label it subprime” (Demyanyk, 2009).

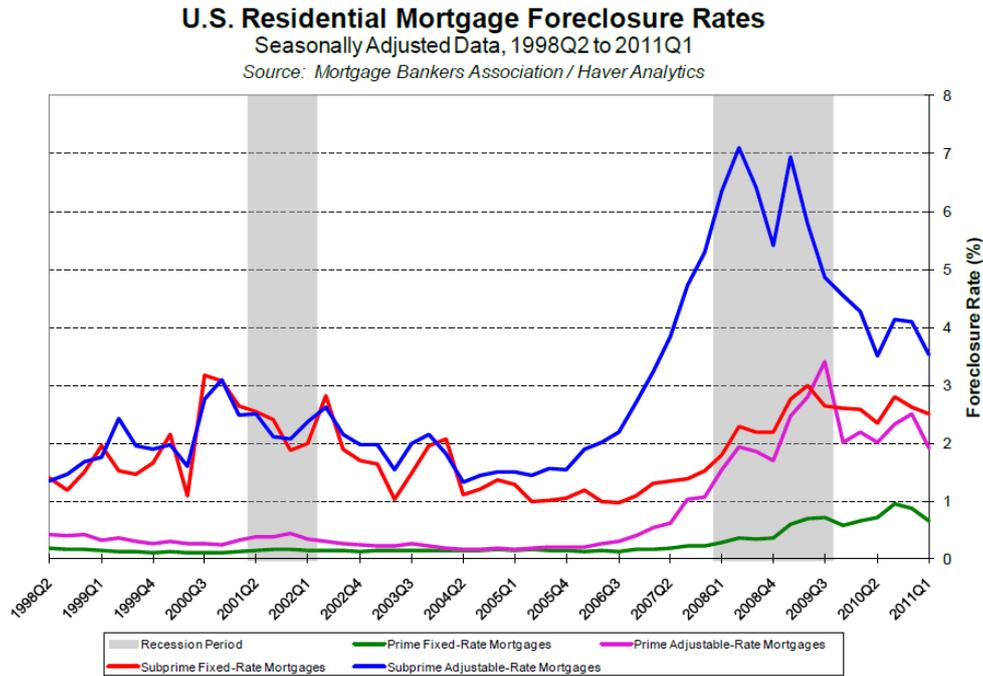


Figure 2.3 US Residential Mortgage Foreclosure Rates

Source: Federal Reserve Bank of Richmond.

Thus, several questions arise: what were the driving forces of this increase in subprime defaults exactly at that time? Why it was specific to first and foremost subprime defaults? As we will mention in the subsequent chapter, some points out the channel of tightening monetary policy, the resulting decline in demand for housing, stagnating housing prices and rising defaults (e.g. Taylor, 2007). Some also points out the special role of ARMs (adjustable-rate mortgages), as the most sensitive mortgage types to monetary policy (e.g. Zywicki, 2009; O’Driscoll, 2009). On the counterpart, critics of monetary-policy-related explanations point out the decline in housing prices as the trigger of events, but not the tightening of monetary policy, of course (e.g. Bernanke, 2010a; 2010b). Many of those who are not directly participated in the monetary policy discussion also argue that decline in house prices increased mortgage defaults and triggered the systemic crisis. A part of the literature attributes the housing price acceleration to global current account imbalances and accompanying net capital flows (e.g. Bernanke, 2010a, Obstfeld and Rogoff, 2009).

Nonetheless, as we will discuss, global imbalances do not explain deceleration of housing prices in 2006. On the other hand, many arguments do not directly focus on the determinants of housing price acceleration and deceleration, but we can count four dynamics that would possibly be the underlying causes of housing price boom and bust, according to the literature. These are easy monetary policy, global imbalances, a kind of “irrational exuberance” (e.g. Greenspan, 2010a), and finally, financial innovations and deregulations that related with mortgage markets. In the next chapter, we will show that monetary policy stance was a weak explanatory of the recent housing boom. The findings of this chapter will further reinforce this view. In the fourth chapter, we will show the weaknesses of “global imbalances” view. Therefore, in this chapter, among other questions, we deal with the question about the relative contributions of “irrational exuberance” and financial innovations and regulations to the housing boom. We will argue that the contribution of the latter one prevails.

When we look at the peak of the housing boom, we see that the start of stagnation in housing prices coincides with the start of decline in delinquency and foreclosure rates (see Figure 2.4). In the first quarter of 2006, housing prices reached at peak and subprime mortgage defaults shot up roughly at the same time. In an early study, Doms et. al. (2007), focusing only on the link between house price acceleration and subprime delinquency rates for 2005 and 2006, argue that subprime delinquencies and house price acceleration have high negative correlation (- 0,79) for the largest 150 MSAs (Metropolitan Statistical Areas) in the US. Changes in the subprime delinquency rates and changes in the pace of house price acceleration are also negatively correlated (- 0.61). They propose that stagnation of house price appreciation might have increased subprime delinquencies through narrowing incentives and opportunities of homeowners about protecting home equity and changing the expectations about house price movements. Besides, national-level data in foreclosure rates seems as supportive to ARM-based view, but delinquency rates seem less supportive in this sense, because both FRMs (fixed-rate mortgages) and ARMs started to rise at the same time (see Figure 2.2 and 2.3 above).

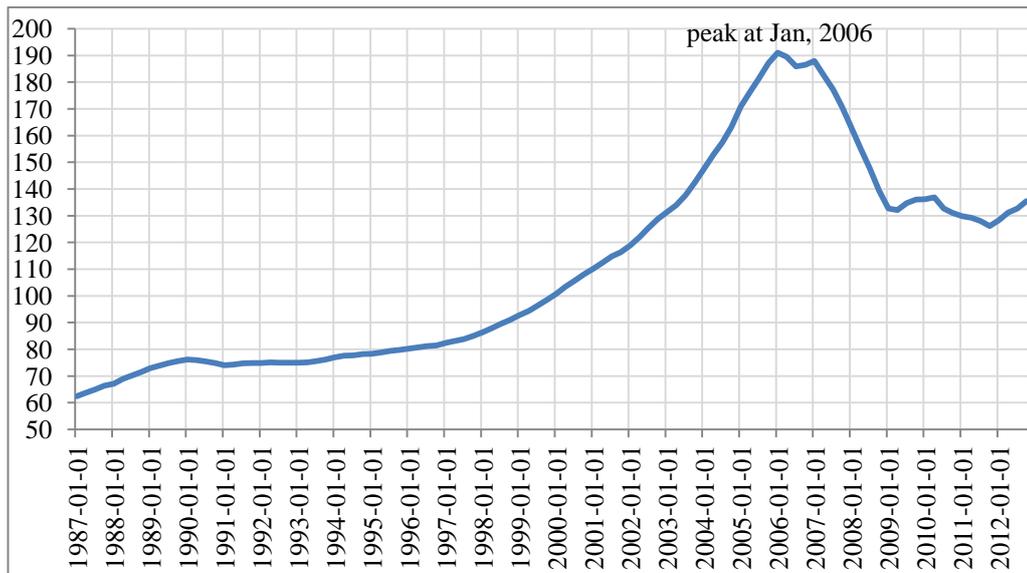


Figure 2.4 National Composite Home Price Index for the US

Source: Federal Reserve Bank of St. Louis

Notes: Seasonally adjusted and quarterly data. Index 2000 Q1 = 100.

On the other side, there are much more detailed analyses on the determinants of housing prime boom and bust, so they have different implications on the origins of it. Firstly, on the different rate of defaults of fixed-rate (FRM) and adjustable-rate (ARM) mortgages, Demyanyk (2009) puts a strong counter-argument, stating that since these views based on the data about the defaults of the aggregate of loans originated in different years, as in Figures 3.2 and 3.3, they conceal the roots of the problems. Her findings imply that since older loans performed better and newer ones performed worse, and the fraction of FRM origination declined during the housing boom, the aggregate data led to erroneous conclusions. She supports the argument by comparing the default rates of FRMs and ARMs by the year of origination and finding that “FRMs originated in 2006 and 2007 had 2.6 and 3.5 times more delinquent loans within one year of origination, respectively, than those originated in 2003. Likewise, ARMs originated in 2006 and 2007 had 2.3 times and 2.7 times more delinquent loans one year after origination, respectively, than those originated in 2003. In short, FRMs showed as many signs of distress as did ARMs.” Secondly, on the link between housing prices and mortgage defaults, there are also critical

approaches. For example, Demyanyk (2009) argues that “the decline in home values only revealed the problems with subprime mortgages; it did not cause the defaults”<sup>7</sup>. Besides, several studies point out gradually declining lending standards during the 2000s as one of the most important factor behind the collapse. Also, Geanakoplos (2010: 110), who propose the “leverage cycle theory” that will be discussed in the subsequent sections, states that “[m]any commentators have traced the beginning of the subprime mortgage crisis to falling housing prices. But they have not asked why housing prices started to fall. Instead, they have assumed that housing prices themselves fueled on the way up by irrational exuberance and on the way down by a belated recognition of reality, were the driving force behind the economic collapse. I see the causality going in the other direction, starting with the turnaround in the leverage cycle”. Finally, Mian and Sufi (2008) propose the possibility of a shift in mortgage supply, in part due to securitization, which might have caused both subprime mortgage growth and house price acceleration in the 2000s. They also provide several arguments that weaken the role of interest rates and macroeconomic conditions on the recent housing boom. Moreover, considering the overlapping of the rapid rises of mortgage debt outstanding and financial innovations related with mortgage sector especially after the mid-1990s (See Figure 2.5), it is reasonable to argue that beyond the macroeconomic conditions of the 2000s, the seeds of the housing boom might have been sown by financial innovations and deregulations of the 1990s. Finally, as we will discuss in the fifth chapter, the outbreak of the subprime collapse was related partly with increasing inequality, increasing debt service burden on low- and middle- income groups.

---

<sup>7</sup> Demyanyk (2009) states that “[r]esearch shows that the quality of newly originated mortgages was worsening every year between 2001 and 2007; the crisis was brewing for many years before house prices even started slowing down. But because the housing boom allowed homeowners to refinance even the worst mortgages, we did not see this negative trend in loan quality for years preceding the crisis.”

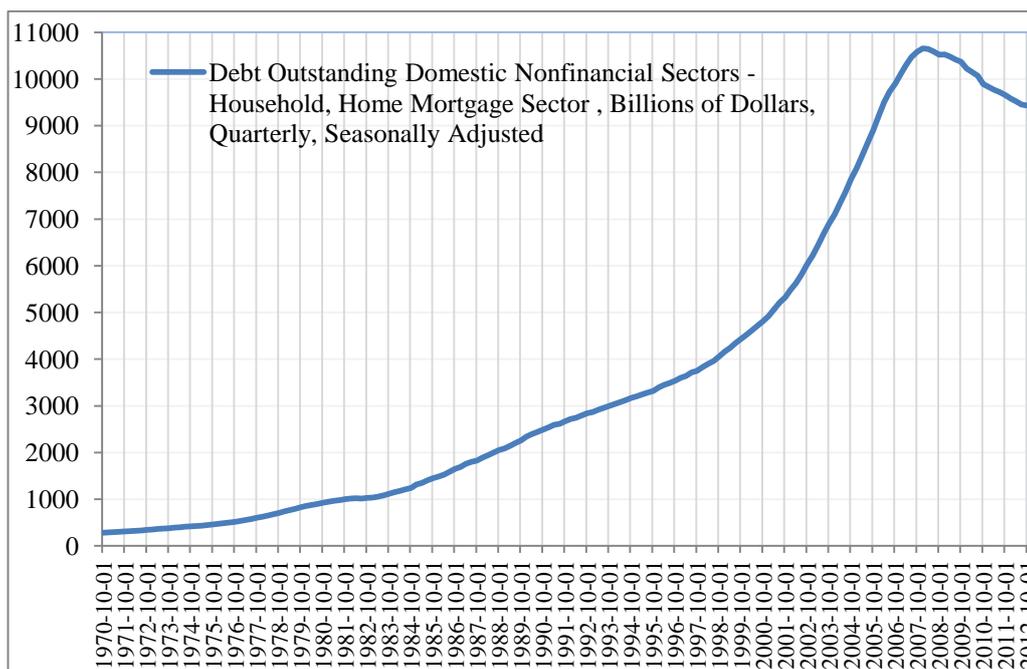


Figure 2.5 US Mortgage Debt Outstanding, 1970-2012

Source: Federal Reserve Bank of St. Louis

In sum, some evidence supports the link between the stagnation of housing prices and mortgage defaults, but some has criticism on the inadequacy of these explanations. Moreover, there are critics about the indicated causality and its implications about the deeper causes of the recent crisis. In general, most of the foregoing examples indicate possible financial system-related deeper roots of the subprime mortgage collapse and associated housing price deceleration. Such arguments in general put more emphasis on the relaxing lending standards, increasing leverage and financial innovations and regulatory environment. Indeed, we argue that they give much more insights to illuminate the causes of the recent housing boom and bust than monetary-policy-based explanations, global imbalances-based explanations or psychological factors. There are strong cases for the role of financial innovations, deregulation, household and financial sector leverage and credit boom in determination of housing price boom and bust, as we will show throughout the chapter. Indeed, one aim of this chapter is to analyze and show the validity of such arguments.

### 2.1.2. Constituents of the Financial Crisis

How could a relatively small market<sup>8</sup> pull the trigger of the crisis in huge global financial markets? This question is raised by many authors and the answer mostly lies in the accumulation of systemic risks. A closer look at the events of the final stage and understanding the contagion and amplification channels that are mostly related with short-term borrowing, declining asset prices and loss of confidence in financial markets will provide a basis for raising questions about the conditions that created this final stage, so the accumulation of systemic risks.

Many narratives point out August, 2007 as the date for the outbreak of a systemic crisis. According to Sinn et. al (2009)'s chronology, important events of these turbulent days include the followings: bankruptcies of subprime originators went on, hedge funds run by the largest investment banks became on the hook, BNP Paribas, a large bank, suspended the redemption of shares in three investment funds hit by subprime losses, the interest rate on 15-day AAA asset-backed commercial paper reached "6.14% for a historic high". The last two events possibly indicated a breaking point, because at that dates both asset-backed commercial paper market and interbank loans markets witnessed tightening of liquidity, and also the ECB (European Central Bank), the Fed, and the Bank of Japan started to provide liquidity into markets just after these events.

TED spread or LIB-OIS spread<sup>9</sup> are widely used as indicators of the instantaneous rupture in the financial markets. In Figure 2.6, we provide the path of

---

<sup>8</sup> "With more than \$1 trillion in subprime mortgages outstanding, the potential for losses on these loans was large in absolute terms; however, judged in relation to the size of global financial markets, prospective subprime losses were clearly not large enough on their own to account for the magnitude of the crisis. (Indeed, daily movements in global equity markets not infrequently impose aggregate gains or losses equal to or greater than all the subprime mortgage losses incurred thus far.)" (Bernanke, 2010b:1)

<sup>9</sup> Both of them follow the same logic. LIBOR (London Interbank Offered rate) is set in an interbank loan market, through which banks borrow very short-term, unsecured funds from each other. Therefore, it carries concerns about liquidity or counterparty risks<sup>9</sup> (Gorton and Metrick, 2010), so it is not a risk-free rate. On the other side, US Treasury bill (T-bill) interest rates or overnight index swaps (OIS) are considered risk-free interest rates. Thus, TED spread, which is the difference between LIBOR and T-bill rate, or LIB-OIS spread, which is the difference between LIBOR and OIS, give information about liquidity and counterparty risk problems in short-term funding markets.

TED spread for the recent crisis<sup>10</sup>. Before August, 2007, it displays stable trend at very low levels, but it rises rapidly in August 2007 and stays at relatively high levels with an unstable pattern during 2007 and 2008. Then, it soars again to the record high in September, 2008, at which Lehman Brothers went into bankruptcy and AIG is bailed out<sup>11</sup>.

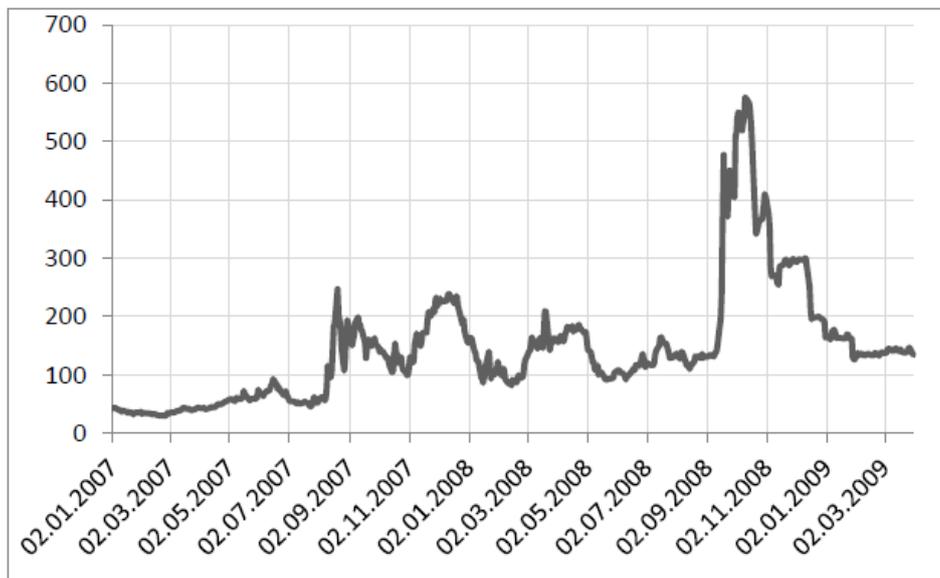


Figure 2.6 TED Spread

Source: The Federal Reserve System.

Note: It is calculated as the difference between LIBOR 3-month deposit rate and 3-month US T-bill rate.

<sup>10</sup> LIB-OIS spread also displays almost same movements, so we do not need it here.

<sup>11</sup> We should note that Gorton and Metrick (2010) separate the effects of liquidity and counterparty risks in the evolution of LIB-OIS spread and find that during the recent crisis, only counterparty risks explain the variations in LIB-OIS. Similarly, Taylor (2009) argues that LIB-OIS has little to do with liquidity risks in the recent crisis, but it has related with counterparty risks by showing a simple correlation between LIBOR–repo (repurchase agreement) spread (as examples of unsecured and secured debts) and LIB-OIS spread. This was seen important for two reasons. First, Taylor (2009) argues that since the problem was counterparty risk evaluation in financial markets, central banks should have stepped in considering this. Secondly, and most importantly for our concerns, this separation and findings in favor of counterparty risks give clues and supportive evidence about the causes of the contagion dynamics of the crisis.

Another indicator of a run on wholesale funding markets in August 2007 is the dry-up of Asset-Backed Commercial Paper (ABCP) markets. In Figure 2.7, we provide a plot for ABCP outstanding, which reaches at peak at August 8, 2007 and then sharply drops. This graph also provides a suggestive link between subprime collapse and the outbreak of the systemic crisis, since ABCP markets relied mostly on mortgage pools as collateral. In this respect, Bernanke (2010b) states that “[i]n midsummer 2007, events unfolded that would engender a sea change in money market conditions, triggered by fears of subprime losses that had been growing during the first half of the year ... [C]autious lenders pulled back even from those that likely had no exposure to subprime mortgages ... Short-term funding in the interbank market became more difficult and costly.” Also, Brunnermeier (2009) propose that since the credit rating agencies take those subprime related tranches into downgrade review, this raised concerns about valuing those structured products and eroded confidence in ratings; thus, these events paved the way for dry-up of funding liquidity in asset-backed commercial paper markets and interbank loan markets. Gorton and Metrick (2010:6) propose other channels for the effect of subprime collapse on the banking sector. They stated that “deterioration of the subprime market ... had a direct impact on banks, which had many of these securitized assets and pre-securitized mortgages on their balance sheets. This real deterioration in bank balance sheets became apparent in the interbank markets in mid-2007, as evidenced by an upward spike in the LIB-OIS in August.”

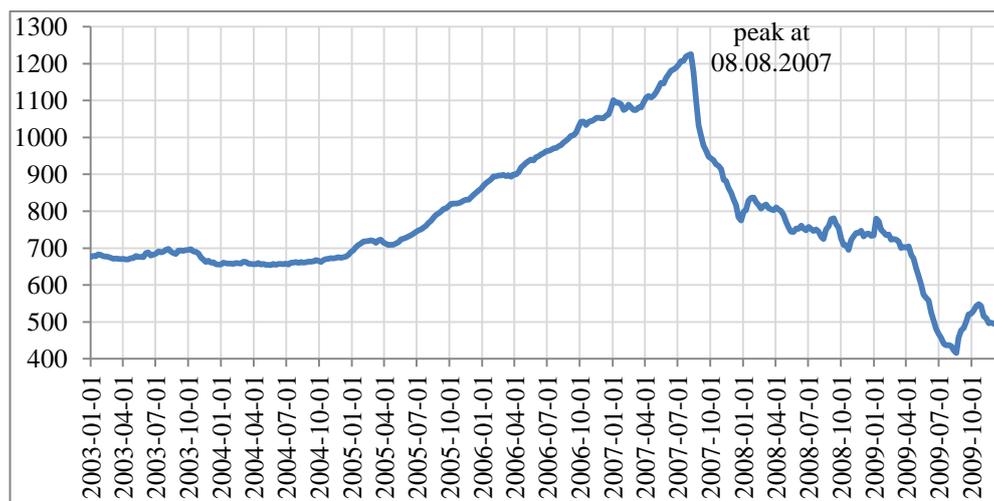


Figure 2.7 Asset-Backed Commercial Paper Outstanding, Billions of Dollars, Seasonally Adjusted, 2003-2009.

Source: Federal Reserve Bank of St. Louis.

Retrospectively, these events are interpreted as the first collapse of short-term borrowing markets and the decline in confidence among financial institutions during the turbulent 2007-2008 periods. Thus, August 2007 can be marked as the start of a systemic crisis by common consent. Similar runs on short-term wholesale funding markets, runs on shadow banks and drying up of interbank loans markets repeated during 2007 and 2008. In November 2007, many banks were forced to write-downs and this made difficult to borrow in interbank lending market. In March 2008, Bear Sterns, the then fifth biggest investment banks in the US, faced with run on by its clients and counterparties and could not borrow from repo markets (Brunnermeier, 2009:86). Finally, the biggest run on wholesale funding markets and runs on money market mutual funds came after the collapse of Lehman Brothers and AIG bailout in September 2008<sup>12</sup>. All these dates mark those three striking spikes in TED spread during the 2007-2008 periods (see Figure.2.6).

With the first systemic shock in August 2007, the other fixed-income asset classes, including the highest rate of subprime tranches and those unrelated with the

<sup>12</sup> See Brunnermeier (2009) for detailed description of these events.

housing market have begun to lose value<sup>13</sup>. After that, during 2007 and 2008, beyond the shocks that hit markets abruptly, several self-reinforcing mechanisms have been at work<sup>14</sup>. One of the most popular channels indicates the relationship between the decline in asset prices and repo haircuts<sup>15 16</sup> (see Figure 3.8). Mishkin (2010: 2) gives a simple way of explanation: “[a]s the value of mortgage-backed securities fell and uncertainty about their future value increased, haircuts [reached] to levels as high as 50 percent. The result was that the same amount of collateral would now support less borrowing, leading to deleveraging in which financial institutions had to sell off assets. The resulting “fire sale” dynamic ... led to an adverse feedback loop in which the decline in asset values lowered the collateral’s value while further raising uncertainty, causing haircuts to rise further, which forced financial institutions to deleverage and sell more assets, and so on.”<sup>17</sup>

---

<sup>13</sup> See Figure.2.1 and Gorton and Metrick (2010).

<sup>14</sup> See especially Brunnermeier (2009) for a detailed analysis.

<sup>15</sup> Brunnermeier (2009) focus also on other channels that compounded balance-sheet contraction and deleveraging. These arguments will be analyzed in the subsequent section. Repo-haircut channel is chosen here because of its prevalence. See e.g. Mishkin (2010), Bernanke (2010b) and Gorton and Metrick (2010).

<sup>16</sup> Repo is a two-stage agreement. In order to raise funds in repo markets, a borrower, who takes Y amount of funds from an investor, sends an asset as collateral, which has a value of X, and agrees to buy back the asset at due with a price Z. Then,  $(Z-Y)/Y$  becomes the repo rate, which is an analogous to interest rate (Gorton and Metrick, 2010), and  $(X-Y)/X$  is called as “haircut” (or a margin), which represents “the perceived underlying risk of the collateral and protects the lender against a change in its value” (Gorton and Metrick, 2010: 38). More on this issue will be in the next section.

<sup>17</sup> This story is supported by the findings of Gorton and Metrick (2010). Moreover, by investigating the forces that drive down non-subprime assets for 2007 and 2008, Gorton and Metrick (2010) find that most of them are significantly affected by LIB-OIS spread, but not by ABX spread. Moreover, they find that repo spreads (the spread between repo rate and a risk-free rate) are also only affected by LIB-OIS spread. When they analyzed the determinants of the haircuts for different classes of collateral in the repo market, they find that it was only affected by volatility (as a measure of uncertainty). Thus, they concluded that loss of confidence (LIB-OIS spread) between financial agents and uncertainty about the values of collateral-assets became the constituents of a systemic crisis.

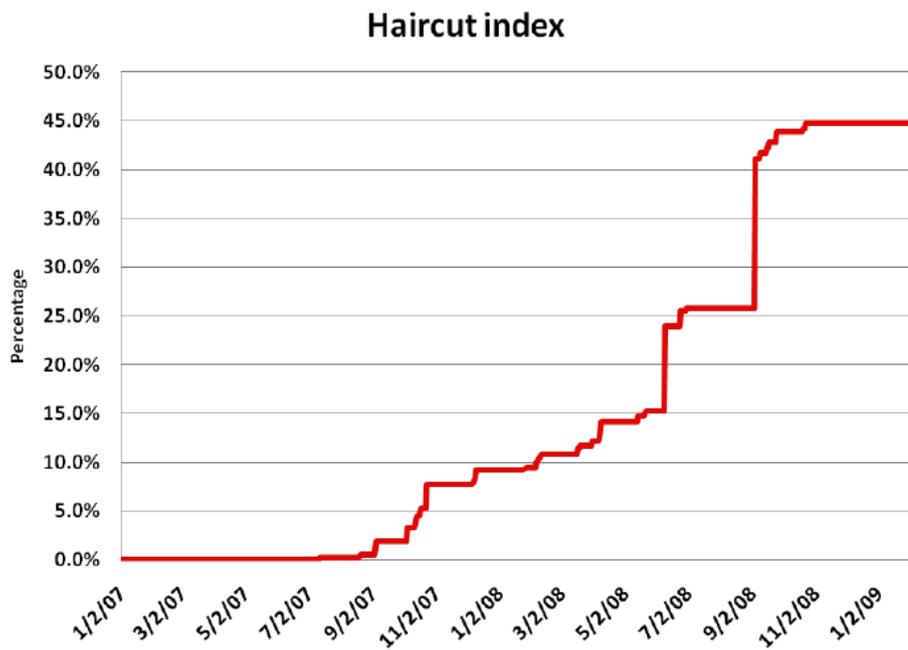


Figure 2.8 The Repo- Haircut Index

Source: Gorton and Metrick (2010).

Notes: Gorton and Metrick (2010) calculates the haircut index as the equal-weighted average haircut for nine asset classes, including corporate loans, several type of asset-backed securities and structured products, all of which include also different investment-grade classes. They include haircuts of 100 percent, i.e. non-traded, in the index.

Besides run on wholesale funding markets, several events are worth to note in order to follow the arguments about the causes of the crisis<sup>18</sup>. Firstly, in the fall of 2007, many financial institutions were forced write-downs on their books, when the losses related with mortgages revised upward; as a result, short-term borrowing market faced hard conditions. Secondly, in March 2008, Bear Sterns, “the smallest, most leveraged investment bank with large mortgage exposure” and large holder of agency papers (Fannie Mae and Freddie Mac bonds) witnessed a run on itself by his hedge fund clients and counterparties and in the end, was sold to JPMorgan Chase

<sup>18</sup> This paragraph and the next one mostly draw on Brunnermeier (2009).

with a generous grant of loan by New York Fed (Brunnermeier, 2009:88). Finally, since mortgage defaults went on during the process, the spread of agency bonds (especially of the two government-sponsored enterprises (GSEs), Fannie Mae and Freddie Mac, who securitized and held a large fraction of mortgages) has risen and their stock prices has declined until they were put under federal conservatorship in September 2008. According to Brunnermeier (2009), this triggered a “credit event”, necessitated large payments to those who hold credit default swaps (CDSs)<sup>19</sup>. In the midst of September 2008, Lehman Brothers, which is the then fourth largest investment bank, went into bankruptcy since it was not bailed out or merged with another large banks; and the AIG (American International Group), which is the largest insurance company in the US, that had severe exposure to CDSs and structured financial products, faced liquidity shortage and was bailed out in the end. These last two events became the severest shock to the financial markets.

This story of the events, which is incomplete and has full of contentious issues, is a simple description of what the prominent events were during the turbulent years. Nonetheless, they give insights about what was problematic during the crisis. Firstly, it seems that some large banks, investment banks and their conduits (such as ABCP conduits) were at the core of the problems. Secondly, the place that most of the events occurred was short-term wholesale borrowing markets. Thirdly, self-reinforcing dynamics that based on the interactions between asset prices, collateral values, wholesale funding markets, market liquidity and deleveraging process plays an important role in the development of the crisis. These endogenous, self-reinforcing mechanisms of deleveraging bring us to the questions about the importance of self-reinforcing mechanisms of the boom period in explaining the build-up of financial vulnerabilities. Moreover, the build-up of systemic risks and increasing leverage through mortgage related assets can also be attributed to the circumstances that regulatory changes and/or supervisory recklessness had been created before the crisis. In particular, a significant part of this story is related with

---

<sup>19</sup> CDS is an insurance-like paper, which only pays in the case of contingent events, typically a default.

the capital adequacy requirements and methods of managing equity capital, which reflects itself most clearly in the insolvency and bankruptcy of several financial companies. Finally, the problems in the regulation and supervision of the GSEs and credit rating agencies, the privileges bestowed upon these institutions by their regulation, and resulting skewed incentives (such as conflict of interests, mutual dependencies) can be counted among the factors that distorted the financial markets and helped cause the crisis.

As a result, the simple question is still waiting for the solution: how such a small market (subprime) can trigger an avalanche in the global financial markets? The answer to this question lies in the understanding the mechanisms of securitization and derivatives like CDSs, incentive problems and regulatory environment, and self-reinforcing mechanisms of financial markets. One of the main aims of this chapter is to show that some of the foregoing components of financial system indeed give robust explanation to how subprime mortgage collapse evolved into devastating financial crisis.

## **2.2. Financial Innovations and New Financial Practices that are related with the Crisis**

Two fundamental financial innovations and related practices are at the center of the debate over the causes of the crisis: securitization and credit derivatives (in particular, credit default swaps-CDSs). We argue and show that these can be linked to the deterioration in lending standards, undercapitalization of banking system, excessive risk-taking, increasing dependence on the wholesale funding markets, high leverage, asset price movements and subprime mortgage boom and housing price boom. In this section, we mainly analyze how these innovations operate and how they can be related with the crisis. Firstly, we will analyze the basics of them: how they operate, what are their functions and what the data tells about them. We include the basics of off-balance-sheet vehicles and wholesale funding markets in separate parts since these are interacted with securitization. Also, we will cover the critical points about CDSs in this “basics” part. Secondly, we will investigate the role of

securitization in the build-up financial vulnerabilities in three different parts. The core of this section will be this part since there is a very big role for the securitization in explaining characteristics of the crisis.

### **2.2.1. Basics for Securitization, Derivatives, Off-Balance-Sheet vehicles and Wholesale Funding Mechanisms**

In this part, we examine the operation and functions of securitization, off-balance sheet vehicles, short-term borrowing markets, and derivatives, respectively.

#### **2.2.1.1. Securitization: operation, functions and statistics<sup>20</sup>**

Securitization is the process through which an issuer of asset-backed security (ABS) pools financial assets (loans, bonds etc.) and divides them into tranches (slices) with different characteristics according to their maturity or risk structures in order to sell them to investors. These securities mainly facilitate for the issuer to get the whole value from the underlying loans and bonds immediately rather than relying on their regularly flowing payments. Also, securitization mainly allows the banks that originate or hold loans for removing them from their balance sheets. Thus, with securitization, the originators of loans make profit from the intermediation fees, not from the interest payments. Securitization is one of the central activities of investment banks, but also it has been widespread among especially the largest commercial banks through their specialized vehicles alongside their traditional activities.

Securitization process starts with pooling of certain assets together and transferring (or selling) them to a Special Purpose Vehicle (SPV), which is legally a different entity that securitize the underlying loans. Securitization of underlying assets means that SPV issues shares or bonds relying on the pool of assets and they are collateralized by the pool itself. Typically, SPV slices the pool into tranches with different characteristics depending on the risk or term structure or quality and

---

<sup>20</sup> This part draws mostly on Cömert (2013), Dodd (2007), Gorton and Metrick (2010), Mishkin and Eakins (2012).

contractual properties of the underlying assets in order to make these tranches have different investment grades. Those tranches will get returns, which come from the interest and principal payments of underlying assets, according to their investment grade. Since all underlying assets packaged together, losses coming from an underlying asset firstly falls on the least level tranche of the pool, so it will have the riskiest character, but the highest rate of return. Finally, these generated asset-backed securities (ABS) are either sold to investors directly or sold to another SPV (or investment banks) which issue collateralized debt obligations (CDOs)<sup>21</sup> that rely on underlying ABSs.

The process of CDO issuance and selling to investors operates similar to that of ABS and it may be thought as the second derivative of underlying assets. In a similar vein, CDO-square and CDO-cube, which rely on underlying CDOs, can be thought as the third and fourth derivatives of the underlying assets. In each layer of securitizations and re-securitizations, typically, the lower-grade (BBB or BBB-) tranches are transferred to the next step. For example, in a pool consisting of prime and subprime mortgages, since subprime mortgages are riskier than others, they will be packaged in an MBS with a lower grade. Then, a SPV or an investment bank can pool those subprime MBSs and can re-securitize them within a pool or into a CDO, which consists of different tranches with different grades. In doing so, the riskiest segments of mortgages can partly be transformed into more liquid products, because buyers of the top-grade tranches (senior tranches) will be guaranteed to be paid first with those flows of payments. This means that only in the case of very high delinquency of underlying loans, they will suffer losses; therefore, the riskiest and originally illiquid loans will be turned into liquid loans.

Flourishing of securitization activity in the US dated back to the 1970s and it was closely related with the mortgage market developments<sup>22</sup>. Therefore, the most

---

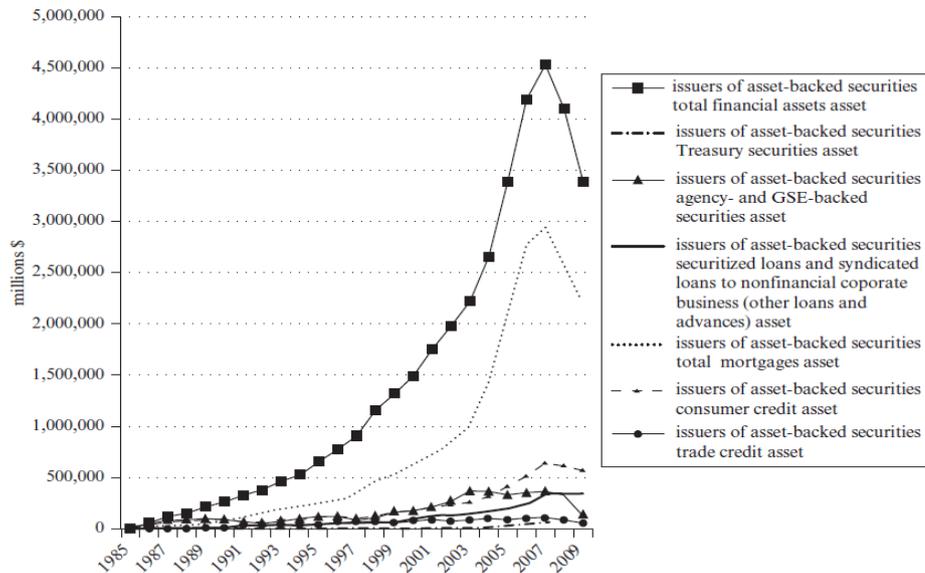
<sup>21</sup> CDO can be a securitization of either corporate bonds or asset-backed securities or a mixture of them.

<sup>22</sup> The literature on mortgage market developments considers the problems of traditional mortgage markets as the impulse behind mortgage securitization. Firstly, traditional mortgage lending activity necessitates holding mortgage loans in the balance-sheet of the originator. Since mortgage loans have

important type of asset-backed securities (ABSs) has been mortgage-backed securities (MBS), which is also at the heart of the debate over the causes of the crisis (see Figure.2.9). As seen from the figure below, MBSs reserved nearly two-thirds of all ABSs at the peak of ABS issuance, before the crisis.

---

very long maturity, this makes it hard for the originator to yield and makes the originator exposed to several risks, thereby costs. These risks include default risk (credit risk), which necessitates costs to assess borrower quality; liquidity risk that arise from funding long-term loans with short-term liabilities; and interest rate risk (market risk) that is able to make loan less valuable in the case of increasing interest rates (Dodd, 2007: 16). Secondly, a traditional solution to maturity-related problems of mortgage market became the creation of a secondary market through which originators can sell mortgage loans to investors. In order to increase liquidity and capital for mortgage markets, mortgage banks, which were exempt from branching regulations, so exploited the economies of scale, and a government agency, starting with the establishment of Fannie Mae in 1938, come into effect (Mishkin and Eakins, 2012). Especially Fannie Mae, as a government-owned entity, assumed the role of secondary market and undertook the default, liquidity and market risks since it had an advantageous position to bear the burden of these risks. However, since finding private investors in the secondary market for relatively small mortgage loans is costly and bundling of mortgages with different maturity, risk and contractual characteristics is difficult, and since the debt of Fannie Mae, as a government agency, enlarged government budget deficit, the creation of secondary market in this way could not be enough to solve the problems of mortgage market (Mishkin and Eakins, 2012; Dodd, 2007) (See Figure.2.5 for how small the market for mortgages was even in 1970). Finally, mortgage securitization get on the stage with the reorganization of secondary market in the 1970s, including the creation of Ginnie Mae and Freddie Mac, and the privatization of Fannie Mae, the latter two of which are called government sponsored enterprises (GSEs), even they are private corporations. (“The reorganization created the Government National Mortgage Association (Ginnie Mae) to handle government guaranteed mortgages through veterans and other federal housing programs. It also privatized the remaining activities into a federally chartered, privately held corporation—officially named Fannie Mae—that retains some public interest obligations for low-income housing... The Federal National Mortgage Corporation (known as Freddie Mac) was created in 1970, both to securitize conventional mortgages and to provide competition to the recently privatized Fannie Mae” (Dodd, 2007:16)).



Source: The Federal Reserve Statistical Release, Table L126.

Figure 2.9 The components of Asset-Backed Securities Issuance in the US

Source: Cömert (2013).

Mortgage-backed securities were, at first, issued by government-sponsored enterprises (GSEs) during the 1970s in order to provide liquidity and draw capital to the secondary mortgage markets, although the process accelerated only in the 1980s (see Figure 2.10 and Figure 2.11). The share of three GSEs (especially of Fannie Mae and Freddie Mac) has always been very high in mortgage-backed security issuance. During the 2000s MBS issuance of GSEs reached at its peak, although its share was falling to the record levels (see Figure.2.12). It is evident that although private sector had kept a small share constantly until 2003, then it grabs the lion's share in the mortgage security issuance just before the crisis, reaching 70 percent share in 2006 from 20 percent in 2003.

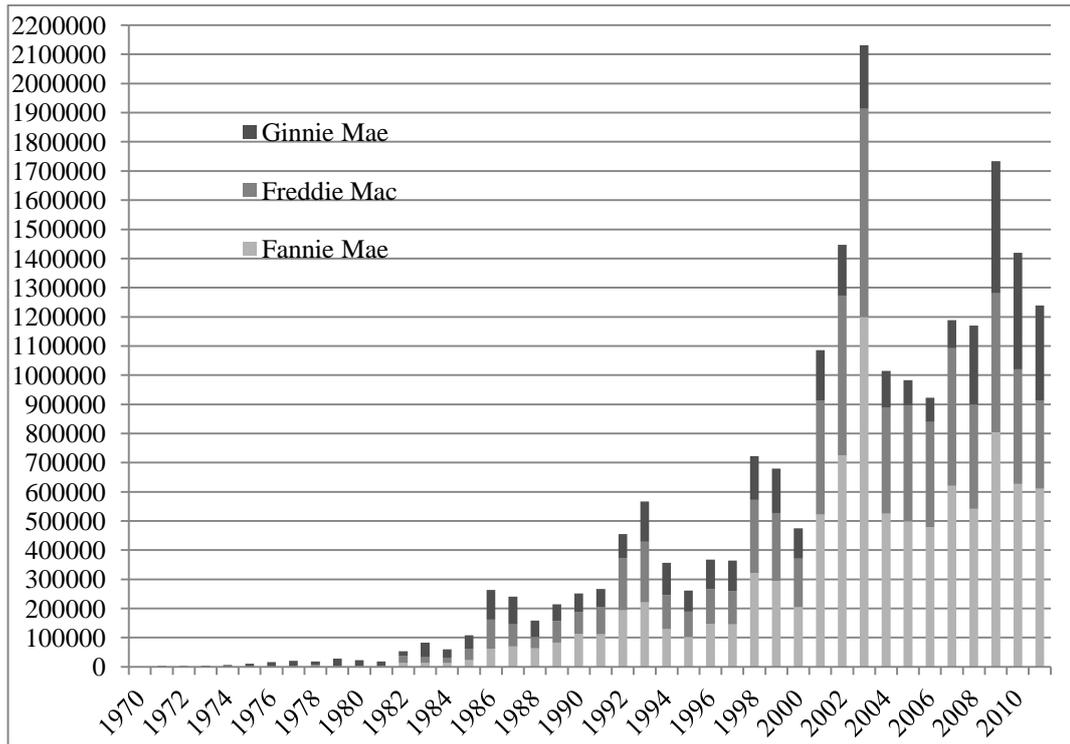


Figure 2.10 The US Agency Mortgage Securities Issuance, USD Millions

Source: SIFMA.

Notes: Agency securities include those backed by 1-4 family and multifamily mortgages. Freddie Mac started issuing in 1971 and Fannie Mae started issuing in 1981.

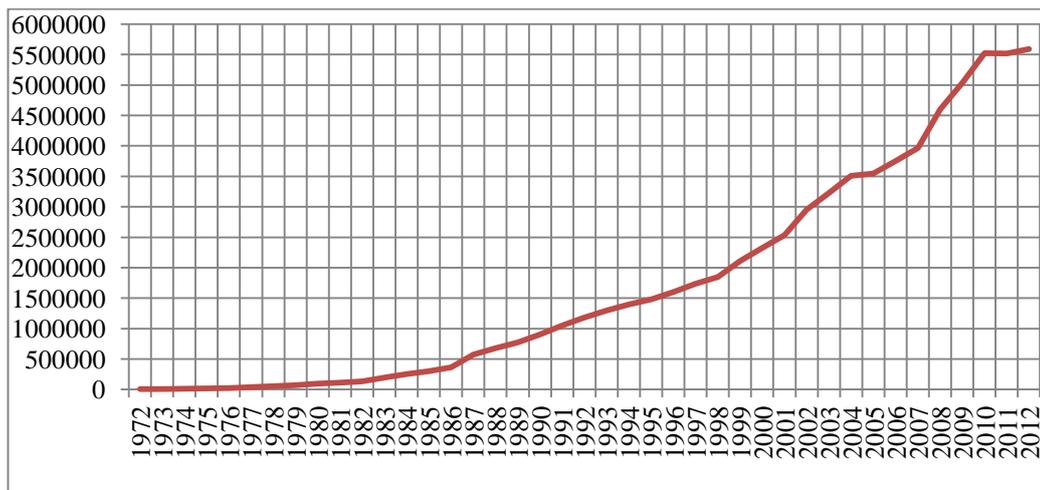


Figure 2.11 US Agency Mortgage Securities Outstanding, USD Millions

Source: SIFMA.

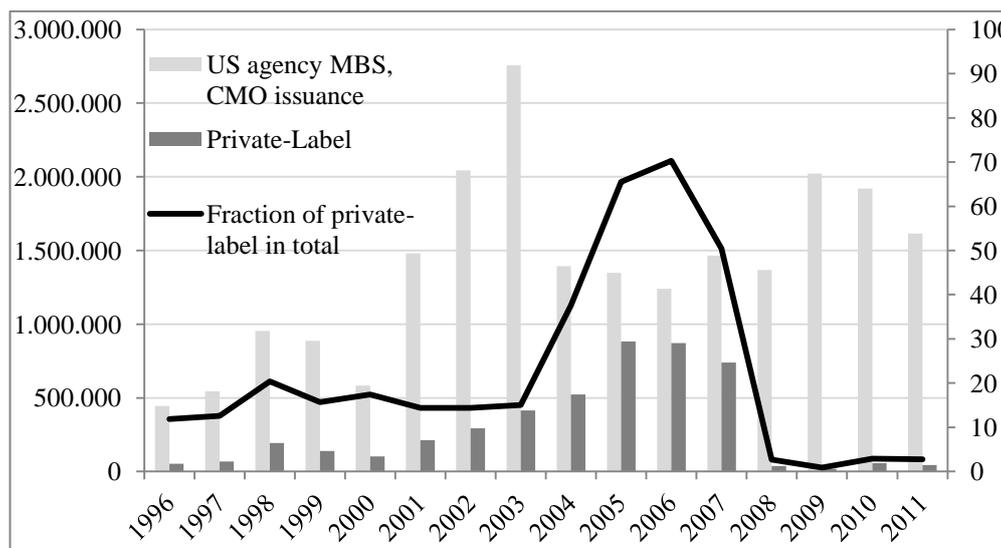


Figure 2.12 The Shares of Private sector and Government-Sponsored Enterprises (GSEs) in Mortgage-Backed Security Issuance (1996-2011).

Source: SIFMA, author's calculations.

Notes: US agency issuances include the issuances of mortgage-backed securities and CMOs by Ginnie Mae, Fannie Mae, and Freddie Mac. Private-label issuances include non-agency MBS and CMOs. The amounts in left axis are in millions of \$US. The right axis shows the fraction of private-label security issuance as a percentage of total mortgage-related security issuance.

The basic type of mortgage securitization, dubbed as mortgage pass-through, is the management of pools by a trustee, i.e. a bank or a government agency, which transfers mortgage payments to investors who have claims on the pools through MBSs (Mishkin and Eakins, 2012). In the mid-1980s, slicing of pools were introduced by Freddie Mac and collateralized mortgage obligations (CMOs) were created, by which mortgage pool is divided into tranches according to the maturity of underlying mortgages, so investors are allowed for matching their maturity requirements and avoiding from the prepayment risk embedded in mortgage pass-through (see Figure.2.13). Finally, collateralized debt obligations (CDOs) were created by the private sector in the 1990s and they became prominent during the housing boom in the 2000s, by which tranches are created usually based on the risk

structure of mortgage loans rather than only maturity structure (Mishkin and Eakins, 2012) (see Figure 2.14 and Figure 2.15). Thus, this development mainly allowed investors to match their risk preferences and allowed private financial firms to originate more risky mortgage loans (subprime mortgages) since they became able to find investors to those loans through CDO tranches.

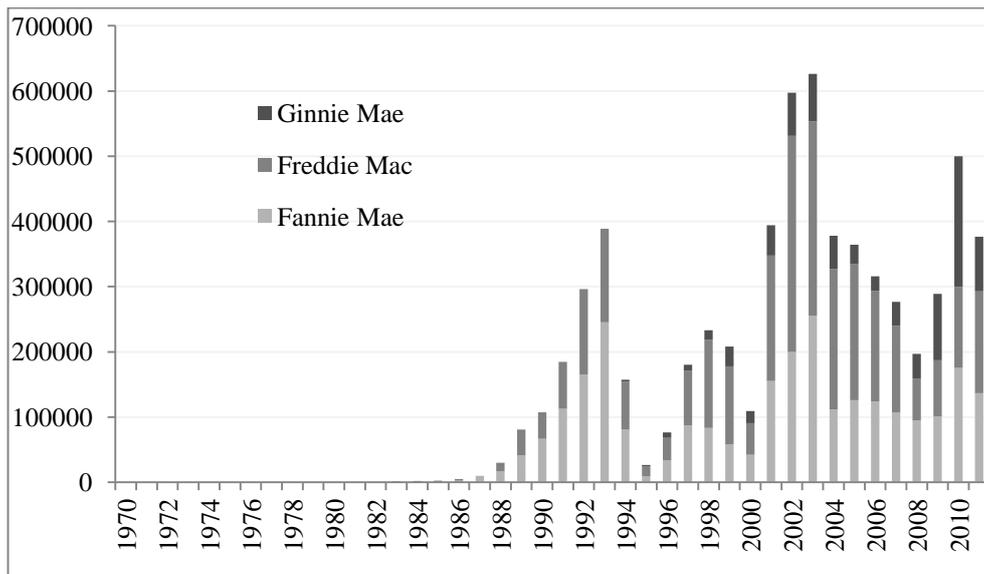


Figure 2.13 US Agency Collateralized Mortgage Obligation (CMO) Issuance

Source: SIFMA.

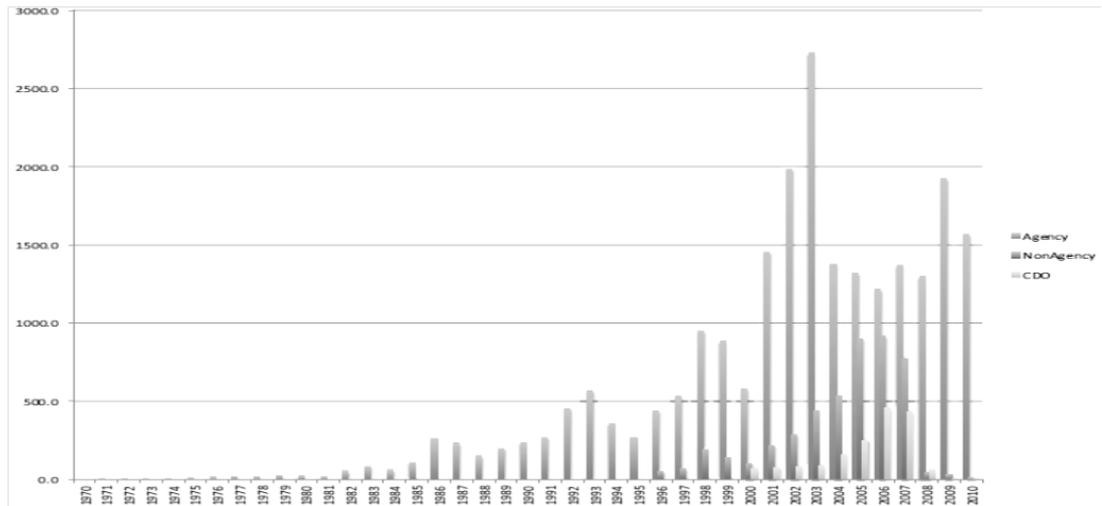


Figure 2.14 The comparative volume of Collateralized Debt Obligations among other securitization and tranching activities

Source: Fostel and Geanakoplos (2011:5).

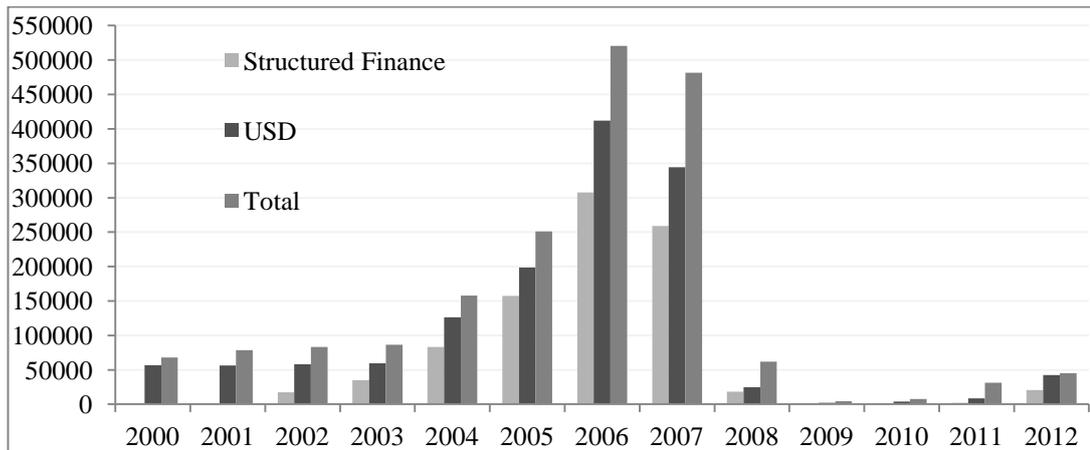


Figure 2.15 Global CDO Issuance, USD-Denominated CDO Issuance and Structured Finance CDOs (USD Millions)

Source: SIFMA

Notes: The highest column shows how much of global CDO issuance (labeled as total) collateralized by the products of structured finance. Structured finance collateral includes assets such as RMBS (residential MBS), CMBS (commercial MBS), ABS, CMOs, CDOs, CDS, and other securitized/structured products. The darkest column shows how much of global issuance denominated in US dollars.

Finally, the functions, benefits and implications of securitization process can be summarized in four points, according to the literature we draw on. First, securitization allows banks or government sponsored agencies (GSEs) to remove interest rate risk and liquidity risk from their balance sheets because the originated loan will no longer be in the balance sheets of these institutions. It also allows banks to avoid from credit risk<sup>23</sup>, because by securitization this risk is transferred to the investor of ABSs, in principle. Secondly, investors get more liquid and diversified assets relative to underlying assets. Thirdly, since the process creates more liquid assets, this allows for drawing more capital into the markets for those securitized assets. Fourthly, with the introduction of CDOs and tranches that differentiate mortgages in terms of their risk structure, it allows banks to extend credit to the less creditworthy borrowers because these innovations enable banks selling even the riskiest loans to the investors in the secondary markets. It is supposed that investors that are able manage the risk associated with these tranches will purchase them, so there will be enough resources to extend credit to less creditworthy borrowers.

#### **2.2.1.2. Special Purpose Vehicles<sup>24 25</sup>**

There are several forms of special purpose vehicles (or entities, SPV or SPE, or called as conduits), which are legal entities that are directed by the sponsoring firms (banks, finance companies, investment banks or insurance companies) in order to operate in the acquisition and financing of specific assets and liabilities (BIS, 2009)<sup>26</sup>. An SPV can be formed to operate in pooling residential or commercial mortgages, producing CDOs, and also formed to invest in long-term assets, such as

---

<sup>23</sup> This is not the case for GSEs considering their guarantee on the underlying mortgages.

<sup>24</sup> This part heavily draws on BIS (2009).

<sup>25</sup> See Acharya and Schnabl (2009:7-10) for a very nice description and a real example of how an ABCP conduit works.

<sup>26</sup> BIS (2009:1) report separates asset securitization and liability securitization. For the latter, it states that “[l]iability securitisations are usually undertaken by insurance companies, and typically involve issuing bonds that assume the risk of a potential insurance liability (ranging from a catastrophic natural event to an unexpected claims level on a certain product type).” In the context of our discussion, liability securitization vehicles refer to the arms of insurance companies or monoline insurance companies that sell tradable insurances, like CDSs.

asset-backed commercial paper (ABCP) conduits or structured investment vehicles (SIVs). An important feature of SPVs is the bankruptcy remoteness, by which assets of an SPV are isolated from the case of bankruptcy of the sponsoring firms (BIS, 2009). Also, they are designed in a way that they cannot go into bankruptcy (Gorton and Metrick, 2010).

In principle, it is argued that the main benefit of these entities is their role in the disaggregation and reallocation of the risks exposed by underlying pools of assets, which is supposed to be beneficial for both the sponsors and investors (BIS, 2009). They can be formed with the purpose of better risk management, or in order to raise low-cost funds, or to achieve off-balance-sheet treatment for their assets, thereby to achieve capital adequacy requirements set by regulations, according to BIS report (2009). While some SPVs, such as SIVs, MBS and CDO vehicles, achieve a high level of risk transfer, some others, such as ABCP vehicles, need for potential credit supports from the sponsoring firms, so they have high risk retention (BIS, 2009). In general, these legally different entities have been linked in several ways to the sponsoring firms, but perhaps the most important ones were liquidity and credit guarantees provided with the lines of credit by sponsoring firms (Dodd, 2007; Calomiris, 2009). Finally, these entities are included in the concepts like “shadow banks”, “securitized banking”, “wholesale banking” or “investment banking”, by which mostly referred to the activities of dealers and underwriters related with securities markets and financial mediating rather than traditional banking activities related with originating and holding loans, and investment in assets<sup>27</sup>.

### **2.2.1.3. Wholesale Borrowing Markets<sup>28</sup>**

In the context of the crisis, secured fund-raising, especially repo and ABCP, takes an important place since it is related with the value of assets that used as collateral, so it reacts to asset price changes. In a repo contract, the borrower takes

---

<sup>27</sup> ““Underwriting” refers to the business of assuming the risk that an issue of securities will not be fully sold to investors, while “dealing” refers to the business of holding an inventory of securities for trading purposes” (Wallison, 2009: 3).

<sup>28</sup> This part mostly draws on Gorton and Metrick (2010).

funds by selling a collateral asset with a repurchasing agreement in due date<sup>29</sup>. Typically, this contract has short-term maturity changing in between overnight repos and those with 90-days maturity. In a similar sense, ABCPs, which are issued by special ABCP conduits that are formed to raise short-term funds, secure debts with a bundle of assets and have a very-short-term maturity. In the case of a default of one party in the contract of the repo, the other one has the right to own either cash or asset (Gorton and Metrick, 2010). Although ABCP conduits are not legally supported by the sponsoring firms, but typically, they are supported with liquidity enhancements and implicit guarantees (Calomiris, 2009).

In the repo market, two prices are determined by the contractors: repo rate and haircut. The repo rate, which is analogous to interest rate, is the ratio of the difference between the values of funds raised and repaid to the value of collateral. Since the collateral provides security to the lender, in a world without uncertainty and transaction costs, repo rate should be equal to risk-free rate, and so it nearly was before the crisis (Gorton and Metrick, 2010). The haircut is the ratio of the difference between the amount of funds raised and the value of collateral to the value of collateral. Haircuts reflect perceived risks about the value of the collateral and as it can be expected, haircuts were at very low levels before the crisis (Gorton and Metrick, 2010) (see Figure 2.8).

The importance of wholesale funding markets is also related with the functioning of so-called “shadow banking” system (investment banks, brokers and dealer firms, hedge funds and SPVs) that does not accept retail deposits and so relies heavily on these markets to raise funds and invest in assets. During the last boom both repo markets and ABCP markets have grown rapidly. The volume of ABCP outstanding nearly doubled from 2005 to the peak at August 2007 (see Figure.2.7). Although the true size of repo markets is not known, since investment banks are heavily relied on repo relative to commercial banks, Gorton and Metrick (2010)

---

<sup>29</sup> Moreover, “[t]he collateral received by the depositor in repo may be rehypothecated, that is, the depositor can use it in another, unrelated, transaction. This creates a multiplier process for collateral, like the more familiar money multiplier. Since there are no official data on repo, the size of this money multiplier is not known” (Gorton and Metrick, 2010: 10)

argue that the growth of total assets of these banks can give crude information about the size of repo markets. In this respect, they state that “the ratio of broker-dealer total assets to commercial banks’ total assets has grown from less than 5 percent in 1990 to a peak near 25 percent in 2007” (Gorton and Metrick, 2010: 13).

Moreover, since the recent boom period is characterized with increasing securitization of mortgages, wholesale funding markets became more important and interacted with securitization in keeping the boom active. According to Gordon and Metrick (2010: 3-4) “[i]n securitized banking, funds are lent only temporarily, with loans repackaged and resold as securitized bonds. Some of these bonds are also used as collateral to raise more funds, which completes the cycle.” They also state that tranching activity and resulting AAA-rated tranches are demanded heavily because, particularly, they are accepted as collateral in raising funds in short-term borrowing markets. Thus, securitization process and wholesale funding mechanisms complete and feed each other.

#### **2.2.1.4. Derivatives<sup>30</sup>**

Derivatives, in general, are financial instruments used for hedging and risk management purposes, whose value “is linked to the price of underlying commodity, asset, rate, index or the occurrence or magnitude of an event” (Dodd, 2010). They include futures, forwards, swaps, options and structured securities. In general, derivatives are mostly traded in the over-the-counter (OTC) markets in which only two parties (buyer and seller) know prices. Thus, derivatives markets are not transparent about traded prices and volumes, and also, investors do not know about derivatives positions of financial institutions (Dodd, 2010). The main benefit of derivatives is supposedly that they allow hedging a specific risk (any kind of event, such as weather condition) associated with productive or financial activities. Thus, in principal, they are supposed to allow better risk management by transferring a specific risk to one who wants to and able to bear it.

---

<sup>30</sup> This part heavily draws on Dodd (2010) and Stulz (2010).

In the context of the crisis, credit default swaps (CDS) are at the center of the debate. Credit default swaps are specific to credit events and mainly allows avoiding from credit risks. Thus, a CDS can be considered basically as an insurance contract on an asset which pays to the buyer only in the case of default and brings premium fees regularly to the seller until the case of default. However, most importantly, holding a CDS does not necessitate any direct exposure to the default, i.e. one can hold a CDS without hold the underlying asset. Also, as opposed to insurance contracts, CDSs can be traded in the OTC market (Stulz, 2010). The insured amount with a CDS is called as the notional value, but the market value (fair value) of a CDS is about the expected default loss (Stulz, 2010).

Supposedly, the main benefit of the CDSs is related with hedging credit risk, so better risk management. According to Stulz (2010:75), in principle, CDSs “should make financial market more efficient and improve the allocation of capital” through separating the credit risk from other determinants of the price of a credit. This separation brings about transferring the credit risk to those supposedly who able to bear it and also brings greater transparency about the pricing of credit risk, so the credit itself. In principle, all these result in the decline in the cost of capital and it is expected that this enables financial firms to make much more loans than they would otherwise<sup>31</sup>.

CDSs were introduced in the mid-1990s and became very popular during the boom of the 2000s, reaching at peak nearly \$60 trillion outstanding (as notional value) in 2007 (See Figure.2.16). This notional amount covered approximately \$5 trillion in market value for this year (Brunnermeier, 2009; Crotty, 2009). Although it was first introduced for the corporate and sovereign bonds, they were not standardized for mortgages until 2005 (Fostel and Geanakoplos, 2011). As opposed to definable events about the default of a company, a CDS, which covers a mortgage-backed security or a tranche of CDO, only pays off in the case of the

---

<sup>31</sup> However, Hirtle (2009) shows evidence on the effect of CDSs on corporate loans and find that the foregoing supposition was not true.

losses related with this specific MBS or tranche<sup>32</sup>. Finally, a CDS can be an index which represents an average of a basket of other CDSs. It is generally argued that with the introduction and trading of ABX indices on subprime mortgage related structured products from 2006 onwards, developments in the subprime market are closely followed by the financial market participants.

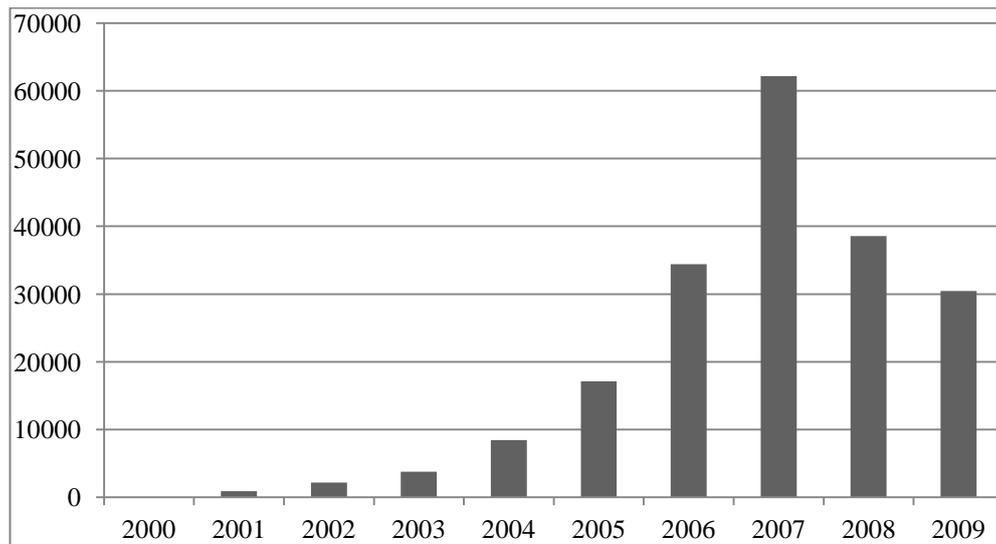


Figure 2.16 Total notional amount of Credit Default Swaps outstanding, USD billions

Source: ISDA Market Survey.

In general, the speculative use of derivatives and systemic risks they brought about can be counted among the factors that contributed to or amplified the crisis (Dodd, 2010; Crotty, 2009)<sup>33</sup>. Huge difference between notional amounts (above \$60

<sup>32</sup> Stulz (2010: 77) exemplifies this : “[s]uppose that an investor holds a AAA tranche with a principal amount of \$100 million and the other tranches of the securitization have been wiped out; further, suppose that during a month \$1 million of mortgages default so that the principal balance falls from \$100 million to \$99 million. At that time, the investor would be paid \$1 million from the credit default swap. Moreover, the credit default swap would still exist after that payment and would make payments as further mortgages default until maturity of the contract.”

<sup>33</sup> Dodd (2010) counts much more problems, stating that “[t]he flexibility and unregulated nature of OTC derivatives makes them highly effective instruments to abuse for the purpose of avoiding taxation, dodging or out-flanking prudential market regulations, and for distorting or manipulating accounting rules and reporting requirements. They can also be employed in the commission of

trillion) and the value of debt insured through CDSs (nearly \$5 trillion) shows evidence on the speculative use such derivatives (Crotty, 2009)<sup>34</sup>. In addition, while it is possible that hedging with derivatives “make an individual investor safer, it can simultaneously make the system riskier” (Crotty, 2009: 573)<sup>35</sup>. On the other hand, the opaqueness of the web of financial obligations among financial firms through bilateral derivatives contracts may contribute to increasing systemic risks (Brunnermeier, 2009). Finally, the separation of risk bearing and funding might have reduced incentives for monitoring and resolving the default problems during financial crisis (Stulz, 2010). For example, an investor “might prefer to drive the firm into bankruptcy and thus trigger payments under the credit default swap, rather than work out a refinancing plan” (Stulz, 2010:76). In the mortgage case, the expectation that defaulted mortgage loans could not be restructured might have been the main motivation behind excessive rise of notional amounts of CDSs in 2007.

What is more, derivatives can be criticized due to the problems they created at the late stage of the crisis, such as the complexity of clearing and netting out of bilateral contracts. Even in a network of fully hedged swap contracts (not only CDSs) among many financial firms, since all parties only know their bilateral agreements, they would concern about counterparty credit risks, which, in turn, necessitates either raise additional liquidity or buying CDSs against counterparties, as Brunnermeier (2009) aptly put it. At the end, this will tighten liquidity or make some financial institutions more vulnerable because buying CDSs against a firm will raise CDS prices for it. Brunnermeier (2009:97) shows an example of such a situation from the late phase of the crisis: “[a]ll major investment banks were

---

criminal acts of fraud and market manipulation.” See Dodd (2010) for some examples of such events from the 1990s and 2000s.

<sup>34</sup> Moreover, Crotty (2009: 568) states that “Fitch Ratings reported that 58% of banks that buy and sell credit derivatives acknowledged that ‘trading’ or gambling is their ‘dominant’ motivation for operating in this market, whereas less than 30% said that ‘hedging/credit risk management’ was their primary motive.”

<sup>35</sup> Crotty (2009:573) gives an example of this: dynamic hedging that requires “shorting the risky asset held and investing in a risk-free asset” adjusts to the price changes in assets continuously and requires selling of the risky asset when asset prices decline and the volatility increases. This implies that during the crisis, decline in asset prices will be exacerbated due to dynamic hedging of many firms.

worried that their counterparties might default, and they all bought credit default swap protection against each other. The already high prices on credit default swaps of the major investment banks almost doubled. The price of credit default swaps for AIG was hit the worst; it more than doubled within two trading days”. Moreover, since derivatives positions of financial firms were obscured due to non-transparency of OTC markets, this might have contributed to panic and volatility during the 2008 crisis (Dodd, 2010). Finally, non-transparency of derivatives markets and obscurity about derivatives positions of financial firms might have exacerbated the liquidity problems in financial markets and endanger the existence of some firms during the crisis (Dodd, 2010; Brunnermeier, 2010).

### **2.2.2. Cases for the role of securitization and related practices in the crisis**

In this part, we examine how securitization might have been related with the crisis. This section consists of three parts. First, we will analyze how securitization and off-balance-sheet vehicles allow for the exploitation of regulatory arbitrage and increasing leverage. Secondly, we will analyze how securitization contributed to the accumulation of excessive risks in the financial system via different ways as opposed to allegedly risk-shifting and better risk-management functions of it. Thirdly, we will analyze the mechanisms between securitization and mortgage boom, thence housing boom, relying on the empirical literature.

#### **2.2.2.1. Securitization, regulatory arbitrage and leverage**

By allowing for removing loans and assets from the balance sheets of financial institutions, securitization and SPVs are used as means to sidestep regulatory arrangements. This type of regulatory arbitrage was mainly driven by the capital requirements regulation of Basel I and Basel II accords (Acharya and Schnabl, 2008; Calomiris, 2009, Brunnermeier, 2009). As a result, banks increased their effective leverage by exploiting regulatory arbitrage and increased their vulnerabilities, too. In principle, securitization and credit risk transfer mechanisms (referring to SPVs) does

not necessarily entail increased bank leverage, but banks availed of these mechanisms in order to make profit from regulatory arbitrage by increasing their leverage (Acharya and Schnabl, 2008).

Basel I rules are designed so that loans required more regulatory capital than that is required for assets since supposedly banks could trade them, so did not hold them on their books for a long period, but, this, in turn, creates incentives to hold risky assets, like AAA-rated CDO tranches (Crotty, 2009). Moreover, as it is shown by Acharya and Schnabl (2008), banks actively demanded and held the products of securitization. This process turns into a preferred investment strategy over time, when banks and their conduits held half of those asset-backed securities in their portfolios, as opposed to the supposed risk distribution or risk transfer functions of securitization (Acharya and Schnabl, 2008).

The regulatory arrangements on capital adequacy requirements of banks were standardized with Basel I and Basel II accords<sup>36</sup>. Basel I requirements were applied in many countries, including the US, whereas Basel II requirements were applied in 2007, including European banks but not the US banks, during the crisis. According to the former, banks should hold, at least, 8 percent capital against the loans and high-rated assets on their balance sheet, while the exact proportion of equity capital is determined by the risk-weight of those loans and assets. For example, the risk weight of government debt is close to zero, while it is 50 percent for residential mortgages (not for residential MBS) and it is 100 percent for corporate loans (Cömert, 2013). As it can be expected, the risk-weight of AAA-grade tranches of mortgage-backed products was well below the weight of mortgage loans.

However, since capital requirements mean cost and constraints for banks, because it lowers leverage and risk-taking and also issuing equity is costly, banks search for ways to avoid of and reduce regulatory capital requirements (Acharya and Schnabl, 2008). According to Basel I standards, banks need not to hold capital against those asset held on off-balance-sheet mechanisms. Instead, what banks are

---

<sup>36</sup> This part draws mostly on Acharya and Schnabl (2008; 2009).

required to do is providing credit lines and guaranteeing liquidity or credit enhancements to those conduits they sponsor<sup>37</sup>. Nonetheless, Basel I and national-level regulations impose holding only a very small amount of capital for liquidity enhancement guarantee, and in the US case, it means that banks should hold only 0.8 percent of asset value of their conduits (Acharya and Schnabl 2008; 2009). Although credit enhancement requires holding more capital, it was relatively lower than on-balance-sheet risk-weighted requirements; and also, banks mostly prefer liquidity enhancement in order to provide insurance against outside investors (Acharya and Schnabl 2008; 2009). According to the research of Acharya and Schnabl (2008) on ABCP conduits, there were only 79 conduits supported fully with both credit and liquidity enhancements, whereas there were 234 conduits, which issued 72 percent of total ABCPs, supported with liquidity enhancement but only partially with credit enhancement (for only below 10 percent of assets). Finally, SIVs were supported with only partial liquidity and credit enhancements. Nonetheless, as they have shown, during the crisis, banks took nearly all of the assets of any type of conduits back on their balance-sheets and behaved them as fully supported conduits because of the reputation concerns. So, in effect, while all conduits were effectively linked to the balance-sheet of sponsor firms, they are behaved as if they transfer the risks to investors and distribute credit risk efficiently in the financial markets. As aptly put by Brunnermeier (2009:81), “moving a pool of loans into off-balance-sheet vehicles, and then granting a credit line to that pool to ensure a AAA-rating, allowed banks to reduce the amount of capital they needed to hold to conform with Basel I regulations while the risk for the bank remained essentially unchanged”. As a result, banks exploited the loopholes in capital-requirement arrangements of Basel accords through using securitization and off-balance-sheet vehicles<sup>38</sup>.

---

<sup>37</sup>According to Acharya and Schnabl (2008), while liquidity enhancements provide “a back-up credit line or commitment to repurchase non-defaulted assets in case a conduit cannot roll over maturing CP”; credit enhancement “covers credit losses on conduit assets”.

<sup>38</sup> We will not mention Basel II standards because they were in force only in 2007; and, as many admits, they could not be effective in eliminating the foregoing problems (e.g. Acharya and Schnabl, 2009; Brunnermeier, 2009; Greenspan, 2010a).

In order to comprehend the magnitude of this regulatory arbitrage, we will benefit from two figures from the *IMF Global Financial Stability Report, April 2008*, as was in the study of Acharya and Schnabl (2008) (see Figure. 2.17 below). While balance-sheets of the top 10 publicly-traded and global banks were growing twofold between 2004 and 2007, the size of risk-weighted assets grows only slightly during the same period. Thus, it seems as if these banks invest in relatively safer assets according to regulatory standards of Basel capital requirements while their balance-sheets growing twofold<sup>39</sup>. Moreover, the right-hand picture shows that these large banks have gravitated to investment in assets rather than holding loans between 1998 and 2005. Also, their loans in proportion to all assets fell to such point that their loan-to-deposit ratios fell to 1 and stabilized there. The picture also shows that while balance-sheets of these banks were expanding rapidly with growing share of investment in total assets, this development was financed by mainly non-deposit funding mechanisms because deposit-to-asset ratios fell throughout the process. Thus, these trends show that there was a significant expansion in total assets of the observed 10 large banks with their investments in allegedly “safe” assets through using wholesale funding markets as the main source of finance.

---

<sup>39</sup> The very same picture was reproduced by Kalemli-Ozcan et. al. (2012) with a larger sample that covers all US banks.

### Balance Sheet Profiles for 10 Large Publicly Listed Banks

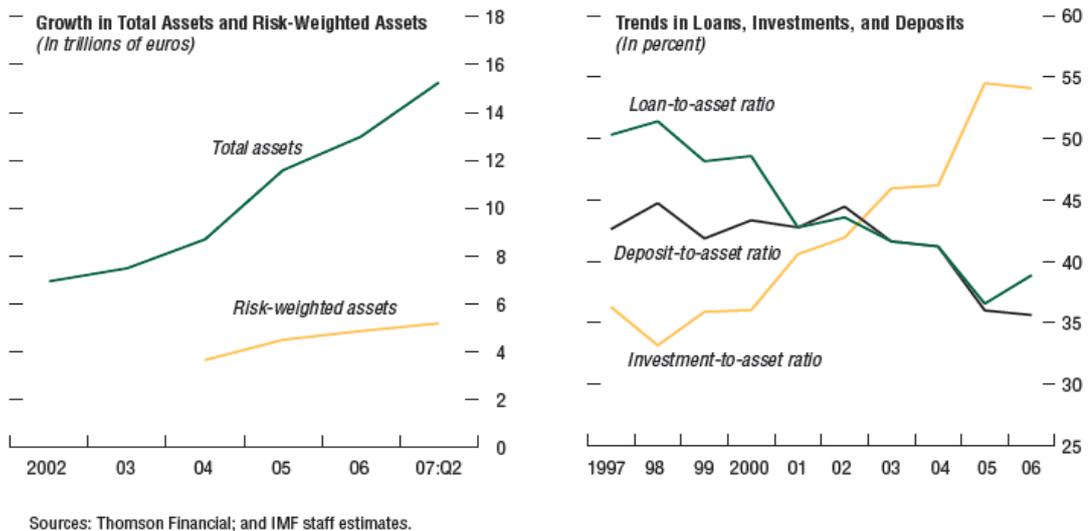


Figure 2.17 Balance-Sheet Profile of 10 Large Banks

Source: <http://www.imf.org/External/Pubs/FT/GFSR/2008/01/> (IMF Global Financial Stability Report April 2008).

What is more, another figure from the *IMF Global Financial Stability Report, April 2008*, shows that those banks with higher ratio of total assets to risk-weighted assets, i.e. the banks that seem safer balance sheet positions according to Basel standards, experienced much more price decline in their shares during the July 2007-March 2008 periods (see Figure. 2.18) Thus, as it is aptly put by Acharya and Schnabl (2008), “the Basel capital requirements were simply “gamed” by banks that had high ratio of total assets to risk-weighted asset. They were indeed much more unsafe than what their capital requirements showed them to be, ended up holding less capital than was suitable for their true risk profile, and therefore, suffered the most during the crisis.” Moreover, Acharya and Schnabl (2008) shows that differences in cross-bank equity price decline were also related with the effective leverage of those banks through their off-balance sheet vehicles. Taking the leverage ratio of a bank (considering the leverage through its conduits) as the ratio of the amount of commercial papers the conduit issued to the bank equity, they show that some of those banks with the extreme level of leverage (e.g. 77% for Citibank and 105% for HBOS) are the same banks which experienced higher share price decline

(see Figure 2.18). On the other hand, the banks with less leverage (e.g. 37% for JPMorgan Chase with and 33% for Bank of America) experienced moderate decline in their share prices during the crisis.

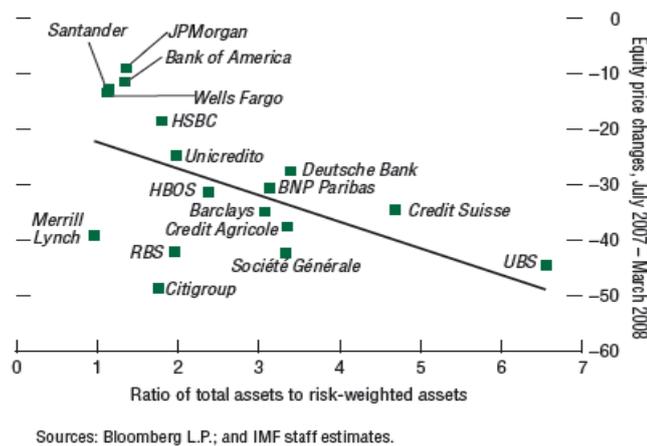


Figure 2.18 Bank Equity Price Changes and Balance-Sheet Leverage of Large Banks  
 Source: <http://www.imf.org/External/Pubs/FT/GFSR/2008/01/> (IMF Global Financial Stability Report April 2008).

As a result, these evidences suggest that those banks that seemed safer according to Basel capital requirement standards exploited regulatory arbitrage much more than others through their securitization and investment vehicles and became effectively much more leveraged. Moreover, they raised their effective leverage by investing in those securitization products, AAA-rated assets, by funding them with wholesale borrowing markets; but this made them exposed to mortgage-related risks and liquidity risk much more than other banks.

#### 2.2.2.2. Securitization and accumulation of systemic risks

One of most important function of securitization is supposedly distribution of risks. However, there are some questions about this function of securitization. In this

part, relying on noteworthy interpretations, we will discuss how it allowed for the accumulation of systemic risks through different mechanisms.

Firstly, securitization can be criticized in the context of originate-to-distribute model and perverse incentives facilitated by this model. In brief, since securitization allows banks to remove the loans from their balance sheet and it allows banks to extend new credit with the lump sum value of previous loans, then it is expected that banks will search for new borrowers continuously. Typically, since securitization pools and local mortgage lenders are different entities, this might have been created moral hazard in the part of originators. For example, Mian and Sufi (2008) show that relative increase in growth of securitization of mortgages for subprime borrowers and subsequent subprime defaults mainly fall to those mortgages originated by mortgage originators who were not affiliated with financial institutions that securitize them.

In the literature, perverse incentives unleashed by securitization and originate-to-distribute model are analyzed within the “asymmetric information” and “agency problem” frameworks (e.g. Mishkin and Eakins, 2012; Stiglitz, 2009)<sup>40</sup>. Accordingly, although mortgage brokers acted as agents of mortgage-backed security investors (principals) in the end, since they earned more fee income by originating more mortgages, this generated a moral hazard on the part of mortgage originators. In addition, “[t]he principal-agent problem also created incentives for mortgage brokers to encourage households to take on mortgages they could not afford, or to commit fraud by falsifying information on a borrower’s mortgage applications in order to qualify them for their mortgages” (Mishkin and Eakins, 2012:171-2). A similar principal-agent problem can be applied to the underwriters of MBSs and CDOs, who acted as the agents of investors, but with weak incentives to make sure that investors were paid off (Mishkin and Eakins, 2012; Stiglitz, 2009).

---

<sup>40</sup> See Mishkin and Eakins (2012, Ch.7-8) and Mishkin (1991) for asymmetric information framework and its usage as a framework to analyze what characterizes financial crises. Agency problems (or principal-agent problem) refer to the problems that arise from the case of separation of the ownership (principal) and the management of a firm. Typically, it refers to a moral hazard on the part of the management, who acts in favor of its own interests rather than the interests of principals.

Moreover, securitization might have brought about the decline in the lending constraints and standards, since it allows for mass production of mortgage loans. The separation of the lender from the risks allows for originating riskier loans and although individual risks might have been reduced, systemic risk increased in the end (Mishkin and Eakins, 2012)<sup>41</sup>. Moreover, extending the dimension of moral hazard related with the originate-to-distribute model throughout the system, it can be argued that securitization resulted in the inefficient evaluation of risks, declining efficiency in screening and monitoring facilities (Stiglitz, 2009). In sum, the extensive use of securitization and relying on the originate-to-distribute model in banking system might have contributed significantly to the accumulation of systemic risks through creating moral hazard in different segments of the securitization process and creating perverse incentives, thanks to fee income; through reducing credit constraints and declining lending standards, and finally, allowing for the reduction in costly screening and monitoring activities.

There are important empirical findings that support these points. For example, Demyanyk and van Hemert (2008) point out the deterioration in loan quality during the mortgage boom. Mian and Sufi (2008) and Dell’Ariccia et. al. (2008) finds evidence on the relationship between declining lending standards and securitization. Moreover, Keys et. al. (2008) shows evidence on that securitization contributed to lax screening.

Besides these points, structural malfunctions in the supposed operation and risk distribution of securitization might have contributed to accumulation of systemic risks. As Crotty (2009)<sup>42</sup> aptly put, although it is supposed that banks remove risks from their balance sheet through securitization, they were still exposed to those risks since they hold those MBSs and CDOs for some reasons. Firstly, in order to

---

<sup>41</sup> In a similar vein, Bernanke (2010b) states that, although originate-to distribute model had some benefits, including lower credit costs and higher accessibility to capital markets by small and medium firms, its expanded use in subprime lending and mortgage securitization was mismanaged in part because of skewed incentives that reward quantity of originated and securitized loans rather than quality.

<sup>42</sup> For similar views that are summarized shortly, see also Crotty and Epstein (2009).

convince investors for the safety of assets, banks should hold the toxic waste, i.e. the riskiest segment of pool is considered as the equity capital of pool (Crotty, 2009). Secondly, CDOs are attractive and high-yielding assets to hold, given off-balance-sheet vehicles without any capital requirements (Crotty, 2009). Thirdly, the time lapse between receiving mortgages, pooling, tranching and sale of MBSs or CDOs entails the accumulation of substantial quantities inside securitization vehicles during the process (Crotty, 2009). Finally, “given banks’ incentive to generate high profits and bonuses through high risk, they purposely kept some of the riskiest products they created” (Crotty, 2009:569). In addition, the highest-grade ABSs and CDO tranches are returned to balance sheet of banks in order to be used as collateral in the repo transactions (Gorton and Metrick, 2010)<sup>43</sup>.

Moreover, as we have seen in the previous part, those securitized products with the highest investment grade are highly appealing for investment because they had higher yields relative to risk-free bonds and they are considered as safe products that require only a sliver of, if any, equity capital. This might have been one of the main drivers of demand for the mass production of these products from global banks, especially Europe-based banks (Greenspan, 2010a; Obstfeld and Rogoff, 2009). Also, with the advancement of securitization and the creation of risk-based tranches, institutional investors –such as pension funds or money market mutual funds that were exempted from holding any other assets except AAA-rated securities by the regulatory requirements- could invest in AAA-rated tranches constructed from the risky segments of mortgages; thence they might have caused increasing demand for these products (Brunnermeier, 2009). Thus, it can be concluded that, a significant portion of the securitized products, which were supposed to distribute risks throughout the system and allow banks for relieving from holding these risks, were, in fact, held by banks themselves for several reasons. Among these reasons, some of them were the result of regulatory arrangements. All in all, all these contributed to the accumulation of risks rather than their distribution.

---

<sup>43</sup> Acharya and Schnabl (2008) provide evidence that supports all these points by showing that half of all the AAA-rated asset backed securities was parceled by banks themselves and their conduits before the crisis.

Finally, with the rise of pooling and packaging of different type of MBSs into complex products and with the rise of many other types of financial products, the financial risk management practices, risk evaluation might have become all the more complex. Thus, it can be argued that large part of risk evaluation shifted towards the ratings of credit rating agencies, which were not sufficiently adept at risk evaluation and suffered from perverse incentives to inflate ratings (Bernanke, 2010b; Greenspan 2010b; Taylor, 2009)<sup>44</sup>. Also, complex financial products might have worsened asymmetric information problems through destroying information about the value of cash flows of underlying assets (Mishkin and Eakins, 2012)<sup>45</sup>. In addition, as Crotty (2009) argues, structured financial products can be inherently non-transparent, which means that they cannot be priced correctly and they are not liquid. According to him, during the boom there was a demand for them, but when it ended, since nobody knew their worth, liquidity and demand vanished, thence their prices plummeted. Besides, CDOs actually re-bundle risks in a more complicated and transparent way, as opposed to the risk distribution function of ABSs (Crotty, 2009).

As a result, there are several mechanisms by which securitization allowed for the accumulation of systemic risks. Through its extensive usage, credit constraints and lending standards declined and it is allowed for the mass production of credit to households. Also, it created incentives to avoid of costly screening and monitoring activities for banks. Moreover, the products of securitization activities became highly appealing for investment and created new markets for the underlying risky loans. In addition, risk evaluation of those complex products became difficult. Considering all these points, securitization had an important role in many of the developments that culminated in the crisis.

---

<sup>44</sup> See section 2.4.2 for more on incentive problems of rating agencies.

<sup>45</sup> Gorton and Metrick (2010:9-10) states that “it can be very difficult to pierce the veil of a CDO and learn exactly what lies behind each tranche. This opacity was a fundamental part of pre-crisis securitization, and was not limited to subprime-based assets.” However, they noted that “such opacity makes these instruments liquid by preventing adverse selection.” Considering this, non-transparency of complex financial products has ambiguous results within the asymmetric information framework.

### 2.2.2.3. Securitization and credit boom

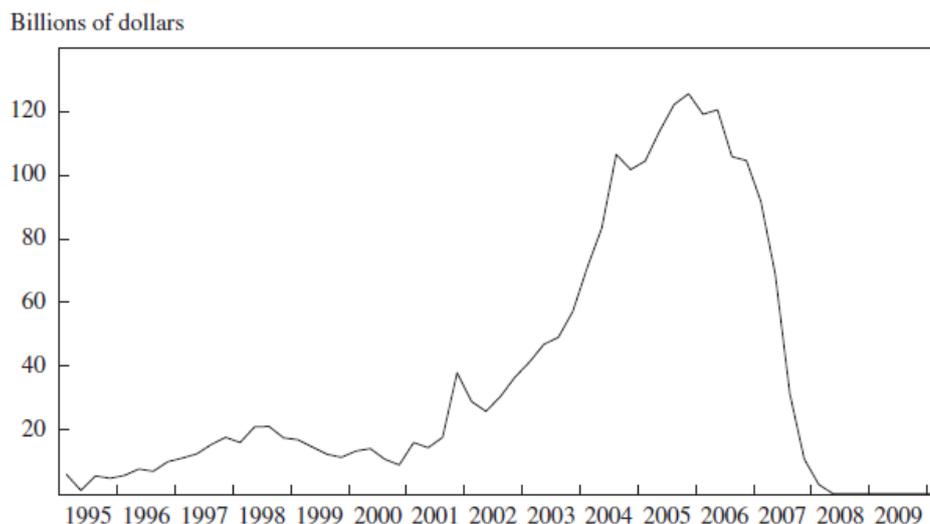
Up to now, we have discussed how securitization and related financial mechanisms increased leverage and created vulnerabilities in the financial system by allowing the exploitation of regulatory arbitrage or the accumulation of systemic risks. Besides, securitization might have played significant role in the emergence of mortgage credit boom and housing price boom. The history of the development of housing finance and the history of securitization give clues about this argument<sup>46</sup>. Nonetheless, we rely on the proposed channels and evidences provided by the empirical literature in this part. In general, we argue that growing securitization of mortgage credits contributed to the credit boom and housing price boom, by mainly relaxing credit constraints or reducing lending standards since it enables mortgage originators to remove illiquid loans and the risks they brought about from their balance sheets (Brunnermeier, 2009; Dell’Ariccia et. al, 2008; Mian and Sufi, 2008).

Firstly, although the start of housing boom and mortgage boom can be traced back to the mid-1990s (see Figure 2.4 and Figure 2.5), they both accelerated during the 2000s with subprime mortgage boom facilitated mainly by securitization. For example, while subprime mortgages originated amounted to \$160 billion in 2001, which was nearly 7 percent of all originations, during the period between 2004 and 2006, subprime mortgage origination reached to nearly \$600 billion and 20 percent of all originations as averages (Lapavitsas, 2009). Moreover, securitization rate of these subprime mortgage increased from 60 percent to 80 percent between 2001 and 2006 (Lapavitsas, 2009). The rapid rise of the amount of subprime MBS issuance after 2002 can be followed from Figure 2.19 below. Moreover, subprime mortgage boom during the 2002-2005 periods was historically unique (Mian and Sufi, 2008)<sup>47</sup>.

---

<sup>46</sup> See Chomsisengphet and Pennington-Cross (2006), Dodd (2007) and Mishkin and Eakins (2012) for historical developments in securitization and housing finance.

<sup>47</sup> Mian and Sufi (2008: 11-12) show that while the relative growth rate of the number of mortgages directed to subprime regions remained flat or slightly increased from 1992 to 2002, it became 35 percent higher in subprime regions relative to prime ones from 2002 to 2005.



Source: *Inside Mortgage Finance*.

2.19 Issuance of Subprime Mortgage-Backed Securities, 1995-2010, Quarterly data, seasonally adjusted.

Source: Greenspan (2010a:206)

We argue that one of the most important components of subprime mortgage boom was securitization. Subprime mortgage boom might have been mainly driven by supply-side developments related with securitization. Although increasing demand for subprime MBSs from financial institutions and investors might have also been important in the emergence of subprime mortgage boom, here we do not compare their relative weight in the emergence of boom. The comparison here considers the demand-side of subprime mortgages, i.e. households, not the demand-side of subprime- MBSs.

Supply-side developments of subprime mortgage boom include declining credit constraints, deterioration of lending and underwriting standards, and the avoidance of costly screening activities throughout the 2001-2007 periods (Dell’Ariccia et. al., 2008; Demyanyk and van Hemert, 2008; Mian and Sufi, 2008). Dell’Ariccia et. al. (2008) shows that delinquency rates of mortgages at the end of the boom was larger in those areas that experienced larger expansion of mortgage loans, which have witnessed much more decline in lending standards, measured by both decreasing

denial rates and increasing loan-to-income ratios. Mian and Sufi (2008) test the hypothesis that an outward shift in the supply of mortgages by lenders due to a decline in risk premiums would be more influential on lending to subprime borrowers relative to prime ones. In order to support this hypothesis, they show that credit constraints (measured by denial rates) eased after 2002 for both prime borrowers and subprime borrowers, but disproportionately in favor of subprime borrowers. Considering also the decrease in the spread of subprime and prime interest rates after 2002, they argue that relaxation of credit constraints imply a shift in mortgage supply curve that would favor subprime borrowers more<sup>48</sup>. In support of this argument, Demyanyk and van Hemert (2008), show that the subprime-prime spread declined much more and more steadily than the corporate BBB-AAA yield spread between 2001 and 2004. This means “the decline [of the subprime premium] cannot just be attributed to a change in the overall level of risk aversion” (Demyanyk and van Hemert, 2008:30)<sup>49</sup>.

Moreover, these special supply-side developments were mostly related with the extensive use of securitization. The expansion of mortgage securitization during the 2002-2005 periods coincides with the increasing fraction of mortgages sold to non-GSE financial institutions (see Figure 3.12 above). Mian and Sufi (2008) approves this with micro-level data<sup>50</sup>. Moreover, since Mian and Sufi (2008) display the

---

<sup>48</sup> “[T]he subprime mortgage market actively price discriminates (that is, it uses risk-based pricing) on the basis of multiple factors: delinquent payments, foreclosures, bankruptcies, debt ratios, credit scores, and LTV ratios. In addition, stipulations are made that reflect risks associated with the loan grade and include any prepayment penalties, the length of the loan, the flexibility of the interest rate (adjustable, fixed, or hybrid), the lien position, the property type, and other factors” (Chomsisengphet and Pennington, 2006: 36). Considering all these points about the determination of interest rates on subprime mortgages and about the stipulations that determine the credit constraints, those two indicators indeed imply that mortgage supply curve, especially its subprime segment, was very likely to shift.

<sup>49</sup> In general, Demyanyk and van Hemert (2008) also approve the existence of deterioration in lending standards (indicated by increasing combined loan-to-value ratio and the fraction of low documentation loans over time) and they conclude that “the rise and fall of the subprime mortgage market follows a classic lending boom-bust scenario, in which unsustainable growth leads to the collapse of the market” (Demyanyk and van Hemert, 2008:5).

<sup>50</sup> They show the existence of “the relative growth in mortgages sold to non-GSE investors for subprime versus prime zip codes. The six percentage point relative increase from 2002 to 2006 in subprime zip codes is 1.5 standard deviations of the 2001 level” (Mian and Sufi, 2008:25).

existence of simultaneous reverse movements of mortgage debt and non-mortgage debt for subprime regions from 2002 to 2005, it can be argued that “[g]iven that securitization advancements are concentrated in the subprime mortgage market from 2002 to 2005 ... [these developments suggest] that the pattern is driven by a mortgage credit specific supply shift” (Mian and Sufi, 2008: 28). Also, Dell’Ariccia et. al. (2008) finds supportive evidence on the effect of securitization on relaxation of lending standards, thence on the credit boom. They show that those areas with the higher proportion of mortgage loans sold for securitization purposes within one year from origination experienced a significant decline in denial rates. Furthermore, their analyses shows that while this effect was more pronounced in prime markets during the 2000-03 periods, it became more pronounced in the subprime mortgage markets for the 2004-06 periods. In addition, they show that securitization contributed to increase in loan-to-income ratios (considered as another measure of lending standards) especially for the second period<sup>51</sup>.

Besides Keys et. al. (2008) shows evidence on that securitization contributed to lax screening on the part of mortgage originators. Moreover, their analysis also shows that differences in performance of loans resulted from the different attitude of lenders towards different borrowers with different credit scores. Ease of securitization above 620-credit-score- threshold created incentives for lenders to screen these loans less carefully, while these lenders were more careful about those 620- loans that would possibly get stuck on their balance-sheets for a long-time (Keys et. al. 2008). As a result, this study shows that securitization contributed to credit boom by allowing striking increases in mortgage origination at certain credit score thresholds. Moreover, by reducing screening incentives, securitization also prepares the ground for the downfall of these loans.

Finally, Loutskina and Strahan (2008) show that neither balance-sheet liquidity nor cost of deposits matters for originating non-jumbo mortgage loans, which could

---

<sup>51</sup> Thus, considering these result, they conclude that “securitization provides lenders with incentives to extend riskier loans” and it has contributed to declining lending standards, thence to credit boom (Dell’Ariccia et. al., 2008:17).

easily be securitized; while these funding constraints matter for originating jumbo loans that could not be easily sold in the secondary market. Since securitization makes balance-sheet of mortgage originators more liquid by allowing transferring once-illiquid loans to securitization vehicles, funding constraints were reduced for the loans that could easily be sold to securitization vehicles in the whole banking sector uniformly (Loutskina and Strahan, 2008). However, funding constraints were in force for the origination of loans that could not easily be sold for securitization, because the originator bank should finance illiquid loans by its own sources (Loutskina and Strahan, 2008)<sup>52</sup>.

Besides these cases for the role of securitization and supply-side developments in mortgage boom, what was the role of demand-side factors should be analyzed. In this respect, Mian and Sufi (2008) test “income-based hypothesis”, which implies that an improvement in the creditworthiness of subprime borrowers due to relative income growth or relatively well business conditions for subprime regions might have contributed to the subprime mortgage boom. However, they find that mortgage origination growth was relatively higher for subprime regions, although they experienced relatively low growth and employment and business opportunities relative to prime regions for 2002-2005. Even, subprime regions with absolute negative income growth experienced higher mortgage growth than that of prime regions with positive income growth in the same county, according to Mian and Sufi (2008)<sup>53</sup>. In addition, Mian and Sufi (2008) argue that business conditions, -i.e. a recovery period after 2001 and low risk-free interest rates – does not explain subprime growth phenomenon, because of two empirical facts. First, although the US economy experienced a similar recovery and “low risk-free-rate period”, from 1990 to 1994, it resulted in the relative decline in mortgage origination for subprime

---

<sup>52</sup> Thus, they conclude that “increasing depth of the mortgage secondary market fostered by securitization has reduced the effect of lender financial condition on credit supply” (Loutskina and Strahan, 2008).

<sup>53</sup> Moreover, they find that “2002 to 2005 is the *only* period in the last eighteen years when credit growth is negatively correlated with income growth” (Mian and Sufi, 2008:18, emphasis in original).

zip codes<sup>54</sup>. Second, for the 2002-2005 periods, non-mortgage debt balances of households in subprime zip codes declined relatively despite favorable interest rates.

On the other hand, Dell’Ariccia et. al. (2008) finds ambiguous results on the role of macroeconomic factors in the emergence of credit boom accompanying with declining lending standards. By putting income and employment related variables as control variables into the model, they find that except average income, they are mostly insignificant considering denial rates as the measure of lending standards. However, according to Dell’Ariccia et. al. (2008), unemployment, self-employment and average income matters for loan-to-income ratios –the other measure of lending standards in this study. Therefore, there might have been a little role for demand-side factors. In fact, one of the most important shortness in the analysis of Mian and Sufi (2008), who strongly make a case for the weight of supply-side developments, is that they only focus on mortgages for home-purchasing and not for refinancing of existing loans. According to Chomsisengphet and Pennington-Cross (2006:38), “[i]n environments of low and declining interest rates, such as the late 1990s and early 2000s, cash-out refinancing becomes a popular mechanism for homeowners to access the value of their homes. In fact, slightly over one half of subprime loan originations have been for cash-out refinancing.” Considering all these, macroeconomic factors and demand side factors might still have been important. Nonetheless, it is fair to argue that income-based explanations and macroeconomic-conditions-based explanations to the subprime mortgage boom seem weaker than supply-based explanations.

Finally, we argue that housing price boom was partly related with subprime mortgage boom and can be explained by mortgage boom. Dell’Ariccia et. al (2008) finds that denial rates falls in the case of faster housing price appreciation in both markets, but more pronouncedly in subprime markets. Moreover, they show that

---

<sup>54</sup> Mian and Sufi (2011:22) states that “[t]hese findings contradict the hypothesis that a sharp drop in risk free rates mechanically causes an expansion in mortgage credit to subprime areas”. These findings will also make our conclusions about the role of monetary policy more robust. Also, they will be in dispute with some of the arguments about global imbalances.

loan-to-income ratios increase significantly only in subprime markets with housing price appreciation. Reminding the decline in lending standards was related to mortgage boom, these support the correlation between housing price boom and the credit boom. Also, these evidences display the effect of housing prices over the credit boom, especially for the subprime market. On the other hand, Mian and Sufi (2008) test the effectiveness of housing prices on credit boom by using a subsample of their dataset, which consists of only those regions with the highest housing supply elasticity. As expected, they show that house price growth in these regions remained flat and close to the rate of inflation for all periods, whereas there was a significant upward trend in house price growth for supply-inelastic regions from 2002 to 2005. Nevertheless, their key results related with income, mortgage growth, securitization and default rates hold even in these highly supply-elastic regions. This means that the evidence “disputes the hypothesis that house price expectations are uniquely responsible for the expansion in credit to subprime borrowers from 2002 to 2005” (Mian and Sufi, 2008:31). Besides, Mian and Sufi (2008) show that housing prices not only increased in the national-level, but also increased disproportionately in the subprime regions which have experienced much more mortgage boom. Although these evidences are not enough to draw conclusions about the direction of ultimate causality between the mortgage boom and housing price boom, it seems that mortgage boom was the underlying cause of the housing price boom and they fed into each other throughout the process (Mian and Sufi, 2008)<sup>55</sup>.

All in all, the evidence presented in this part provides quite strong support to the role of securitization in the crisis. With its contribution to the liquidity in secondary markets, it provides liquidity in the mortgage market and balance-sheet of the mortgage originators, too. Thus, by creating incentives to reduce credit constraints, lending standards and lax screening, especially for the subprime mortgage market, securitization might have been one of the most significant factors that contributed to

---

<sup>55</sup> They conclude that “[w]hile further research is needed to isolate causality in a more convincing manner, the evidence suggests that the expansion of mortgage originations in subprime zip codes, driven by securitization, may itself be responsible for the relative house price growth in subprime areas” (Mian and Sufi, 2008:32).

mortgage lending boom. Moreover, the studies covered in this part show that income and employment conditions or risk-free interest rates, thence monetary policy have weak explanatory power for the special growth of subprime mortgage market. What is more, the study of Loutskina and Strahan (2008) has an important implication on the role of monetary policy. If funding constraints have been less effective in the decision of mortgage origination for the whole banking sector uniformly because of securitization, it could be argued that bank lending channel, which works through the ability of central banks in raising funding costs, so making credit supply difficult, should have weakened throughout the process (Loutskina and Strahan, 2008)<sup>56</sup>. Finally, although the evidence is not enough to draw robust conclusions, Mian and Sufi (2008) show some evidence on that the ultimate causality runs from credit boom to housing price appreciation, despite the existence of feedback between them throughout the process. Hence, putting all pieces together, it seems that growing securitization of mortgages and especially subprime mortgages contributed to mortgage credit boom and to housing price boom. Also, by creating incentives to relaxing credit constraints, reducing lending standards, relaxing screening on the part of mortgage originators, it has sown the seeds of downfall throughout the process.

### **2.3. The role of Leverage and Self-Reinforcing Mechanisms of Finance**

Leverage measures how much money is put by a borrower according to the value of an asset while paying the remaining amount of the asset through borrowing; or in short, it is the ratio of the value of an asset to the equity. In this section, we use several terms, as did by Geanakoplos (2009, 2010), to imply leverage. These words are leverage, margin (synonymously, haircut or down payment), collateral rate and loan-to-value ratio (LTV). Let us say that asset price is  $P$  and borrower take  $L$  amount of loan using the asset as collateral against it. Then, these terms represent the followings: loan-to-value ratio,  $LTV = \frac{L}{P}$ ; and collateral rate =  $\frac{P}{L}$ , which is the

---

<sup>56</sup> Loutskina and Strahan (2008: 4) states that “[t]he results also suggest that expansion of the secondary market in mortgages has dampened the effects of monetary policy on real economic activity.”

inverse of loan-to value ratio and is equal to  $\frac{1}{LTV}$  ; and margin =  $\frac{P-L}{P}$  , which is equal  $1 - LTV$ ; and finally, leverage =  $\frac{P}{P-L}$  , which is the inverse of margin and is equal to  $\frac{1}{1-LTV}$ . Why leverage matters so much can be understood with the following example: when someone borrows \$80 for purchasing home with a value of \$100, then LTV ratio will be 0.8, margin will be 0.2, and finally, leverage will be 5. This means that when the housing price increase to \$110 from \$100, this %10 increase in house price will bring about five times more return in percentage points, because after paying out the loan, borrower will be left with \$30 and will get %50 percent return to his/her investment, which was \$20 initially. Moreover, when an asset price plummeted and reached near zero, the more the borrower is leveraged, the less s/he will lose and the more the lender will lose.

In the context of the crisis, leverage matters because the level of leverage determines partly the extent and depth of the deleveraging process. As Greenspan (2010a) stated, the degree of leverage may make some bubbles more severe and lead to long-lasting debt-deflation process. Besides, as shown by Demyanyk and van Hemert (2008), although loan and borrower characteristics are important in explaining cross-country differences in mortgage defaults before the financial crisis, since these characteristics changed little in 2006 and 2007, their contribution to increasing probability of delinquency of vintage 2006 and 2007 loans remains weak and they could not explain very poor performance of these loans. They find that one of the most important variables that contributed to increasing delinquency of vintage 2006 and 2007 loans is increased loan-to-value ratio (or household leverage) (Demyanyk and van Hemert, 2008)<sup>57</sup>. Moreover, Demyanyk and van Hemert (2008) show that household leverage was increasingly interacted with mortgage interest rates in the run-up to the crisis, contributing to their increase.

---

<sup>57</sup> Besides, low house price appreciation, high mortgage interest rates and lowering credit score of borrowers are other important determinants of increasing probability of default of vintage 2006 and 2007, according to this research. However, they clearly state that their findings show also that “the effect of different loan-level characteristics as well as low house price appreciation was quantitatively too small to explain the poor performance of 2006 and 2007 loans” (Demyanyk and van Hemert, 2008:5).

On the other hand, despite the general agreement on the importance of leverage as an indicator of risks in the financial system, there is not agreement on the level of it before the crisis. As we showed in the previous section, there is evidence on large banks' exposure to excessive leverage through their off-balance sheet mechanism (see Acharya and Schnabl, 2008). In addition, Merrouche and Nier (2010) find that there exist substantial correlation (50 percent and statistically significant at the 5 percent level) between the leverage of banks (measured by credit to deposit ratio in order to provide a measure for the level of leverage through only wholesale funding markets) and growth of housing prices for a sample of 22 OECD countries during the 1999-2007 periods. On the other hand, as we will show below, some finds that while commercial banks' leverage did not increase before the crisis, only investment banks became increasingly leveraged (Adrian and Shin, 2010; Kalemli-Ozcan et. al, 2012).

The debate over leverage is linked to the self-reinforcing mechanisms of finance, which were very likely to overextend and intensify both boom and bust periods. The interaction of several variables with housing prices and, in general, asset prices might have contributed to the severity of the recent crisis through creating self-reinforcing feedback mechanisms. Some of such mechanisms were mentioned in the first section, such as the tightening of margins and asset price deceleration. More theoretical explanations will be covered in this section. Accordingly, in the following part, we will provide some arguments about these self-reinforcing mechanisms. In the same part, the evidences about financial sector leverage will be covered when appropriate. Then in the second part, we will provide the fundamentals of "leverage cycle theory", proposed by Geanakoplos (2009), which tries to introduce a complete explanation for the recent crisis. Although, "leverage cycle theory" is also based on self-reinforcing mechanisms of finance, since it provides an integrated explanation for both boom and bust periods which tries to cover all the prominent phenomena of the 2000s, we will analyze it separately. Finally, we will draw attention to the role of regulations and politics in the emergence excessive leverage and more powerful self-reinforcing feedback mechanisms.

### 2.3.1. Self-Reinforcing Mechanisms of Finance and Empirics about the Leverage in Financial Sector

Firstly, we will cover the interaction between asset prices, balance-sheet size and leverage, relying on a famous article of Adrian and Shin (2010). They analyze the reactions of financial intermediaries to the changes in their net worth, in general. It is observed that balance-sheets (hereafter, BS) of large financial firms, so their net worth, is highly affected by asset price fluctuations due to the embracement of continuously marked-to-market accounting by these firms, especially by investment banks (Adrian and Shin, 2010).

Leverage is, by definition, inversely related with asset prices. (Leverage is equal to  $\frac{1}{1-LTV} = \frac{1}{1-(L/p)}$ , so when asset price increases leverage declines, holding the value of loan constant.) However, as noted by Adrian and Shin (2010), this materializes only when borrower passively reacts to the changes in asset prices and their effects on his/her BS and net worth. Adrian and Shin (2010), relying on the US Flow of Funds data from 1963 to 2006, find that leverage growth and total asset growth (BS growth) of commercial banks correlated with a vertical line that passes through zero change in leverage, i.e. commercial banks target and fix their leverage ratio and reacts to total assets' growth according to this target. Moreover, for securities broker-dealers, they find a positive correlation, i.e. they react to changes in total assets by adjusting their leverage in the same direction. Relying on the latter evidence, they state that "leverage is procyclical" (Adrian and Shin, 2010: 421).

What happens if leverage is procyclical is the main question. Consider the example of targeting and fixing leverage at 5, for the sake of simplicity<sup>58</sup>. Let the BS of a commercial bank include an asset worth \$100 and debt worth \$80; so its net worth is \$20 and leverage is 5. Assuming that the price of debt is constant, when the asset price increases by 5 percent, assets-side of BS becomes \$105. Immediately, net worth increases by 25 percent and becomes \$25. The leverage immediately falls to

---

<sup>58</sup> This paragraph mostly draws on Adrian and Shin (2010).

$105/25 = 4.2$  from its initial level, 5. Since the bank targets leverage of 5, then it takes on additional debt in order to invest in assets and to reach its target leverage. Accordingly, the amount of debt,  $D$ , will be equal to 20 in this case, by the equation:  $5 = (105 + D)/25$ . As a result, holding leverage constant, a 5 percent increase in asset prices increases the balance-sheet size 25 percent, i.e. BS increases by target leverage times the growth in asset prices. As a corollary, it follows that when asset prices fall, BS will be shrunk disproportionately again. Also, when the leverage is adjusted in the same direction with the changes in total assets (procyclical leverage) instead of targeted at fix level, the reaction of banks to asset prices are getting stronger (Adrian and Shin, 2010). What is more, as we will discuss below, since there exist possible mechanisms, by which increasing leverage or BS size drives asset prices upward, then asset prices and leverage or BS expansion will reinforce each other. Adrian and Shin (2010:423) proposes an example of such mechanisms between BS size and asset prices: “[i]f financial markets are not perfectly liquid so that greater demand for the asset tends to put upward pressure on its price, then there is the potential for a feedback effect in which stronger balance sheets feed greater demand for the asset, which in turn raises the asset’s price and lead to stronger balance sheets.”

The procyclicality of leverage for the (then) five biggest investment banks of the US is further confirmed by Adrian and Shin (2010) with a bank-level analysis and quarterly data for the recent period (from the 1990s-different for each of those banks-to 2008Q1). Moreover, Kalemli-Ozcan et. al. (2012), relying on bank and firm-level data sets for the period between 2000 and 2009, shows that leverage is procyclical for all the securities broker-dealers of the US, and for “large” commercial banks, too, i.e. those who have total assets more than one billion dollars worth. Their findings also show that when all commercial banks or non-financial firms are considered, there is no sign of procyclicality of leverage.

Kalemli-Ozcan et. al. (2012) shows that leverage increased after 2004 for all securities brokers-dealers (see the top two panels of Figure 2.20). Moreover, they show that aggregate series of leverage are driven by the largest investment banks,

since they show that median leverage for all securities broker-dealer has actually fallen steadily after 2004. Also, Adrian and Shin (2010) provides a picture of the average leverage for the five biggest investment banks (see the bottom panel of Figure 2.20), which confirms the foregoing interpretation. Finally, Kalemli-Ozcan et. al. (2012) shows that the level of leverage remains roughly stable for all commercial banks, even for large commercial banks, during the 2000s (see the top two panels of Figure 2.20).

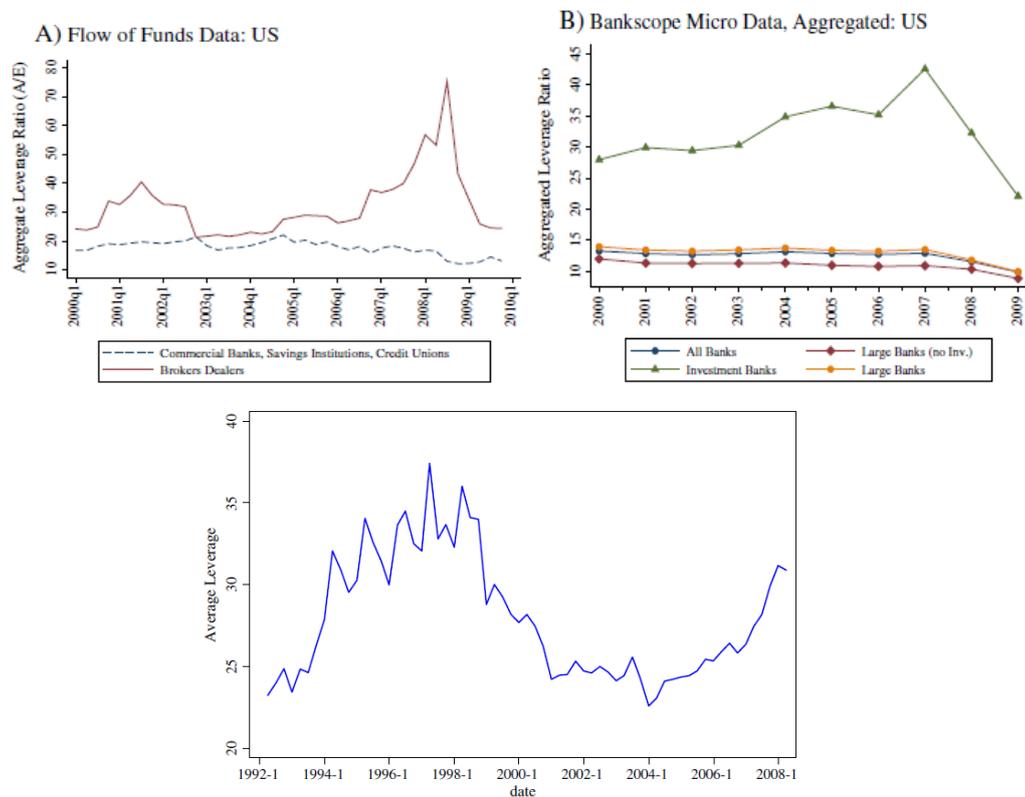


Figure 2.20 Leverage in the US financial sector

Sources: Kalemli-Ozcan et al 2012: 290; Adrian and Shin (2010: 433)

Notes: The top two figures belong to Kalemli-Ozcan et. al., while the latter belongs to Adrian and Shin. For the top two figures, the authors use different data sets and make different aggregations. The latter one measures only the average leverage of the five biggest investment banks of the US for the 1992-2008 periods.

To get a more detailed picture about the leverage of commercial banks, Kalemlı-Ozcan et. al. (2012) investigates guarantees and committed credit lines provided for off-balance-sheet vehicles by commercial banks (their analysis does not include off-balance-sheet vehicles of investment banks). In Figure 2.21 below, it can be seen that guarantees and committed credit lines as a percentage of bank assets remains roughly stable at above 80 percent level for large commercial banks and at above 70 percent level for all commercial banks. Relying other figures and the researches of Acharya and Schnabl, Kalemlı-Ozcan et. al. (2012) argues that deleveraging process of these banks mostly linked to their off-balance-sheet exposures, which can also be seen from declining ratio of guarantees to assets during the crisis while these banks take those assets of conduits back to their balance sheets. Nonetheless, they state that there was no sign of increasing risks arisen from guaranteeing conduits before the crisis, because of the stable ratio of guarantees to assets. They (2012: 291) conclude that “outside of investment banks neither leverage nor guarantees and committed credit lines relative to assets (or equity) signaled excessive risk taking over time in the run-up to the crisis. It appears that the increasing risk exposure of commercial banks in 2004–2007 was hidden in the deteriorating quality of the asset pool.”

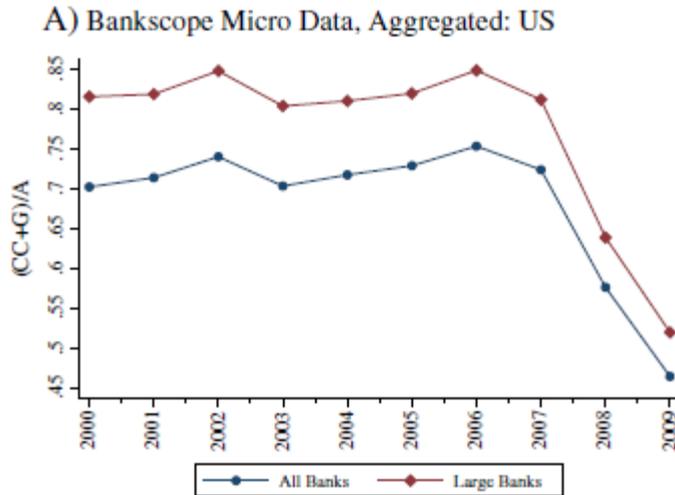


Figure 2.21 Guarantees and Committed Credit Lines as percentage total assets for the US banks, 2000-2009

Source: Kalemli-Ozcan et al. (2012: 291)

Notes: Investment banks are not included since they do not report guarantees and credit lines they provided for their off-balance sheet vehicles. Large bank represents those that have more than one billion dollars worth of assets in 2000.

However, we think that some other evidences show that there were signs of increasing risk related with off-balance-sheet. As shown by Kalemli-Ozcan et. al. (2012), total assets of US banks (commercial, saving institutions, credit unions) doubled between 2000 and 2008, from \$6 trillion to \$12 trillion roughly, according to flow of funds data. More interestingly, it seems evident from the analysis of Kalemli-Ozcan et. al. (2012) that large banks created this pattern. On the other hand, they show that median levels of guarantees and committed credit lines to assets for both large banks and total banks are very small according to the aggregate levels, such as, median ratio was between 0.18 and 0.24 for large banks and it was around 0.08 for all banks during 2000-2007. All these imply that only those large banks heavily relied on off-balance sheets while their balance-sheets and total assets were expanding rapidly. Thus, the stable ratio of guarantees to assets only implies that guarantees grew hand-in-hand with total assets. Since guarantees provided for conduits represented much smaller regulatory capital relative to on-balance-sheet

regulatory capital, this implies that *the extensity* of higher effective leverage increased with growing total assets, because they were held in off-balance-sheet vehicles. Hence, there were signs of growing vulnerabilities.

Now we turn to the question of which mechanisms explain the adjustment of leverage with asset prices. According to Adrian and Shin (2010)'s econometric analysis on the determinants of the change in leverage for the five biggest investment banks, lagged leverage (previous quarter's leverage) and Value-at-Risk (VaR) are negatively related with leverage, while on the other side, repos are positively related with leverage. Moreover, they show that there exist a very high correlation between total asset growth and repo growth rates. Relying on this, they (2010: 429) argue that "changes in leverage are achieved through expansions and contractions in the collateralized borrowing and lending." However, short-term borrowing mechanisms are just the way these banks adjust their balance-sheet expansion and leverage. The source of procyclical leverage was the active management of balance-sheets according to perceived risks and changes in prices, according to Adrian and Shin (2010). Since these investment banks and large banks used Value-at-Risk (VaR)<sup>59</sup> method, so they relied on perceived risks while managing their capital structure and determining how much equity capital should be held, they adjust their equity – thence, leverage- according to perceived risks. Then, it follows that if a bank targets its risk exposure and uses VaR to adjust its equity capital, leverage will be high (equity capital will be low) during booms since perceived risks are low, and leverage will be low (equity capital will be high) during a turmoil in markets since perceived risk is high (Adrian and Shin, 2010).

Besides, there are other possible mechanisms that contribute to procyclicality of system-wide leverage or procyclicality of total asset growth. For example, under a realistic assumption of "a world of uncertainty" that we live in, risk aversion, expectations and liquidity are endogenous and they can be adjusted according to the

---

<sup>59</sup> "VaR is an estimate of a financial institution's worst case loss and is usually defined with respect to a confidence level of, say, 99%. VaR is defined such that the probability that losses on the asset portfolio exceed the value VaR is less than 1%." (Kalemli-Ozcan et. al., 2012: 286).

stages of cycles (Crotty, 2009). The boom and bust periods create, then, more optimistic and more pessimistic investors, respectively, which, in turn, feed into the movement of prices and reinforce the effects of such movements. In a similar way, liquidity in financial markets is adjusted according to the boom and bust periods. In addition, according to Bernanke (2010b), since financing patterns are procyclical too, they contribute to the rise in leverage during booms. He states that assets of hedge funds, securities broker-dealers, and other similar entities “are primarily marketable securities, and much of their financing is in the form of repos. When times are good, the value of the assets rises and repo lenders impose smaller haircuts on the collateral, allowing more securities to be financed by a given amount of repo borrowing--effectively, an increase in leverage” (Bernanke, 2010b).

Finally, balance-sheet contraction, dry-up of market liquidity and deleveraging during the crisis were interacted with asset prices. Brunnermeier (2009) differentiates two different levels of self-reinforcing asset price decline during a bust period<sup>60</sup>. At first level, which is called “loss spiral”, decline in asset prices reduces the net worth of financial firms much faster than their total assets because of their leveraged position. This reduction in their net worth will reduce the amount they can borrow and their balance-sheet even in the case of stable margins (haircut) in short-term borrowing markets. It is so, because financial firms that kept their leverage fixed should react to decline in net worth by reducing their total assets. This forced sale depresses asset prices further and brings about more selling since other potential buyers of assets face also similar pressures at the same time or “because other potential buyers find it more profitable to wait out the loss spiral before reentering the market” or “other traders might even engage in ‘predatory trading’ deliberately forcing others to liquidate their positions at fire-sale prices” (Brunnermeier, 2009: 92-3). In the second level, which is called “margin/haircut spiral”, rising margins enforce financial firms to sell even more and this enhances the loss spiral. When margins/haircuts rise in short-term funding markets, it directly requires decreasing leverage in the balance-sheet of financial firms, because assets on the balance-sheet

---

<sup>60</sup> This paragraph draws on Brunnermeier (2009).

will now bring less funding in a collateralized short-term borrowing. This means that financial firms should either raise its equity to hold the same amount of asset or sell some of them, thence financial firms should deleverage. Again, forced selling decreases asset prices further instead of creating cheap buying opportunities during the crisis. Moreover, this time forced selling increases margins further and brings about much more deleveraging. According to Brunnermeier (2009), there are three reasons for the rise of margins. First, “unexpected price shocks” create expectations about higher future volatility, which, in turn, brings about uncertainty about the asset price, so raises margins. Secondly, since lenders in the short-term markets fear about accepting bad assets as collateral and since they do not know which assets are bad (due to asymmetric information), this will dry up the funds for even those potentially good assets, too. Finally, when lenders use past data in order to estimate future volatility, the large drop in an asset price, even if it was only temporary, will reflect itself in expected future volatility, which increases margins in the end.

All in all, it seems explicitly that leverage was increasing in the large investment banks in the run-up-to the crisis. Although commercial banks’ leverage was stable before the crisis, some mechanisms, such as off-balance-sheet vehicles, might have obscured the true level of leverage, especially for the large commercial banks that were able to establish such vehicles. They are several self-reinforcing mechanisms of finance that works through the interaction of leverage, balance-sheet size, net worth, asset prices and market psychology, which enhance the boom conditions and exacerbate the suffering during the crisis. Firstly, as the foregoing arguments and evidences showed, for the largest banks and investment banks, the active management of balance-sheet and equity capital according to market prices of assets and perceived risks, brought about either procyclical balance-sheet size or procyclical leverage. Asset price changes immediately influence on the net worth of these large banks and since they targeted either their risk-based equity capital or their leverage ratio, an asset price increase brings about “surplus capital” in either case. In order to utilize this surplus capital, these banks should expand their balance-sheets; so, relying on the short-term debt, they actively search for potential borrowers. As aptly put by Adrian and Shin (2010: 436), “[i]n the sub-prime mortgage market in

the United States we have seen that when balance sheets are expanding fast enough, even borrowers that do not have the means to repay are granted credit – so intense is the urge to employ surplus capital. The seeds of the subsequent downturn in the credit cycle are thus sown.” Secondly, it is highly likely to be that risk aversion, market liquidity, expectations and funding patterns are procyclical, too. These, in turn, might have been contributed to system-wide leverage. Finally, the interaction between asset prices and net worth of financial firms exacerbate the contraction of balance sheets during the crisis. Also, rising margins (haircuts) due to sharp and unexpected price decline create a vicious cycle between increasing margins and deleveraging.

### 2.3.2. “Leverage Cycle Theory”

The previous part shows that asset prices might have an influence on leverage of financial firms through changing their net worth. Although it was touched upon that leverage also can have an effect on asset prices, Geanakoplos (2010) proffers much more explicit and widespread mechanism. Moreover, his theory encapsulates the whole story of the crisis in the movements of leverage. In this part, we will elaborate on his influential and inspiring theoretical approach to the crisis, which is called “leverage cycle theory”. Geanakoplos (2009; 2010) proffers that the recent crisis was the low end of a “leverage cycle”, by which he means that asset prices rise when leverage is high and they fall when leverage is low. Relying on the intuition that supply and demand for a loan or an asset can determine actually both its interest rate and its leverage (or margin, LTV ratio) in everyday life<sup>61</sup>, he argues that variations in

---

<sup>61</sup> Geanakoplos (2009: 1; 2010:102) states that “the more impatient borrowers are, the higher the interest rate; the more nervous the lenders become, the higher the collateral they demand”; and more generally “the interest rate reflects the underlying impatience of borrowers, and the collateral rate reflects the perceived volatility of asset prices and the resulting uncertainty of lenders”. For examples, Geanakoplos (2010: 103) states that “[a] potential homeowner who in 2006 could buy a house by putting 3 percent cash down might find it unaffordable to buy now that he has to put 30 percent cash down, even if the Fed managed to reduce mortgage interest rates by 1 percent or 2 percent. This has diminished the demand for housing, and therefore housing prices. What applies to housing applies much more to the esoteric assets traded on Wall Street (such as mortgage-backed investments), where the margins (that is, leverage) can vary much more radically. In 2006, the \$2.5 trillion of so-called toxic mortgage securities could be bought by putting \$150 billion down and borrowing the other \$2.35 trillion. In early 2009, those same securities might collectively have been worth half as much, yet a buyer might have had to put nearly the whole amount down in cash.”

leverage heavily influence on asset prices, like simply done by the variations in interest rate. He (2009:2) explains the interaction of leverage and asset price with “marginal buyer theory”, which assumes heterogeneous buyers and that “for many assets there is a class of buyer for whom the asset is more valuable than it is for the rest of the public”, as opposed to the assumption of mainstream theory on the existence of a fundamental value for an asset<sup>62</sup>. According to marginal buyer theory, some buyers may have a willing to pay more for a certain asset because of many reasons and when they access to more money in a highly leveraged way, they will purchase that asset and drive its price up. On the other hand, when they are not able to borrow against that asset because of higher margins, they will not purchase it or they will sell it, driving the price down<sup>63</sup>. As a result, Geanakoplos (2009:2) gives a theoretical form to a simple observation “[i]n the absence of intervention, leverage becomes too high in boom times, and too low in bad times. As a result, in boom times asset prices are too high, and in crisis times they are too low. This is the leverage cycle”.

Alongside the other factors that affect margins, down-payments or haircuts (in general, leverage) at a given time, such as financial innovations, a leverage cycle is basically considered as a self-reinforcing dynamic that starts with “good news” about the economy or optimistic future expectations. Beside its direct effects on asset prices, “good news” encourages lenders to reduce margins, so optimistic borrowers (natural buyers) increase their leverage and drive asset prices up. In this basic framework of leverage cycle theory, “bad news” creates a tendency to fall in asset

---

<sup>62</sup> Geanakoplos’ approach sees borrowers (buyers) as the optimists and lenders as the pessimists. He (2010:104-105) states that “[l]enders are typically more pessimistic than buyers. Otherwise, they too would be buying, instead of lending” and “[w]ithout heterogeneity among investors, there would be no borrowers and lenders, and asset prices would not depend on the amount of leverage in the economy.”

<sup>63</sup> For better understanding, consider the following abstraction: “the potential investors arrayed on a vertical continuum, in descending order according to their willingness to buy, with the most enthusiastic buyers at the top” Then, [w]hatever the price, those at the top of the continuum above a threshold will value the asset more and become buyers, while those below will value it less and sell. The marginal buyer is the agent at the threshold on the cusp of selling or buying and it is his opinion that determines the price. The higher the leverage, the smaller the number of buyers at the top required to purchase all the available assets. As a result, the marginal buyer will be higher in the continuum and therefore the price will be higher” (Geanakoplos, 2010: 103).

prices by itself and they may further affect asset prices through tightening margins (declining leverage). However, Geanakoplos (2010) notes that despite the frequency of “bad news”, they rarely affect margins and leverage. Therefore, he conceptualizes “scary bad news” in order to refer bad news that increase uncertainty and disagreement about the future, by which margins shoot up since lenders become much more pessimistic about the future and drive the asset prices further down (Geanakoplos, 2010:104)<sup>64</sup>. He (2010: 109) states that “[t]he point of my theory is that the fall in prices from scary bad news is naturally going to be out of proportion to the significance of the news, because the scary bad news precipitates and feeds a plunge in leverage. A change in volatility, or even in the volatility of volatility, is enough to prompt lenders to raise their margin requirements.” Moreover, such a sharp increase in margins and declining asset prices at the same time force even those moderately or less leveraged buyers to sell their assets, which, in turn, drives asset prices downward more since the once-optimists (buyers) now become “forced sellers”.<sup>65</sup> As a result, deleveraging and declining asset prices will reinforce each other until some investors are eliminated and financial markets are tranquilized.

---

<sup>64</sup> Gorton and Metrick (2010), relying on the econometric analysis about the determinant of repo spreads and repo haircuts during the crisis, state that “[t]he key finding here is that both repo spreads and repo haircuts rose during the crisis, with these increases correlated either to concerns about counterparty risk (for spreads), or to uncertainty about collateral values (for haircuts). While these results are somewhat different for spreads and haircuts, we suspect that this system is jointly determined, and that a disruption in the interbank market and increases in uncertainty about collateral are both necessary conditions for a run on repo. In an environment with no counterparty risk, there is no reason to expect haircuts to be affected by uncertainty about collateral; similarly, high counterparty risk by itself would be unlikely to affect repo spreads if all collateral had fixed values and liquid markets. It seems ... [that] all of these things happened at the same time, and it is not possible to disentangle the exact causes.”

<sup>65</sup> In a detailed and refined way, Geanakoplos (2009: 8) depicts the “anatomy of a crash” in the following way: “i) Assets go down in value on scary bad news”; “ii) This causes a big drop in the wealth of the natural buyers (optimists) who were leveraged. Leveraged buyers are forced to sell to meet their margin requirements”; “iii) This leads to further loss in asset value, and in wealth for the natural buyers”; iv) Then just as the crisis seems to be coming under control, margin requirements are tightened because of increased uncertainty and disagreement”; “v) This causes huge losses in asset values via forced sales”; “vi) Many optimists will lose all their wealth and go out of business”; “vii) There may be spillovers if optimists in one asset hit by bad news are led to sell other assets for which they are also optimists”; “viii) Investors who survive have a great opportunity.” See also Geanakoplos (2010). The logic behind this depicting is more or less similar to the logic in the description of Brunnermeier (2009), who uses the concepts of “loss spiral” and subsequent “margin spiral” in order to explain different levels of self-reinforcing feedback mechanisms.

Thus, Geanakoplos (2010) argues that the rise and fall of asset prices after 1999 were mainly driven by leverage and this period represents a leverage cycle. In order to support this hypothesis, he provides two graphics that show correlations between leverage and housing prices, and between leverage and securities prices (see Figure.2.22). In the first picture, it is shown that down-payments offered for a significant part of subprime borrowers has fallen below 5 percent in the run-up to the crisis and this trend was accompanied by housing prices. Geanakoplos (2010) draws attention to the peaks of both of the variables and the precedence and sharpness of declining leverage (rising margins). In the second picture, the correlation between an index of prime mortgage securities prices and margins offered to a hedge fund is shown. As in the case of housing prices, sharp decline in leverage in 2007 led up to sharp decline in securities prices.

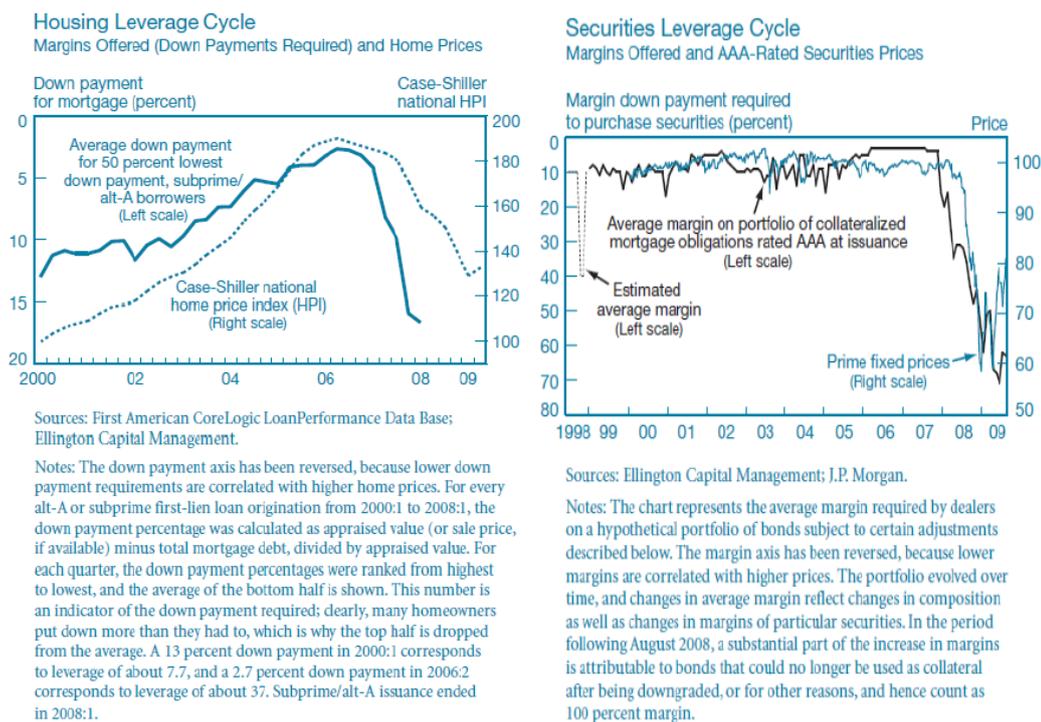


Figure 2.22 Leverage, Housing Prices and Securities Prices

Source: Geanakoplos (2010:108-109).

Although these evidences provided by Geanakoplos are limited<sup>66</sup>, the fundamental point he indicates is worth-pondering. The contribution of Geanakoplos (2009) is the internalization of leverage as a direct determinant of housing prices, and, in general, of the asset prices for those that can be used as collateral. He (2010: 110) explicitly states that “housing prices soared because of the expansion of leverage” and especially within the subprime sector of households. Thus, this view implies that since the leverage has a limit at where down-payments reach zero, housing price appreciation is also restricted by this boundary. Accordingly, Geanakoplos (2010) explains the low-end of the latest “leverage cycle” with high and unsustainable level of leverage in subprime loans and accompanying rise in delinquency rate. At this point, the evidences provided by Demyanyk and van Hemert (2008) support these views (by the way, Geanakoplos (2010) also look closely to delinquencies of loans according to their vintage year, as was in Demyanyk and van Hemert). A natural corollary of this view is that the inner mechanisms of mortgage credit boom puts limits on the development of itself, and as we argued in the previous parts of this chapter and as aptly put by Geanakoplos (2010: 10), “[t]he rapidly expanding supply of new housing demand, fueled by access to easy mortgages, began to slow for completely rational reasons, not because of a sudden pricking of irrational exuberance.” Thus, if it is accepted that housing prices soared because of the mortgage credit boom characterized by lowering lending standards and increasing household leverage, then it is reasonable to argue that the decline of housing prices is inevitable, not because of sudden changes in the psychological conditions of market participants but mainly because of the inner boundaries of the credit boom and accompanying leverage<sup>67</sup>.

---

<sup>66</sup> We will not cover the full story of Geanakoplos (2010) and his descriptive data on the development of the crisis. However, as one notices that his main arguments about “the anatomy of a crash” (see the previous footnote) can be fitted well to the events of 2007 and 2008, and also it fits well to the descriptions we made in the first section of this chapter.

<sup>67</sup> We should note that Geanakoplos (2010) proffers different causes for the slowdown of housing prices in 2006 and their sharp decline after 2007. He (2010:111) states that “[t]hrough the peak of the housing market preceded the peak of the securities market, the collapse in securities prices preceded the significant fall in housing prices. Thus, in my view the trigger for the downturn in bonds was the bad news about delinquencies and the concurrent creation of the standardized CDS market in subprime mortgage indexes, which then spilled over into the housing market.”

Moreover, beyond this fundamental form of “leverage cycle theory” that starts with good news and ends up with bad news, Fostel and Geanakoplos (2011) develops another theory of leverage cycle in which two important financial innovations, securitization and credit derivatives, are embedded. In general, Geanakoplos (2010) argues that both of these innovations raised leverage in different ways, and by the way, according to him, this explains, in part, why the recent “leverage cycle” was the worst since the Great Depression. The theoretical model of Fostel and Geanakoplos (2011) mainly confirms this point.

According to Geanakoplos (2010), the fundamental point about securitization and related innovations is that they allow for increasing the extensity and magnitude of leverage because, at first, it enables to use of new kinds of assets as collateral, such as AAA-rated MBSs. Also, it increases the amount of assets that can be used as collateral, such as those houses settled by low and middle income groups, because the development of securitization contributed to rise of subprime mortgage market. Besides these examples that explain the contribution of securitization to the extensity of leveraged borrowing; pooling and securitization themselves increase the magnitude of leverage, according to Geanakoplos (2010). At first, securitization itself and following re-securitization brings about more effective use of collateral by allowing the use of same collateral to back several loans. Moreover, according to Fostel and Geanakoplos (2011) the introduction of tranching raises the leverage and the price of underlying asset further, because it allows for matching the heterogeneous needs of investors who buy those assets, so allows for involving the riskiest segments of mortgage loans into structured products.<sup>68</sup> Also, as it is put by Geanakoplos (2010: 113), “[t]he whole securitized structure can be interpreted as if the buyer of the junior piece actually bought the whole pool, using a long-term loan from the buyer of the senior piece, collateralized by the whole pool”, since the senior-tranche-holder is rewarded by the priority of appropriation of incoming cash

---

<sup>68</sup> “Tranching makes the underlying collateral more valuable because it can be broken into pieces that are tailor made for different parts of the population, just as the traders in the 1990s realized. Splitting plain vanilla into strawberry for one group and chocolate for another should raise the value of the scarce ice cream. Leverage is an imperfect form of tranching and one would guess that therefore leverage would not raise the asset price as much as tranching” (Fostel and Geanakoplos, 2011: 6).

flows and the junior-tranche holder takes the risk of investment and obtains only the remaining cash flows. As we know, increasingly larger parts of securitization pools are transformed into senior AAA-grade tranches and the remaining small and the riskiest slices of pools were held by the securitization vehicles themselves. Thus, it follows that if, in fact, “the juniors [were] as effectively borrowing from the seniors”, then “it becomes clear how the rapid spread of securitization over the last thirty years, but especially over the last ten years, dramatically increased the leverage in the system” (Geanakoplos, 2010:113).

According to Geanakoplos (2010), the main point about CDSs is that when they entered into mortgage-related securities markets in late 2005, they allowed pessimists for expressing their views and increasing their leverage on these views for the first time, i.e. they could bet on declining housing prices. Therefore, when CDSs are introduced, asset price will tend to fall, according to Geanakoplos. The basic intuition behind this argument is that since the sellers of CDS put the cash as collateral, “they are effectively tranching cash! That raises the value of cash relative to the reference asset.” (Fostel and Geanakoplos, 2011:7). Moreover, Geanakoplos (2010) argues that CDSs allow pessimists to affect prices more than the effect of optimists, because when there is a perception about sharp decline in asset price, CDS buyer (pessimist) will ask to be put up much more collateral (cash) by the issuer. Therefore, leveraging their position, CDS buyers, pessimists, may create declining trend in asset prices instead of lend money to optimists. Moreover, during the period that CDS do not lower the asset price, already-leveraged optimists will be leveraged more to the extent that they become the issuer of the CDSs (Geanakoplos, 2010).

Thus, relying on these observations about financial innovations, Fostel and Geanakoplos (2011), building a two-period static model with heterogeneous agents (“marginal buyer theory”), investigate the equilibrium price of collateral assets (referring to housing or assets that used as collateral in wholesale funding markets) in different cases. These cases include no-leverage-economy, in which purchased asset cannot be used as collateral; leverage-economy in which the use of collateralized lending is introduced; tranching-economy, in which securitization and

tranching are introduced and CDS-economy, in which CDSs are introduced. By this model, they show that, under certain conditions, the highest equilibrium asset prices occurs in tranching-economy, then, respectively, leverage-economy prices, no-leverage-economy prices and finally CDS-economy prices are aligned in descending order. Finally, building a dynamic model by which the initial condition, no-leverage economy, is followed by the sudden (unexpected) introduction of leverage, then securitization and tranching, and finally CDSs, they show that underlying asset prices rise until the CDSs are introduced and they collapse with this introduction. They argue that this model fits well to the historical order of innovations and explain well the size of the crisis according to base model, in which only good news and bad news precipitates the processes<sup>69</sup>.

### **2.3.3. The role of regulations in high system-wide leverage and the effect of them on self-reinforcing feedback mechanisms**

There are some observations and cases for the role of regulations and regulatory agencies in rising system-wide leverage. At first, the Fed did not react in any way to rising leverage and it also encouraged deregulations that enhanced the use of securitization and CDSs (Geanakoplos, 2010). Moreover, implicit government guarantees provided for so-called “too-big-to-fail” firms and for GSEs was one of the sources of their high-level of leverage (Geanakoplos, 2010; Levine, 2010). In addition, the overlapping of the deregulation of minimum capital requirements for investment banks in 2004 and the starting of uptrend of leverage for investment banks in 2004 was important (Levine, 2010). While Securities and Exchange Commission (SEC) restricted investment bank leverage to 12 times capital before 2003, with the pressure of investment banks, it raised the upper limit 40 times capital by making compliance voluntary in 2004 (Crotty, 2009)<sup>70</sup>. Finally, with a cross-

---

<sup>69</sup> “In our view the key to the size of the crisis is the order of the financial innovation that materialized. Securitization, with all the tranching of CDOs and leverage created a bubble and the introduction of CDS burst it, pushing pricing faster and further down than they would have gone had there never been tranching or leverage or CDS. Had CDS been there from the beginning, asset prices would never have gotten so high” (Fostel and Geanakoplos, 2011: 37).

<sup>70</sup> See also Levine (2010) for similar arguments.

country econometric analysis, Kalemli-Ozcan et. al. (2012) finds that banks of those countries with stricter regulation and supervision on banking industry deleveraged less during the recent crisis<sup>71</sup>.

Besides such observations, it can be argued that financial liberalization of the last three decades and accompanying rise in financial innovations might have been increased the power of self-reinforcing feedback mechanisms (Borio, 2012; Cömert, 2013)<sup>72</sup>. Cömert (2013) provides a theoretical framework to understand the effect of regulations and innovations on self-reinforcing mechanisms. He (2013) argues that “financial markets have always had an endogenous mechanism of balance sheet expansion”, but “the influence of this mechanism may be stronger if it is no longer limited by balance sheet constraints”. This implies that with the combination of existing endogenous balance-sheet expansion channels (some of which mentioned above), “decreasing balance-sheet constraints may explain the explosive growth of US financial markets since the 1980s” (Cömert 2013). With a simple theoretical model, Cömert (2013) shows that a lower fraction of financial institutions that face binding capital requirements brings about a higher total expansion of balance sheets in the financial system. Then, adding those self-reinforcing dynamics of balance-sheet expansion, he shows that these developments can create explosive growth of balance-sheet. As a result, although these arguments need to be elaborated on, it seems that changes in the institutional structure of the US financial system since the

---

<sup>71</sup> However, we should note that their econometric analysis shows only little relationship between leverage and restrictiveness of regulation for the boom period, 2001-2007 in their cross-country sample (their monitoring index seems generally significant for nearly whole period, while supervision index shows much less significance).

<sup>72</sup> Borio (2012:6, emphasis in original) states that “[t]he length and amplitude of the financial cycle are no constants of nature, of course; they *depend on the policy regimes in place*. Three factors seem to be especially important: the financial regime, the monetary regime and the real-economy regime... Financial liberalisation weakens financing constraints, supporting the full self-reinforcing interplay between perceptions of value and risk, risk attitudes and funding conditions. A monetary policy regime narrowly focused on controlling near-term inflation removes the need to tighten policy when financial booms take hold against the backdrop of low and stable inflation. And major positive supply side developments, such as those associated with the globalisation of the real side of the economy, provide plenty of fuel for financial booms: they raise growth potential and hence the scope for credit and asset price booms while at the same time putting downward pressure on inflation, thereby constraining the room for monetary policy tightening.”

1980s and flourishing of financial innovations might have increased the degree of self-reinforcing capacity of the financial system (Cömert, 2013).

As a result, it can be concluded that some regulatory inefficiencies were very likely contributed to high system-wide leverage. Besides, financial liberalization and accompanying increase in financial innovations during the last three decades might have increased the effectiveness of self-reinforcing feedback mechanisms.

#### **2.4. The role of some incentive structures in the build-up of financial vulnerabilities**

Arguably, much of the perverse incentives are related with or arisen from the regulatory and legal arrangements and the emergence of financial innovations. In the second section, we mentioned about how securitization created perverse incentives for exploiting regulatory arbitrage and for relying on fee income to generate profits, thence avoiding of costly screening activities. In this section, we analyze how the “shortsightedness”, reckless excessive risk-taking, and mutual dependency between financial institutions have contributed to the crisis and how these perverse incentives were unleashed. Firstly, we will present the arguments about the perverse incentives that are embedded in the management remuneration structure of financial institutions. Then, the relationships among financial agents and the problems arisen from this area will be analyzed, especially focusing on the cases for credit rating agencies and perverse incentives arisen from the recurrent bailouts in the past and accompanying “too-big-to-fail” concept.

##### **2.4.1. Remuneration systems and other incentive structures related with excessive risk-taking**

Shortsighted profit-seeking behaviour of top executives and their recklessness about excessive risks they accumulated before the crisis are counted by many among the causes of the recent global crisis. Alongside some other factors, remuneration systems of large financial institutions might have contributed to this problem (Crotty, 2009; Diamond and Rajan, 2009). It is generally accepted that many of those largest

financial institutions use performance-based or outcome-based remuneration systems. In an investigation over compensation practices in the US banking system by Andrew Cuomo (2009:1), the New York State Attorney General, it is stated that “most banks emphasize the importance of tying pay to performance.” Cuomo (2009:1) cites from one senior bank executive, who states that “employees should share in the upside when overall performance is strong and they should all share in the downside when overall performance is weak.” Current widespread practices in remuneration methods of top executives are based on the “agency theory” framework (Berrone, 2008). According to this framework, incentives should be designed so that shareholders (principals) should mitigate the problems arisen from asymmetric information between principals and agents (managers). Therefore, those remuneration methods that are supposed to align the interests of managers with shareholders are applauded.

However, this remuneration structure could be blamed for its contradictions and for creating excessive risk-taking and shortsighted behaviour, thence contributing to the factors that culminate in the crisis. For example, according to Berrone (2008), stock options, one of the most widespread practices within the remuneration contracts of top executives and justified by agency theory, rewards executives when the stock prices rise, but do not punish them when the prices decline. Thus, this structure gives an incentive for excessive risk-taking and shortsighted behaviour when the financial markets flourish, because those executives need improvements in stock prices only for a short time in order to execute their options (Berrone, 2008). Indeed, the investigation of Cuomo (2009) confirms this argument strikingly. What the data provided by Cuomo (2009) says is that, as sarcastically put by him, “when the banks did well, their employees were paid well. When the banks did poorly, their employees were paid well. And when the banks did very poorly, they were bailed out by taxpayers and their employees were still paid well.”

There are some evidences that support the foregoing arguments. As shown by Crotty (2011) and Cuomo (2009), during the crisis years, 2007-2008, compensations, benefits and bonuses of top executives were not accompanied with declining

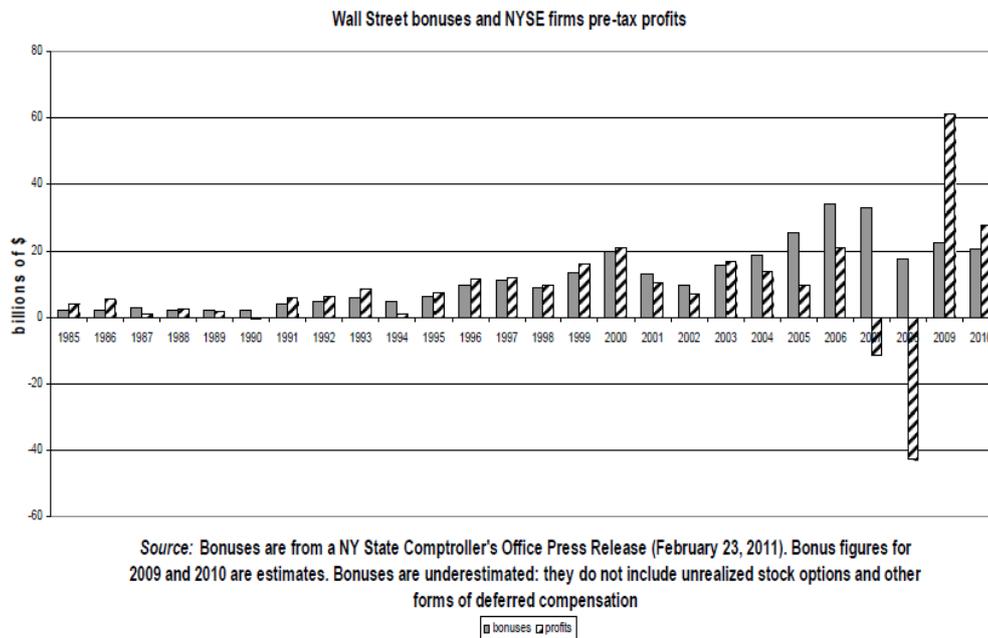
revenues and profits of their banks. Cuomo (2009), providing the data about bonuses and earnings of nine large banks that were supplied \$175 billion, in total, by TARP (Troubled Asset Relief Program) in 2008, shows that two financial firms (Citigroup and Merrill Lynch) paid out nearly \$9 billion in bonuses aggregately, when they suffered losses of \$54 billion in total (\$27 billion at each firm) and granted with \$55 billion by TARP. To make these figures sharper, take Merrill Lynch, which was merged with Bank of America at September 2008, as an example. Merrill Lynch suffered from \$27.6 billion net losses in 2008, but paid out \$3.6 billion in bonuses at the same time. While 696 employees earned at least \$1 million as bonuses, the top 149 bonus recipients benefited from \$858 million bonuses (Cuomo, 2009). Also, other three large firms (Goldman Sachs, Morgan Stanley and JPMorgan Chase) paid out bonuses that amounted to the levels exceeding their net income, when they were benefited from TARP funds with amounts that exceeded the bonuses dispensed in each financial firm (Cuomo, 2009). Since the other banks do not fit the schemes above and they behaved “normal” according to the suggestions of performance-based compensation framework, it can be concluded “the relationship between performance of the firms and bonuses varied immensely and the bonus incentive system does not appear to have been tethered to any consistent principles tying compensation to performance or risk metrics” (Cuomo, 2009:2). What is more, the data about compensation and benefits these firms paid out between 2003 and 2009 shows that, in general, while compensation and benefits steadily increased between 2003 and 2006, as expected, they did not fall when the crisis hit these banks and their performances plummeted (Cuomo, 2009)<sup>73</sup>.

Another striking evidence from Crotty (2011) shows that while Wall Street firms (large investment banks and security broker-dealers) have generated ever-

---

<sup>73</sup> For examples, Cuomo (2009:2) states that “at Bank of America, compensation and benefit payments increased from more than \$10 billion to more than \$18 billion in between 2003 and 2006. Yet, in 2008, when Bank of America's net income fell from \$14 billion to \$4 billion, Bank of America's compensation payments remained at the \$18 billion level. Bank of America paid \$18 billion in compensation and benefit payments again in 2008, even though 2008 performance was dismal when compared to the 2003-2006 bull market. Similar patterns are clear at Citigroup, where bull-market compensation payments increased from \$20 billion to \$30 billion. When the recession hit in 2007, Citigroup's compensation payouts remained at bull-market levels –well over \$30 billion, even though the firm faced a significant financial crisis.”

increasing profits from the mid-1980s towards 2000 (except the years of crisis), profits of these firms did not show up an explicit pattern during the 2000s (see Figure.2.23 below). Moreover, the 2000s witnessed a changing relationship between bonuses and profits of these firms. Bonuses started to exceed profits in Wall Street firms permanently during the 2000s and in the run-up to the crisis the difference between bonuses and profits grows sharply. As a result, as opposed to arguments about performance-based management remuneration systems, all these show that the ever-growing huge compensation schemes and bonus pools of large financial firms were not connected to the bank performance in the 2000s, and especially during the crisis.



Note: Profits are from Securities Industry and Financial Markets Association for 1985-2007, and from NY State Comptroller's Office for 2008-2010.

Figure 2.23 Bonuses and Pre-tax Profits of Wall-Street firms over time

Source: Crotty (2011).

How this remuneration system might have contributed to the factors? Despite the apparent riskiness of those underlying loans because of ever-growing household

leverage, MBSs and CDOs were heavily invested in because it was the “part of a culture of excessive risk taking that had overtaken banks” (Diamond and Rajan, 2009:4-5). Although there is an apparent disconnectedness between bank performance and top executive payments during the 2000s, the performance and remuneration of a CEO is, nonetheless, based partly on the revenues his/her firm generated relative to the others’. Thus, even if some banks could generate legitimately high returns, this would generate pressure on the other bank CEOs to catch-up (Diamond and Rajan, 2009). Moreover, even if a CEO realized that increased leverage in the firm exposed to excessive risk, the incentive structure would induce him to take on high leverage in order to maximize share value in order to materialize stock option (Diamond and Rajan, 2009, Stiglitz, 2009). Besides, investors may punish those executives that try to be responsible about risk-taking in an ebullient period (Stiglitz, 2009). Thus, all these inevitably would result in excessive risk-taking by these firms.

Secondly, since compensation schemes are mainly adjusted for performance in the short-term, they brought about excessive risk-taking and controlling or fixing this strategy may not be an easy task because of the pressures for short-term profitability in the financial markets (Diamond and Rajan, 2009). The adjustment of compensation schemes to short-term profits rewards only the expansion of total assets and total revenues in the end, without taking into consideration the risks that such an expansion bring about (Calomiris, 2009). This implies that the revenues and profits generated by excessive risk-taking are mostly attributed to “superior abilities” of those top executives and traders. Therefore, even the risk premium or “tail risk” was internalized as a part of income and bonuses (Diamond and Rajan, 2009). Finally, since tail risks rarely materialize and are hard to quantify, such type of trading and internalizing of risk premiums as income are hard to control (Diamond and Rajan, 2009). Considering also the pressure for short-term profits from top executives, incentives become also weak for fixing or controlling such actions (Diamond and Rajan, 2009). On the other hand, even in the case of the materialization of tail risks, in the recent case when it was revealed that mortgage-related financial products were in downfall, financial institutions kept up engaging in

excessive risk-taking in order to boost their executive payments and bonuses (Crotty, 2011)<sup>74</sup>. This further confirms the prevalence of a culture of excessive risk-taking in the financial system. As a result, the compensation schemes of the financial firms that based on short-term profitability created incentives for excessive risk-taking that engendered significant vulnerabilities during the boom period and even during the crisis.

However, while it is obvious that “short-termism” in the financial institutions generate huge payments and bonuses for those top executives and traders, it may engender substantial amount of losses for the firm in the long-run. For example, this was the case for Merrill Lynch, which lost all the gains of the boom period during the crisis (Cuomo, 2009), alongside the famous cases of Lehman Brothers and Bear Sterns. Then, as Crotty (2011) put it, the question of how the shareholders of these firms allow for following those risky strategies arises. According to Crotty (2011), “financial market theory” (referring to agency theory) does not explain the permanence of those compensation schemes, which, in the end, may cause the extinction of the firm. He (2011:16, emphasis in original) states that although “the data clearly show that existing compensation schemes induce behavior that is inconsistent with objective shareholder interests, *Keynesian theory suggests that in financial booms, shareholders are likely to believe that rainmaker [referring to top managers and traders] compensation policies are compatible with their perceived or subjective interests.*” This alignment of interests of shareholders and top executives on the excessive risk-taking strategy can be explained by the optimistic expectations of the shareholders during the boom period (Crotty, 2009).

---

<sup>74</sup> As an example, Crotty (2011:3-4) gives an anecdotal evidence: “when CDOs began to lose value in 2007, giant investment banks such as Merrill Lynch and Goldman Sachs began lending money to supposedly ‘independent’ CDO managers (who in fact were strongly influenced by the big banks) ‘so they could buy the banks’ dodgy assets. ...Faced with increasing difficulty in selling the mortgage-backed securities that had been among their most lucrative products, the banks hit on a solution that preserved their quarterly earnings and huge bonuses: They created fake demand.’ However, to induce the CDO managers to take their “dodgy assets” the banks had to lend them the money used in the purchase. ‘If the managers couldn’t pay the loans back - and most were thinly capitalized - the banks were on the hook for even more losses when the CDO business collapsed.’ But bank rainmakers did not have to give back the bonuses associated with these deals, so it was in their interest to do them.”

Nonetheless, the most important part of the answer may lie in the fact that the centralization of the shares of financial institutions among the financial institutions themselves has advanced considerably throughout the time, as Crotty (2011) put it. Crotty (2011:16) shows that while the household sector owned 90 percent of stock during the 1950s; “[b]y 2007, financial institutions held two-thirds of US stock. The *Wall Street Journal* reports that ‘18 of the top 20 shareholders at Morgan Stanley and Bank of America and 19 of the top 20 at Goldman Sachs are mutual funds’”. However, the centralization of stock ownership of financial institutions among financial institutions themselves does not mean that institutional investors could control or affect the decisions of those financial firms. Calomiris (2009:70) points out that “[p]ensions, mutual funds, insurance companies, and banks are restricted from holding anything but tiny stakes in any particular company, which makes these informed professional investors virtually impotent in promoting any change within badly managed firms.” Besides, considering the dependence of the managers of those shareholder-financial-institutions (or institutional investors) about high-gains in short-term periods as in the case of other financial firms, the excessive risk-taking strategy of financial firms are easily embraced by them and this partly explains the alignment of shareholders and top executives during the boom period (Crotty, 2011). Furthermore, since the managers of institutional investors are also under the pressure of competition for above-average returns and holding market share, this will feed investment in those shares that issued by excessively risk-taking financial firms for the sake of short-term gains, even in the case the recognition of possible future losses (Crotty, 2011). As aptly put by Crotty (2011: 18), since “no individual firm will lose contracts as long as their losses are not substantially worse than the industry average”, the best choice for an institutional investor will be the following-up of the herd. Relying on all these matters, as opposed to the suggestions of agency theory, it can be concluded that “shareholders will not restrain the excesses of rainmaker [top managers and traders] compensation schemes” because of the incentives and pressures created by the market that align their interests with top managers of the financial firms during boom periods (Crotty, 2011:18).

As a result, these evidences clearly show that huge compensation and bonus pools create perverse incentives for top executives to take excessive risks during the boom periods and even during the crisis. Although it is supposed that large financial firms adjust their remuneration structure according to firm performance, evidence shows that this was not the case during the crisis and those top executives were still rewarded with huge bonuses. Moreover, it is shown that competition among large financial firms contributes to shortsightedness and excessive risk-taking, and also it reduces incentives to fix and control such behaviors. Finally, despite the possibility of huge losses or bankruptcy, since it seems that shareholders' interests were mostly aligned with the interests of top executives because of increasing centralization within the financial sector and optimistic expectations about the permanence of huge profits during the boom, this contributes both to the exacerbation of shortsightedness and to the permanence of hazardous remuneration structure.

#### **2.4.2. Incentive problems of credit rating agencies**

The reliance of financial firms and regulators on credit rating agencies while assessing the degree of risks related with financial instruments produced dangerous incentives for financial agents and dangerous interactions within the financial system which culminated in underpricing of risks (Levine, 2010; Stiglitz, 2009; Mishkin and Eakins, 2012). However, the reliance on rating agencies in the financial system was mostly a product of past regulations (Levine, 2010).

As we have discussed in the previous section, highly rated securities had some advantages. For example, they allowed banks for expanding their balance sheets by holding less regulatory capital against those mortgage-backed securities. Also, highly-rated securities can be used as collateral in short-term borrowing markets, so they bring about easier access to these markets. Since rating agencies determined the riskiness of these assets and capital adequacy requirements entailed a small amount of capital to support highly rated securities, there was a strong demand for high ratings from the finance industry (Crotty, 2009). Also, since the regulations entailed those important financial institutions (e.g. pension funds) could not hold securities

with less than AAA investment grade, this added to high demand for higher ratings (Levine, 2010, Crotty, 2009; Brunnermeier, 2009). As a result, in order to make profits, rating agencies should have kept these demanders happy<sup>75</sup>.

What is more, since rating agencies sells their ratings to security issuers, this engenders flawed incentives to both issuers and raters. A kind of mutual dependency arises from that security issuers are willing to pay much more for overrating because, in doing so, they increase demand for those securities, and in turn, the rating agencies are willing to maintain their repeat business with those issuers by providing higher ratings (Levine, 2010; Stiglitz, 2009). Secondly, according to Levine (2010), after the late 1990s, when securitization and structured financial products flourished, flawed incentives increased further due to selling of ancillary consulting services to those processing structured securities. In doing so, the rating agencies sell the service of how the banks should package securities to obtain higher ratings and then sell the ratings on the same products (Levine, 2010:9; Stiglitz, 2009; Mishkin and Eakins, 2012). As a result, since the rating agencies have not sufficient incentive to make accurate ratings, this resulted in the inflated ratings and underpricing of risks. All in all, we think that there was a problem of incentive in making credit ratings, which arisen from both the investors' demand for higher-grade securities in order to exploit regulatory arbitrage and the sellers' desire for higher-grades because of simply increasing profits.

On the other hand, Levine (2010) draws attention to excessive privileges of credit rating agencies bestowed by regulations and argues that these excessive privileges might have caused their risk underestimation. These privileges included poor accountability, almost no responsibility for their bestowed ratings and protection from competition. There was a key role for one designation of the SEC prepared in 1975, which granted significant privileges to especially the largest rating

---

<sup>75</sup> Crotty (2009: 566) states that “[i]f one agency gave realistic assessments of the high risk associated with these securities while others did not, that firm would see its profit plummet.” Moreover, he (2009) states that in 2005, more than 40 percent of the revenue of Moody’s came from mortgage-related products. Levine (2010: 11) states that “the operating margin at Moody’s between 2000 and 2007 averaged 53 percent. This compares to operating margins of 36 and 30 percent at Microsoft and Google, or 17 percent at Exxon.”

agencies and prepared the ground for the extensive reliance upon the assessment of rating agencies by the financial institutions (Levine, 2010). By this designation, other regulatory agencies and various types of financial institutions were implicitly forced to follow the risk assessments of rating agencies while they have set capital requirements and asset allocation guidelines (Levine, 2010). These privileges, given by previous financial regulations, may explain to a great extent why the financial institutions relied so much on rating agencies about the risk assessment. Moreover, regulations grant rating agencies with significant power in determining the demand over certain securities (Levine, 2010). Since “regulators, official agencies, and private institutions around the world relied on NRSRO [Nationally Recognized Statistical Rating Organization] ratings, virtually every issuer of securities was compelled to purchase an NRSRO rating if it wanted a large market for its securities” (Levine, 2010: 7). Therefore, this process that started with the regulatory authorities’ reliance on rating agencies created an environment in which rating agencies shaped the demand for securities and investment opportunities. Finally, even though rating agencies may care about the loss of reputational capital due to false assessments, according to Levine (2010:8), “regulations weakened the degree to which a decline in the reputation of a credit rating agency reduced demand for its services”. These regulations include that, first, rating agencies have no legal responsibility for the quality of their ratings; second, capital regulations on the majority of security buyers indicates the use of ratings regardless of the performance of rating agencies, thus, these grants moderated the performance requirements for rating agencies (Levine: 2010: 8-9). In sum, with bestowed privileges to those largest credit rating agencies, they might have been confident in giving high-grades to many undeserved securities because of making huge profits from the securities investors’ and sellers’ growing demand for high ratings.

#### **2.4.3. Perverse incentives arisen from recurrent bailouts**

The bailout of the so-called “too-big-to-fail” (TBTF) firms can be blamed for several reasons. Firstly, this creates moral hazard and excessive risk-taking because TBTF firms can borrow less costly since the creditors of TBTF firms believe that

these firms have an implicit bailout guarantee (Bernanke, 2010b). In turn, this belief reduces risk premiums, so interest rates charged on these firms. In addition, both creditors and TBTF firms tend to allocate less resource for monitoring the risks held by TBTF firms and this creates moral hazard and excessive risk-taking (Bernanke, 2010b). Secondly, as an implication of the first, TBTF firms create uneven playing ground with unfair competition between small and big firms (Bernanke, 2010b). Also, TBTF firms have “competitive market and cost-of-capital advantages, but not efficiency advantages, over firms not thought to be systemically important”. (Greenspan, 2010b:11). Thirdly, TBTF firms bring major risks to overall economic stability when they were on the brink of or went into bankruptcy (Bernanke, 2010b).

Although concerns over the bailout of the TBTF firms are expressed by policymakers and regulators, as we have seen above, it can be argued that, in effect, regulators allowed (or did not object) financial institutions to take excessive risk. Also, they facilitated excessive risk-taking by showing examples of many bailouts and contributing to the belief on that issue among market participants in the last three decades (e.g. Crotty, 2009; Krugman, 2009). In this respect, Crotty (2009:570) states that the regulators “allowed the dominant financial firms and their top bonus recipients to engage in publicly subsidized win–win gambles”. Besides, as aptly put by Crotty (2009), repeated bailouts during the crises of the previous decades have been created ever larger financial markets and more threatening financial crises. According to calculations of Crotty (2011:7), a shareholder that “bought stock in the five investment banks after 1994 ... would have lost wealth”, for example, “[b]uying in 1998 would result in a 67% loss of investment value” without any government bailouts and rescue efforts of the last two decades. Finally, despite the concerns over bailouts of large firms, regulators and policymakers came into play again in order to rescue large financial firms with huge amounts of packages during the recent crisis. According to Crotty (2011), the US government provided \$12 trillion for rescue efforts during and after the crisis and significantly contributed to recovery of profits in 2009. In conclusion, bailouts of the last decades contributed to both the belief over “too-big-to-fail” firms and the expansion of “too-big” firms and financial markets,

all of which, in turn, created new, larger and more dangerous waves of bubbles and busts (Crotty, 2009).

## **2.5. The Role of Deregulation, Inefficient Supervision and Government failures in the crisis**

Until now, we have already discussed how regulations and regulatory agencies might have been contributed to financial vulnerabilities in different contexts. We stressed on how capital adequacy requirements of Basel accords became the source of incentives to create off-balance-sheet vehicles. Also, we mentioned shortly how inefficient regulations and supervision contributed to leverage and enhanced self-reinforcing feedback mechanisms. Finally, we focused on how they have contributed to excessive risk-taking by creating perverse incentives. In this section, we will discuss a little bit more about the role of regulatory and supervisory failures with the help of the literature. Moreover, we will focus on a distinct approach, which points out exclusively failures in government housing policies. Accordingly, there will be two parts in this section. First, we will discuss the cases for inefficient regulations and supervision. Secondly, we will focus on the argument on government housing policy failure.

### **2.5.1. Cases for Deregulation, Lack of Regulation, Regulatory conflicts and inefficient supervision**

Firstly, the Fed and other regulatory agencies were accused for fraudulent lending practices in the mortgage sector. For example, Mishkin and Eakins (2012) states that fraudulent practices in mortgage originations compounded by “lax regulation of originators, who were not required to disclosure information to borrowers” on the affordability of loans. However, on the role of the Fed, Bernanke (2010b) states that easing of standards in the subprime mortgage origination and other abusive lending practices resulted in the deficiencies in protection of consumers, but the Fed had limited authority despite the fact that it had addressed some of the problems. Greenspan also (2010b) argues that the Fed have actively

done its duty in detecting and declaring abusive, unfair, deceptive and discriminatory practices inside the mortgage markets, but its authority, especially its enforcement capability was limited. As a supportive fact, it is also argued that most of the mortgages were originated by independent mortgage companies that are not subject to regulation by the Fed or federal banking regulators, but to consumer protection enforcement by other agencies (Greenspan, 2010b: 12-3). The data we get from Demyanyk and Loutskina (2012), shown in Table 2.1 below, seems as approving the foregoing argument, despite the fact that a significant part of mortgage originations still fell on those banks under regulatory and supervisory restrictions. According to this data which covers a significant part of loans originated (87 percent), while mortgage companies originated 59.4 percent of all mortgage loans, banks originated 40.6 percent of loans from 1999 to 2006. In any case, what this discussion simply shows is that there was not any integrated structure in the US in order to monitor the practices of different kind of mortgage originators and intervene in the market when appropriate before the crisis.

Table.2.1 Mortgages Originated by Banks and Mortgage Companies

Table 1: Mortgage Lender: Summary Statistics.

This table reports summary statistics for four types of mortgage lenders. The first column summarizes the data for depository institutions (labeled as banks) which do not have any mortgage subsidiaries affiliated with them. The second column shows the statistics for the for depository institutions that have mortgage companies affiliated with them (banks with MC). The third column provides statistics for mortgage companies that are subsidiaries of BHCs (MC affiliated). The fourth column summarizes the data for independent mortgage companies. The data cover loans originated between 1999 and 2010 as reported in HMDA data. Year 2007 is omitted for quality of the inferences.

	Banks Without MC	Banks With MC	MC Affiliated	MC Independent
<b>Panel A: Loans originated from 1999 to 2006</b>				
Number of Loans (millions)	31.4	12.3	24.0	30.6
Loan Volume (\$ billions)	5,141	1,901	4,170	5,142
Average Loan (\$1,000)	163.6	154.7	173.7	168.2
Average Borrower Income (\$1,000)	97.0	99.4	94.4	89.6
High-yield (Subprime) Loans (% post 2004)	13.1	15.6	19.1	39.6
Securitized through GSEs (%)	28.1	21.8	53.2	18.5
Privately Securitized (%)	16.9	9.8	20.0	58.2
Refinancing (%)	35.6	28.4	29.5	20.8
Jumbo Loans (%)	4.7	4.0	4.2	2.8
Average Loan to Income Ratio	2.0	1.8	2.2	2.3
Borrower Income to Area Income	1.9	1.9	1.8	1.7
<b>Panel B: Loans originated from 2008 to 2010</b>				
Number of Loans (millions)	10.6	7.2	2.7	5.5
Loan Volume (\$ billions)	2,121	1,677	645	1,232
Average Loan (\$1,000)	200.1	232.7	236.5	223.0
Average Borrower Income (\$1,000)	116.0	125.6	120.0	108.3
High-yield (Subprime) Loans (%)	10.2	6.6	13.2	13.6
Securitized through GSEs (%)	29.1	53.3	53.2	23.9
Privately Securitized (%)	17.5	4.0	18.7	58.5
Refinancing (%)	36.8	28.7	21.1	23.1
Jumbo Loans (%)	3.3	2.9	2.2	2.2
Average Loan to Income Ratio	2.1	2.3	2.4	2.6
Borrower Income to Area Income	1.83	1.90	1.88	1.65

Source: Demyanyk and Loutskina (2012)

The empirical study of Demyanyk and Loutskina (2012) approves our interpretation. They mainly show that inconsistent regulatory oversight across depository institutions (banks) and mortgage companies (MC) contributed to deterioration of the underwriting standards in mortgage origination and created incentives for Bank-Holding Companies (BHCs) to appropriate this regulatory arbitrage and engaging in riskier lending activities through their MC subsidiaries (Demyanyk and Loutskina, 2012). The regulatory arrangements require banks (depository institutions) to comply with deposit insurance requirements, capital requirements and consumer compliance requirements (Demyanyk and Loutskina,

2012). On the other hand, MCs were not under such regulatory oversight applied for depository institutions. According to the findings of Demyanyk and Loutskina (2012), the main motivation for a BHC to establish a MC subsidiary is the exploitation of this regulatory arbitrage and sidesteps the regulatory capital requirements because MCs have no capital requirements. Besides, they were not under the regulatory restriction that requires provisions for non-performing loans and loan losses in the depository institutions (Demyanyk and Loutskina, 2012). Also, BHC parent of an MC does not have to provide provisions for expected losses coming from its subsidiary (Demyanyk and Loutskina, 2012). Moreover, while “[m]ost MCs had an option to implode without passing all their losses on to a parent ... supervisors were determined to prevent any *depository* subsidiary from implosion without holding its parent BHC fully responsible for applicable losses” (Demyanyk and Loutskina, 2012:8). Demyanyk and Loutskina (2012) find that higher originate-to-distribute activity through MC subsidiaries accompanied with lower BHC-level on-balance-sheet losses after the crisis, while it accompanied with higher losses on BHC balance-sheets when bank subsidiaries were used in originate-to-distribute activity. Moreover, they (2012:24) find that MC subsidiaries of BHCs, as compared to bank subsidiaries of same BHCs, displayed much more relaxation in lending standards, by “originating more loans to borrowers with lower credit scores, higher loan-to-income ratios, and lower relative incomes”. This means that by establishing MC subsidiaries, BHCs became able to both originate riskier loans by holding less, if any, capital against them and shield from the losses of such loans after the crisis.

Although the foregoing evidences seems as approving the arguments of Greenspan and Bernanke, who point out the problems related with only unregulated part of the mortgage origination, this was only a part of the story. In fact, the Fed policymakers and other regulators have been full-heartedly in the support of deregulation process<sup>76</sup>. For example, “MCs were a financial innovation that came to life to circumvent ... binding regulatory requirements” enforced on depository institutions; and indeed “[r]egulators knew about this motivation for the MCs’

---

<sup>76</sup> See Greenspan (2008, 2009) for his cases for deregulation even after the crisis.

existence but [they] did not mind” (Demyanyk and Loutskina, 2012:6). Besides, as discussed by Demyanyk and Loutskina (2012), some regulators and policymakers hampered the implementation of consumer compliance regulations. For example, the Home Ownership and Equity Protection Act (HOEPA), which was enforced in 1994, aimed at curbing subprime lending in two ways (Demyanyk and Loutskina, 2012). The first part of the Act, which strictly puts some restriction on subprime lending with aggressive clauses, was ineffective by design and became applicable only for a small portion of the subprime mortgage market (Demyanyk and Loutskina, 2012). The second part aimed at preventing “unfair and deceptive lending practices” and lending that does not fit the borrowers’ affordance. Although it was guidance rather than a law, there were still financial penalties that can be executed on financial firms relying on the second part of the Act (Demyanyk and Loutskina, 2012). Nonetheless, “Congress instructed the Fed to enact them but it was never done under Greenspan. Arguably, the only entities that were affected by this guidance were the depository institutions...” (Demyanyk and Loutskina, 2012:10). Mortgage companies, even the affiliated ones, were not covered with these regulations (Demyanyk and Loutskina, 2012). Moreover, although many states enacted laws similar to the HOEPA, they could not be effective because, alongside other reasons, they faced “proactive regulation avoidance and exemption lobbying done by both depository and non-depository lenders” (Demyanyk and Loutskina, 2012: 10). Thus, preemptive Federal laws enacted and mitigated the effects of state laws<sup>77</sup>. As a result, what the short story of consumer compliance regulations shows is that some policymakers and regulators did not only pass over the potential inconsistencies in regulation or become reckless about dangerous motivations of banks, but also they effectively did their best to make rooms for unregulated banks, i.e. so-called “shadow banks”.

---

<sup>77</sup> Demyanyk and Loutskina (2012:10) give some examples: “[i]n 1996 OTS [Office of Thrift Supervision] issued two preemption rules declaring that state mortgage laws no longer applied to federal thrifts or their subsidiaries. In 2001 the Bush administration decided to use OTS preemption rule to halt state efforts to restrict unfair lending practices (Engel and McCoy (2011)). In 2004 OCC [Office of the Comptroller of the Currency] issued a preemption rule for the national banks excusing them and their subsidiaries from compliance with state consumer protection laws.”

Nevertheless, in general, the lack of regulation and supervision over “shadow banking” sector became one of the most widely mentioned problems after the crisis and many pointed out inconsistencies in the regulation of financial sector<sup>78</sup>. First, there was no meaningful, if any, regulation and supervision about liquidity, capital and risk-related requirements over the shadow banking system (including ABCP vehicles, special purpose vehicles, hedge funds, non-bank mortgage origination companies), some of which significantly contributed to the crisis, as we have also discussed (Bernanke, 2010b; Dodd, 2007). Secondly, despite investment banks (broker-dealer holding companies) were subject to prudential oversight by the SEC, it was not adequate due to opt-in arrangements of supervision that also lacked force (Bernanke, 2010b). Also, even though AIG was subject to prudential oversight from various regulatory agencies, AIG Financial Products department, related with derivatives activities, was subject to “extremely limited” oversight (Bernanke, 2010b). Thirdly, shadow banking system was not subject to disclosure requirement, which created the lack of information about their risk positions (Bernanke, 2010b). All in all, in general, shadow banks, as their name implies, were out of the oversight of regulatory and supervisory agencies and they became a means of regulatory arbitrage exploited by large banks and they became the sources of many excesses in the financial system.

Beside shadow banks, flaws in regulation and supervision of GSEs were also among the causes of the crisis. Well-known two bailed-out GSEs, Fannie Mae and Freddie Mac, had important privileges within the US financial system. Their core activities, in which they act as a duopoly, were pooling, packaging and securitization of conforming mortgage loans and providing credit guarantees –all aimed at facilitating housing finance (Bernanke, 2010b). Moreover, they have another important privilege that allow them to borrow cheaply from federal government resources supported with implicit federal guarantee on these liabilities (Bernanke, 2010b). They also have right to retain MBSs in their portfolios (Bernanke, 2010b).

---

<sup>78</sup> According to Bernanke (2010b), the framework of financial regulation before the crisis involved serious gaps.

According to Levine (2010), this gained great weight relative to their prime activities after the 2000s since they made huge profits during the housing boom. Also, their securities were privileged through the exemptions of registration and reporting to the SEC (Bernanke, 2010b). Finally, they operated with little oversight and regulation on their capital requirements (Bernanke, 2010b). These GSEs were under the regulatory oversight of Office of Federal Housing Enterprise Oversight (OFHEO), a department in the Department of Housing and Urban Development (HUD), until 2008. However, the oversight of the HUD on the soundness and safety of the GSEs was contradictory and created a regulatory gap because the HUD charged with the mission of promoting homeownership with the help of GSEs at the same time (Bernanke, 2010b).

In the context of the crisis, highly leveraged balance-sheet of the GSEs through issuing subsidized debt guaranteed by government and through operating with low capital requirements to buffer their risks became an important source of problems (Levine, 2010). Highly-leveraged position of GSEs brought about large profits for these firms at the cost of increasing systemic risk (Levine, 2010). Greenspan (2010b) argues that the Fed warned in 2004 on the highly leveraged balance-sheets of GSEs that arose from profit-making use of subsidized debt provided by government. On the contrary, Levine (2010) states that even though regulators have drawn attention to ineffective oversight or risky balance-sheets in regard to GSEs and despite investigations over the disclosed accounting frauds in these GSEs during the first half of the 2000s, policymakers, by not taking any measure to address problems, incentivized risk-taking through GSEs. Finally, these two giant GSEs were bailed out by the government at the late stage of the crisis, in September 2008, and implicit guarantees became explicit. All in all, all these privileges bestowed by legal and regulatory framework over the years seems now as significant contributing factors to the crisis.

### 2.5.2. “Government Housing Policy Failure” argument

Several narratives argue that a significant part of the extraordinarily increasing demand for subprime mortgages came from the GSEs in the beginning of the 2000s (e.g. Greenspan 2010a; Wallison, 2010). This argument seems true and it can be confirmed by looking at the Figure.3.10 and Figure. 3.12. Agency MBS security issuance and CMO issuance gradually increased between 2001 and 2003, reaching at its peak to above \$2.5 trillion in 2003. After that agency MBS and CMO issuance remained stable below \$1.5 trillion in each year until 2008. It is pointed out that the immediate cause of increasing demand for MBSs was that Fannie Mae and Freddie Mac were directed to meet “affordable housing goals” that were expanded under the pressure of the Department of Housing and Urban Development (HUD) and Congress at the turn of the millennium (Greenspan, 2010a; Levine, 2010)<sup>79</sup>. Levine (2010:25) added that Community Reinvestment Act (CRA) of 1977 also expanded the mortgage market for GSEs, especially starting with the mid-1990s, under which regulators induced GSEs to lend much more to low and middle income borrowers. According to Greenspan (2010a), this extraordinary demand for MBSs, especially subprime ones, has necessarily driven subprime mortgage originations. Moreover, it is argued that increase in demand and implicit purchasing guarantee for subprime mortgages by GSEs might have given the first signal to the mortgage originators to issue more mortgage loans (Levine, 2010:26). In addition, it is argued that these incentives might have been a cause of the deterioration in underwriting standards (Greenspan, 2010a; Levine, 2010). For example, Greenspan (2010a: 206-7) argues that excessive demand for subprime MBSs caused the mushrooming of ARMs with attractive teaser rates and exotic types of mortgages, accompanied by deterioration in underwriting standards, because the excessive demand could not be met by limited supply of potential subprime borrowers in the absence of these facilitators. In support of this, Demyanyk and van Hemert (2008) find that those loans originated in low- and middle-income areas, i.e. areas with median income below 80 percent of the

---

<sup>79</sup> “In 1996, HUD ... gave Fannie and Freddie an explicit target: 42 percent of their mortgage financing had to go to borrowers with incomes below the median income in their area. The target increased to 50 percent in 2000 and 52 percent in 2005” (Schwartz, 2009:20).

larger MSA median income, displayed an increasing probability of delinquency, after controlling loan and borrower characteristics, and macroeconomic factors. They conclude that this makes a case for the contribution of Community Reinvestment Act of 1977 and GSEs housing goals to the mortgage related vulnerabilities.

Although it is obvious that GSEs have played an important role during the housing boom through securitizing and guaranteeing a significant portion of mortgages or retaining many mortgages in their portfolios<sup>80</sup> by putting a tiny capital against them and relying on government subsidized debt, some of these arguments seem as exaggerating the role of GSEs. In the extreme case, some offers “government housing policy failure” (GHPF) argument. It is an extreme case, because Wallison (2010: 405) states that “the financial crisis was not caused by unregulated mortgage brokers, or by the rating agencies, the Wall Street investment banks, or the commercial banks that eventually had to be rescued with taxpayer funds. The responsible parties were those who made and sustained government policies that distorted the housing finance market—resulting in the creation of an unprecedented number of high-risk mortgages.” Until now, we showed many cases for the contribution of those factors that laundered by Wallison (2010). Nonetheless, we will present and analyze his cases for GHPF view.

Wallison (2009, 2010)<sup>81</sup> argues that government housing policies that begun in the early 1990s and pressed on lenders and GSEs to relax their requirements in mortgage lending, created the bulk of “weak or junk” subprime and Alt-A loans, which, in the end, became the sources of the crisis defaulting at unprecedented rates. One implication of this view is that mortgage originators were not responsible for anything because they only responded to demand created by government housing

---

<sup>80</sup> Greenspan (2010a: 206-7) shows that GSEs retained more than 40 percent of newly packaged subprime MBSs in their portfolios during 2003 and 2004.

<sup>81</sup> Alongside Wallison, Calomiris (2009:69) is another prominent defender of these arguments, which states that “the politicization of Fannie Mae and Freddie Mac and the actions of members of Congress to encourage reckless lending by the GSEs in the name of affordable housing were arguably the most damaging policy actions leading up to the crisis.” We will rely on both of them in this part.

policies (Wallison, 2009)<sup>82</sup>. Wallison (2010) draws attention to two legislations that were passed in the 1990s as indicators of significant changes in government housing policy. Firstly, he points out the enactment of “affordable housing mission” on the GSEs by the Congress in 1992, which required Fannie Mae and Freddie Mac to buy certain amount of mortgage loans (at least 30 percent of all loans initially) that originated for low- and middle-income borrowers. The critics of government housing policies point out increasing percentage of mandatory “affordable” housing loans imposed on GSEs, such as 42 percent in 1996, 50 percent in 2000, 52 percent in 2005 and 55 percent in 2007 (Wallison, 2010; Schwartz, 2009). Wallison (2010: 400) states that “[o]ver time, pressure from ever increasing affordable housing goals forced a profound weakening of the GSEs’ credit culture.” Secondly, Wallison (2010: 400) points out the tightening of Community Reinvestment Act of 1977 (CRA)<sup>83</sup> in 1995, which required that “banks had to show that they had actually made the required loans [to all communities], not that they were simply trying to do so”. According to him, this pushed banks to be “flexible and innovative” in making loans to low- and middle-income groups, even when they were not qualified sufficiently to borrow a mortgage loan (Wallison, 2010). Moreover, he points out the inherent incentives in the banking industry that reinforce the effect of CRA. In order not to be rejected for mergers and expanding their activities due to CRA requirements by regulatory agencies, large banks got involved in collaboration with

---

<sup>82</sup> Wallison (2009: 2) states that “[m]ortgage brokers—even predatory ones— cannot create and sell deficient mortgages unless they have willing buyers, and it turns out that their main customers were government agencies or companies and banks required by government regulations to purchase these junk loans.”

<sup>83</sup> “The CRA had been adopted in 1977, and initially required that banks make efforts to increase mortgage lending in all the communities they serve, not just the communities where middle income or well-to-do families lived. The enforcement mechanism was the withholding of regulatory approval for mergers, expansions, or other matters if a bank had not shown that it was working to achieve the CRA’s goals” (Wallison, 2010: 400). In a different account, Dymski (2009:7) emphasizes on the racial exclusion and redlining of banks before the mid-1970s and attributes the enactment of CRA to the community-based social struggles: “a multi-racial community-based movement ... created the political pressure that led to the Home Mortgage Disclosure Act (HMDA) of 1975 and the Community Reinvestment Act (CRA) of 1977. Respectively, these acts provided a mechanism for monitoring bank loan-making, and precluded “redlining” – the implicit or explicit refusal of lenders to make mortgage credit available to neighborhoods with large minority populations. The CRA required banks to meet the credit needs of their entire market areas, and prevented banks from claiming market areas that excluded minority and low-income populations.”

community groups and made commitments to extend a specified amount loans, according to Wallison (2010). According to him, the amount of all committed loans reached to \$4.5 trillion between 1997 and 2007<sup>84</sup>.

Calomiris (2009) argues that the involvement of two GSEs into the subprime mortgage securitization “crowded in” the private securitization rather than “crowding out”. First, he points out timing of the involvement of GSEs and rising of subprime mortgage origination by giving some descriptive data. He states that “[t]heir aggressive ramping up of purchases of these products in 2004 coincided with the acceleration of subprime growth. Total subprime and Alt-A originations grew from \$395 billion in 2003 to \$715 billion in 2004 and increased to \$1,005 billion in 2005” (Calomiris, 2009: 69). Secondly, he points out their “market maker” role by setting standards and influencing pricing. Finally, both Calomiris (2009) and Wallison (2010) point out the effect of assurance provided by GSEs on purchasing subprime mortgages to declining underwriting standards.

For the relationship between subprime collapse and the outbreak of financial crisis, Wallison (2009; 2010) brings the role of two GSEs at the center again. Wallison (2010: 403) argues that “Fannie and Freddie’s failure to accurately report their loans may have overturned market expectations about the delinquency and default rates that could be expected when the inevitable collapse of the bubble occurred.” He states that investors’ expectations that private MBS losses would be small and weakly effective in any case was reasonable since they did not know “that Fannie and Freddie had made over a trillion dollars in subprime and Alt-A loans that were reported as prime loans” (Wallison, 2010: 404). According to him, this contributed to increasing the extensity of defaults and drove housing prices down

---

<sup>84</sup> Wallison (2010: 401) states that “[t]he numbers here [in committed loans] were very large, dwarfing the amounts of CRA loans that were produced by community banks in their local service areas. According to the National Community Reinvestment Coalition’s 2007 annual report, the group succeeded in getting commitments for CRA-type mortgages and other lending that exceeded \$4.5 trillion between 1997 and 2007. Another \$1trillion was committed by Countrywide, the first national lender to sign HUD’s CRA-like Declaration of Fair Lending Principles and Best Practices in 1994. Ninety-four percent of all announced CRA/HUD commitments can be traced to Countrywide and the four largest U.S. banks—Bank of America, Citigroup, JPMorgan Chase, and Wells Fargo, including the banks they later acquired.”

further. Alongside its contribution to increasing number of defaults, “ignorance about who was actually holding these loans” resulted in the sudden loss of confidence among financial institutions, so precipitated the financial crisis, according to Wallison (2010:403). Finally, Wallison (2010:402) argues that since more than two-thirds of all subprime and Alt-A loans (27 million) “were held or guaranteed by government agencies like FHA (about 4.8 million), and the GSEs Fannie and Freddie (12 million loans), and by U.S. banks (a residual of about 2.2 million) that were required to make them under the CRA”, this made the government housing policies underlying cause of the crisis.

Beside the exaggeration on the role of a single factor while explaining the crisis, these arguments have other problems. At first, these views attribute the emergence of subprime market to two legislations that passed in the first half of the 1990s. However, as we have emphasized throughout this chapter, the advancement of securitization was one of the most important factors that paved the way for the rise of subprime borrowing. As aptly put by Fostel and Geanakoplos (2011), it is dubious that subprime securitization would begun without the advancements in securitization. They state that “the tranching of subprime mortgages couldn’t have begun earlier, because it had to wait for the innovation of CMO tranching” (Fostel and Geanakoplos, 2011:3). This means that successiveness in the advancement of financial innovations limits the development of other things, subprime mortgage in this case. As also pointed out by Dodd (2007:17), “[t]he key to moving subprime mortgage debt through the market was to divide up the risk, creating low-risk investment grade segments and higher-risk (lower-rated) segments from the pool of mortgages. To do this, Wall Street used the collateralized debt obligation, which was created in 1987”. However, these do not mean that the rise of subprime mortgages can be induced only by the development of securitization. There are different kinds of accounts that point out many other developments in the regulatory area or in the private sector. For example, Chomsisengphet and Pennington-Cross (2006) gives a different narrative for the development of the subprime mortgage market. They point out the effect of abolishment of interest rate caps, allowance to variable interest rates

and balloon payments, tax reforms that exempt mortgage loans, all of which passed in the 1980s, on the development of subprime borrowing. Moreover, they give a detailed story of changing macroeconomic and market conditions, such as interest rate changes, the rise of non-depository institutions in the 1990s<sup>85</sup>, and the short boom-bust cycle of subprime lending between 1995 and 1998, which paved the way for a new rise starting with 2001. Nevertheless, they explicitly state, too, “[a]lthough the subprime mortgage market emerged in the early 1980s with the adoption of” those foregoing deregulations, “subprime lending rapidly grew only after 1995, when MBS with subprime-loan collateral become more attractive to investors” (Chomsisengphet and Pennington-Cross, 2006: 41). All in all, all these point out a very complex story of the development of subprime mortgage market, especially giving a significant role for the advancements in securitization. Thus, the rise of subprime borrowing cannot be induced only two legislations.

Besides, government housing policy failure view exaggerates the role of GSEs in the financial crisis and do not answer the question of how the financial system came to the brink of near-collapse with a relatively small shock according to its size arisen from the subprime mortgage sector. According to Sinn et. al (2009)’s chronology of events, the problems of Fannie and Freddie reveals only in the summer of 2008. Moreover, it is interesting to note that Wallison (2010: 402) states that “the loans bought and securitized by Fannie and Freddie”, or guaranteed by Federal Housing Administration (FHA) and securitized by Ginnie Mae “did not cause losses to investors or to the financial institutions that held them” because of the implicit and explicit government guarantees to these firms. Then, how defaults of these loans could shake investor confidence is dubious. Nonetheless, Calomiris

---

<sup>85</sup> Dymski (2009: 7) also points out the new entrants of the mortgage market: “[t]he crisis of the savings-and-loan (thrift) industry in the 1980s made it clear that lenders in the mortgage market had not performed optimally in deciding on which mortgages to make and under what terms. The locally-based thrift industry was perceived as having failed in large part because moral hazard had dominated profit-and-loss considerations in its loan-making. In exchange for the federal assistance provided to clean up the mess, the mortgage market was opened to new lenders. And to permit new entrants into the supply side of the mortgage market, rules on bank-holding company purchases of non-bank lenders were loosened.”

(2009:69-70) states that “the GSEs stayed in these [subprime and Alt-A] markets long after the mid-2006 flattening of house prices, which signaled to many other lenders the need to exit the subprime market; during the last year of the subprime and Alt-A origination boom, when originations remained near peak levels despite clear evidence of impending problems, the GSEs were crucial in maintaining financing for subprime and Alt-A securities.” Although how GSEs precipitated to exit of private lenders from the subprime market and contributed to the crisis is dubious –because, during 2006 and the first half of 2007, many mortgage origination firms was going into bankruptcy or merging with larger companies compulsorily (see Section.3.1)- the GSEs might have played an important role in the rise of mortgage defaults by staying in the market during 2007 and 2008, while at the same time private investors and securitizers exited the market (see Table.2.2).

Table 2.2 Mortgage Outstanding Debt by Type of Holder (all types of mortgages), 2006-2009Q4, Millions of Dollars.

Type of Holder	2006	2007	2008	2009Q4
All holders	13,457,799	14,515,586	14,605,464	14,315,915
<b>Major financial institutions</b>	4,783,614	5,064,584	5,044,409	4,778,095
Commercial banks	3,403,052	3,644,402	3,841,395	3,818,667
Savings Institutions	1,076,762	1,094,009	860,586	633,327
Life insurance companies	303,8	326,173	342,428	326,101
<b>Federal and related agencies</b>	687,452	725,455	797,268	816,071
Government National Mortgage Association [GINNIE MAE]	27	22	41	152
Farmers Home Administration	76,448	78,411	82,517	88,364
Feder Housing Admin. and Dept. of Veterans Affairs	3,796	3,7	3,464	4,257
Federal Deposit Insurance Corporation	3	226	9,808	15,613
Federal National Mortgage Association [FANNIE MAE]	383,045	403,577	429,493	416,543
Federal Land Banks	59,897	67,423	76,503	80,329
Federal Home Loan Mortgage Corporation [FREDDIE MAC]	65,536	79,776	107,591	138,816
Federal Agricultural Mortgage Corporation	778	768	786	760
<b>Mortgage pools or trusts</b>	6,596,447	7,400,131	7,545,644	7,576,343
Government National Mortgage Association [GINNIE MAE]	410,021	443,461	636,612	880,27
Federal Home Loan Mortgage Corporation [FREDDIE MAC]	1,450,721	1,717,342	1,801,735	1,838,919
Federal National Mortgage Association [FANNIE MAE]	1,977,194	2,299,072	2,518,408	2,652,720
Private mortgage conduits	2,755,328	2,935,713	2,584,216	2,199,948
Federal Agricultural Mortgage Corporation	3,183	4,543	4,673	4,486
<b>Individuals and others</b>	1,390,287	1,325,416	1,218,143	1,145,407

Source: Federal Reserve Bank, author's own reorganization.

Notes: "Other holders include mortgage companies, real estate investment trusts, state and local credit agencies, state and local retirement funds, noninsured pension funds, credit unions, and finance companies." "Federal and related agencies"-subheading includes mortgage loans, while "Mortgage pools and trusts"-subheading include mortgage-backed securities and other structured products. Besides, since the data includes non-residential mortgages, such as farm and commercial mortgages, some of the numbers may be deceptive. For example, one-third of mortgage debt outstanding held by commercial banks is commercial mortgage. Nonetheless, the numbers of Ginnie Mae, Fannie Mae and Freddie Mac include only residential mortgages. Also, we should note that rapid decline in the mortgage debt held by private mortgage conduits reflect almost completely the decline in 1-4 family mortgages.

In conclusion, government housing policy failure view exaggerates the role of the housing policy legislations in the rise of subprime mortgage lending and the role of GSEs in the rise of subprime mortgage boom during the 2000s. Although it is obvious that GSEs might have created an important demand for subprime mortgage origination, it is also obvious that private sector subprime mortgage securitization has evolved and developed at the beginning of the 2000s with the experience of 1998 collapse in subprime mortgage market; and subprime mortgage originators became much more consolidated at the beginning of the 2000s (Chomsisengphet and Pennington-Cross, 2006). Moreover, this one-sided view does not account for how significant vulnerabilities accumulated in the financial system. Last but not least, this view seems turning the truth on its head, as it is aptly put by Dymski (2009:5), who argues that “lenders’ innovation of providing minority households with access to mortgage finance via predatory loans [referring to all types of subprime loans] was an independent root of the current crisis.” In fact, the main actors were lenders, not the housing policies. Financial innovations, new practices and governments’ new regulations (deregulations) allowed much more lenders for the entrance into mortgage market rather than government housing policies.

## **2.6. Conclusion**

In this chapter, we covered some of the possible causes of the recent financial crisis that are related with the US financial system itself and its evolution. Firstly, we provided our cases for the contribution of some financial innovations to the crisis by relying on the literature. We argue that they significantly contributed to the development of mortgage credit boom, increased leverage and excessive accumulation of risks in the financial system. By allowing off-loading originated loans from the balance-sheet of banks, securitization allowed liquidity in lending and contributed to the emergence of mortgage credit boom. It created incentives for appropriating much more fee income through financial mediation and changed the sources of bank profits partly. Thence, it contributed to relaxing of lending standards gradually. In addition, it created incentives for avoiding of costly screening activities, especially in subprime mortgage market, which, in turn, prepared the

ground for the deterioration of underwriting standards in subprime loans and their defaults gradually. Moreover, securitization allowed banking system to exploit regulatory arbitrage arisen from Basel capital adequacy arrangements. With the extensive use of off-balance-sheet vehicles, this exploitation of regulatory arbitrage allowed especially large banks to increase their effective leverage. It also allowed banks to expand their balance-sheets since it generated high-rated products from risky and costly underlying loans. All these developments created also dependence on short-term wholesale borrowing markets, which makes the system vulnerable to liquidity risk in the case of small shocks. Besides, although evidences are clearly not enough, by significantly contributing to mortgage credit boom, securitization might have been one of the most important underlying causes that created housing price boom, which, of course display self-reinforcing dynamics throughout the process. Alongside securitization and off-balance-sheet vehicles, derivatives, especially CDSs that grew substantially before and during the crisis, created incentives for manipulations in the financial markets, affected housing prices and allowed to bet against the defaults. Also, they created non-transparency, resolution or settlement problems and helped creating new contagion channels making counterparty risk evaluation difficult. In sum, these financial innovations created significant vulnerabilities in the financial system by contributing to subprime mortgage boom and housing price boom, undercapitalization of banking system, excessive risk-taking, increasing dependence on the wholesale funding markets, high leverage and asset price movements.

Although it seems that these financial innovations explain much of the story, they are not enough to explain the depth of the crisis. We think that high system-wide leverage and self-reinforcing feedback mechanisms that mainly work through the interaction between asset prices and balance-sheet of financial firms may explain the depth of the crisis and perennial deleveraging process. In this chapter, we showed that household leverage became an important determinant of loan performance before the crisis and increasing leverage of large commercial banks and investment banks created significant vulnerabilities in the financial system. Although large commercial banks' leverage was concealed by the traditional measures of leverage,

some of them were, in effect, highly-leveraged through their off-balance-sheet vehicles. On the other hand, investment banks increased their leverage explicitly after 2004, just when new regulatory arrangements effectively delimited the level of leverage for them. Besides, for the largest banks and investment banks, the active management of balance-sheet and equity capital according to market prices of assets and perceived risks, created tendencies toward procyclical balance-sheet expansion or contraction and procyclical leverage. Asset price changes immediately influenced net worth of these large banks. Since they targeted either their risk-based equity capital or their leverage ratio, asset price increases that brought about surplus capital, required expansion of balance-sheets, which was materialized through short term-borrowing, long-term lending and investing in securities. On the other hand, balance-sheet expansion and increasing leverage of both households and financial firms have strong tendencies to put more pressure on asset prices. Thus, the cycle of feedback between asset prices and leverage becomes completed. Moreover, since all these self-reinforcing mechanisms work in the inverse direction, the interaction between asset prices and balance-sheet and leverage exacerbate the problems during the crisis. Those balance-sheet and equity capital management methods require the contraction of balance sheets during the crisis. Also, rising margins (haircuts) due to sharp and unexpected price decline create a vicious cycle between increasing margins and deleveraging.

What is more, there are strong cases for the role of inveterate practices arisen from short-term-performance based remuneration schemes. These generate short-sightedness and excessive risk-taking. Also, these practices seem to be reinforced and perpetuated through competition among financial firms, procyclical mentality of financial agents and market participants, and finally through consolidation of financial stock ownership within the financial system. Moreover, there were other perverse incentives pervaded the financial system that arisen from past regulations, legislations and consolidated beliefs with regard to policymakers' actions. For example, we showed that the interests of credit rating agencies were aligned with both security issuers and security investors on inflating ratings. Moreover, it seems that bailouts of the last decades might have contributed to the belief over that

government would always step in for the large financial institutions during hard times. This contributed to excessive risk-taking of these large firms. In conclusion, all these incentive problems, as the products of established traditions, changing regulations and legislations, might have been exacerbated the development of housing boom.

Last but not least, we argued that regulatory inconsistencies and failures, mostly as the product of three-decades long deregulation process helped cause the emergence of severe excesses in the financial system. We touched upon several aspects of regulatory problems throughout the chapter. Firstly, capital adequacy requirements set by Basel accords and national complementary regulations created incentives to establish off-balance-sheet vehicles in order to exploit regulatory arbitrage and leverage effectively. Secondly, inefficient regulations and supervision of some firms, such as GSEs and large investment banks, might have contributed to leverage and enhanced self-reinforcing feedback mechanisms by allowing the avoidance of balance-sheet constraints. Thirdly, we argue that the lack of integration and consistency in the setup and implementation of banking regulations created a shadow banking sector, whose actions culminated in high leverage, oversize balance-sheets, and excessive risk-taking; and contributed to the development of mortgage credit boom. Analyzing the mortgage companies (a part of shadow banking sector) in a detailed way, we showed that bank holding companies became able to originate riskier loans by holding less, if any, capital against them and shield from the losses of such loans after the crisis. Moreover, we showed some examples of how policymakers and regulators did not only pass over the potential inconsistencies in regulation or become reckless about dangerous motivations of banks, but also they effectively did their best to make rooms for shadow banks. Finally, we pointed out some of the problems in the regulation and supervision of the GSEs and their privileges that resulted in high-leverage. Moreover, analyzing and objecting the “government housing policy failure” view, we stated that GSEs might have created significant portion of the demand for subprime mortgage origination at the beginning of the 2000s, nonetheless, subprime mortgage boom cannot be induced to this factor

only and it cannot explain how financial system accumulated so much vulnerabilities that brought itself to the brink of collapse.

Beside these main points in this chapter, we presented some evidences on the causality between credit boom and housing price appreciation, both of which fed each other throughout the process. Thus, we argue that housing prices soared mainly because of the mortgage credit boom that characterized by lowering lending standards and increasing household leverage. It follows that the decline of housing prices was inevitable, not because of sudden changes in the psychological conditions of market participants but mainly because of the inner boundaries of the credit boom and accompanying household leverage. Considering that all these factors was, to a great extent, the products of financial liberalization process, financial innovations and new practices, we can argue that housing price boom was the product of them, too.

All in all, we argue that financial liberalization process of the last three decades was most likely one of the most significant underlying causes of the crisis. The recent financial liberalization process can be characterized by gradual deregulation, emergence of new financial practices and financial innovations, consolidation of perverse incentives and amplification of self-reinforcing feedback mechanisms, alongside consolidation and integration of the banking system. We made strong cases for the contribution of nearly all of these characteristics of the recent financial liberalization to the crisis. Thus, it is fair to say that financial liberalization was one of the most significant underlying causes of the crisis. Nonetheless, this process cannot be considered as the product of a mere change of chosen policies or changing ideological environment in the field of economics. Financial liberalization of the last three decades represents a part of the structural transformation of the world economy. This transformation should be read as the response and the consequence of the problems of capitalism that revealed in the 1970s. In this respect, a part of the Marxist literature on the causes of the recent crisis stresses on this point and points out important factors that paved the way for financial liberalization (e.g. Foster and McChesney, 2010; Kotz, 2008). Although, we do not directly elaborate on these

points while discussing the arguments of this literature, the fifth chapter will present some of the possible causes of the recent financial liberalization and we will rely on them while presenting our synthetic explanation to the crisis in the concluding chapter.

The main argument of this chapter is mostly similar to that of Lapavitsas (2009), Dymski (2009) and Crotty (2009). In most clear terms, Crotty (2009: 564) states the view like that: “[a]fter 1980, accelerated deregulation accompanied by rapid financial innovation stimulated powerful financial booms that always ended in crises. Governments responded with bailouts that allowed new expansions to begin. These in turn ended in crises, which triggered new bailouts. Over time, financial markets grew ever larger relative to the nonfinancial economy, important financial products became more complex, opaque and illiquid, and system-wide leverage exploded. As a result, financial crises became more threatening. This process culminated in the current crisis, which is so severe that it has pushed the global economy to the brink of depression.” On the other hand, Lapavitsas (2009), calling the process as “financialization”, draws attention to noteworthy features and roots of the financial liberalization process. According to him, two features characterize “financialization”: commercial banks have turned to the individuals instead of corporate sector throughout the process and they have turned to financial market mediation by acquiring investment bank practices. He argues that these has been arisen from “successive waves of mergers and acquisitions ... among ‘financialized’ corporations”; developments that allowed corporate sector to raise funds from expanding open financial markets, which narrowing the scope of commercial bank lending in the end; deregulations that eroded social provisions in housing, pensions, education, and so on, leaving the household sector in the hands of banking sector; and finally the abolition of the Glass-Steagall Act in 1999, that confirmed and promoted financial mediating practices of commercial banks (Lapavitsas, 2009). Thus, Lapavitsas (2009) relates those two features of “financialization” directly with the crisis. Finally, Dymski (2009), sharing the same approach with Lapavitsas (2009) on the arguments about banking sector transformation, mainly argues that “lenders’ innovation of providing minority households with access to mortgage finance via

predatory loans [referring to all types of subprime loans] was an independent root of the current crisis” and this was linked to the banking sector transformation in the last instance. As a result, we think that these views both provide strong support to our arguments and give new insights to further research and discussion.

## CHAPTER 3

### MONETARY POLICY AND THE CRISIS

It is very common to attribute the causes of the crises to the failures of government or economic policymakers. Invariably, policies of the Federal Reserve (Fed) have been at the center of recent debates along with other political interventions. According to critics, the Fed contributed to housing boom for two reasons: firstly, for its negligence of supervisory and regulatory role, which we have discussed partly in the previous chapter; secondly, for its loose monetary policy after the 2001 recession, arguing that it lasted unduly for too long. The aim of this chapter is to comprehend the role of monetary policy in explaining the crisis by focusing mostly on the latter argument. In general, this chapter focuses on possible effects of monetary policy on the recent crisis with a special emphasis on the link between monetary policy and interest rates and asset bubbles.

Although the role of monetary policy can be found in some other explanations as a part of the causes of the crisis, its exclusive role will be presented here. One of the most prominent defender of the specified argument who brings exclusive and direct role of the monetary policy into question was John Taylor (2007, 2009)<sup>86</sup>. This

---

<sup>86</sup> See O'Driscoll Jr. (2009), Posner (2009), Sachs (2008), Schwartz (2009), Zywicki (2009) for some of the supporters of this view. Obstfeld and Rogoff (2009) agree with Taylor, but, placing the role of monetary policy next to global imbalances and financial market problems. What is more, Obstfeld and Rogoff (2009) quote two declarations stated in 2004 by which some members in the Federal Open Market Committee of the Fed and the then European Central Bank Chairman Jean-Claude Trichet expressed their concerns over the role of easy monetary policy on housing boom and excessive risk-taking. The former states that accommodative policy for so long “might be encouraging increased leverage and excessive risk-taking. Such developments could heighten the potential for the emergence of financial and economic instability when policy tightening proved necessary in the future” (Obstfeld and Rogoff, 2009: 17). The latter states that “[t]his very low level of interest rates also fuels private

chapter mostly draws on the discussion about his arguments. John Taylor (2009) argues that the main cause of the crisis was “monetary excess” in the US, which was driven by prolonged easy monetary policy during the period of recovery after the 2001 recession. His reasoning, firstly, depends on that monetary policy was loose between 2002 and 2006 according to historical standards, and also it was a discretionary deviance. Secondly, this discretionary loose monetary policy paved the way for excessive housing investment and housing price inflation. Finally, when the federal funds rate (hereafter, ffr) returned to normal levels, it reversed the mechanism, which in the end paved the way for the meltdown of subprime mortgage markets, leading to the meltdown in all securities connected with them.

These arguments are based on three consequential steps that are required robust demonstrations. First, it should be shown that there was inappropriately loose monetary policy or “monetary excess” arisen from easy monetary policy in the US for the given period. Second, a clear specification of the transmission mechanisms between interest rates and housing bubble is needed. In so doing, a ground for the empirical analysis should be established. Finally, how the reverse mechanism caused the meltdown of subprime mortgage market and why the collapse in the mortgage market froze the financial markets should be explained.

Besides the arguments that focus on possible direct effects of the Fed, some points out recklessness of the Fed monetary policymakers to the emerging housing bubble. A corollary of this view is that the Fed should have reacted to the rising asset prices by adjusting monetary policy. If this were the case, it could prevent the housing bubble or mitigate the effects of it.

Analyzing some of the core points of these arguments, we mainly argue that easy monetary policy stance of the Fed does not seem as a contributing factor to housing boom in the way that these arguments imply. Also, the previous chapter shows that tightening of monetary policy was not significant factor among the

---

sector demand for credit. In particular, the demand for loans for house purchases is strong, supported by strong house price dynamics in several euro area countries” (Obstfeld and Rogoff, 2009: 18).

triggers of the subprime collapse<sup>87</sup>. Moreover, we claim that there is not any significant sign of contribution by the Fed's monetary policy stance to "monetary excess". Finally, we argue that even though there are plausible cases for the reaction of monetary policy to asset bubbles, the Fed could not have eased down housing price boom easily. The last point and the main body of our arguments rely on well-supported observation on gradually declining effectiveness of monetary policy on market prices in recent decades.

The structure of this chapter is as follows. First, it will focus on whether monetary policy was inappropriately loose or not. Second, how monetary policy could affect housing prices and cause excessive risk-taking will be analyzed. Third, it will be discussed whether monetary policy could prevent the bubble.

### **3.1. Was monetary policy inappropriately loose?**

According to Taylor (2007, 2009), monetary excess existed after the 2001 recession in the US because the Fed rate (ffr) was well below the rate indicated by "Taylor rule" framework and the experience of the recent two decades<sup>88</sup>. Firstly, Taylor (2007, 2009) submits a counterfactual analysis that depends on a comparison between the actual ffr path and a counterfactual ffr path, which is calculated within the Taylor rule framework. Following Taylor's suggestions, Bernanke reproduces this counterfactual analysis by concluding that "the actual federal funds rate is below the values implied by the Taylor rule – by about 200 basis points on average over this five-year period" (Bernanke, 2010a: 7) (see Figure 3.1). Secondly, Taylor (2007) touches upon the predictable and systematic interest rate policy regime of the

---

<sup>87</sup> See especially the first parts of the second chapter.

<sup>88</sup> Taylor rule is an equation which gives how much a central bank should respond to the changes in inflation and output by arranging the nominal interest rate set by it. According to Bernanke (2010a), general form of Taylor rule is as follows:  $i_t = r_t^* + \pi_t + a(\pi_t - \pi^*) + b(y_t - y_t^*)$ ; where  $i_t$  is the prescribed value of the nominal interest rate set by central banks in a given period  $t$ ;  $r_t^*$  is the assumed equilibrium real interest rate which is calculated as 2 for the US case;  $\pi_t - \pi^*$  is the deviation of actual inflation ( $\pi_t$ ) from the target inflation ( $\pi^*$ ) in period  $t$ ;  $y_t - y_t^*$  is the output gap, which is the deviation of actual output ( $y_t$ ) from its potential ( $y_t^*$ ) in period  $t$ ; and finally,  $a$  and  $b$  are specified parameters.

so-called “Great Moderation” era, after the 1980s. For him, there were also some deviations from the standards during the “Great Moderation”, but the final one was “the biggest deviation, comparable to the turbulent 1970s” (Taylor, 2007:2). He provides another indirect example for “monetary excess” by showing that CPI inflation was on average 1.2 percentage points above the target during 2002-07 (Taylor, 2009:6). Thirdly, even though there were some “good reasons” for loose monetary policy, such as the fear of deflation during the period from 2002 to 2004, this was a discretionary Fed intervention with which the Fed deviated from the rule or the regular framework based on the macroeconomic variables (Taylor, 2009:3-4). Thus, these evidences, according to Taylor, show that there was a discretionary monetary policy that caused monetary excess in the period preceding the financial crisis.

### The Target Rate and the Taylor Rule Prescriptions Using Real-Time Inflation Forecasts

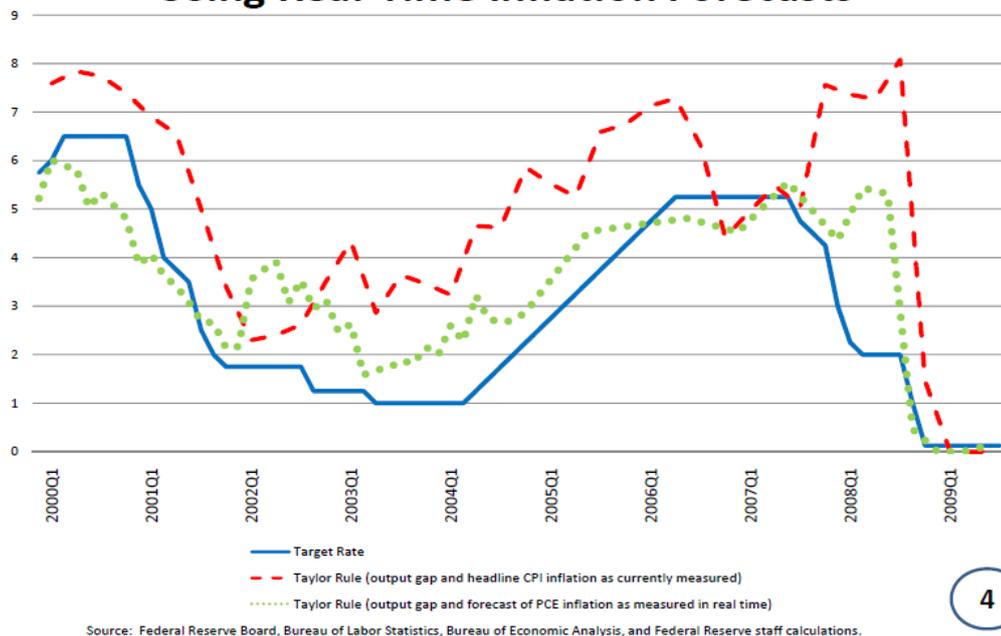


Figure 3.1 The Federal Funds Rate and Different Taylor Rule Prescriptions

Source: Bernanke (2010a).

On the other hand, Bernanke (2010a) argues that monetary policy stance of the Fed was not inappropriate according to macroeconomic conditions and medium-term objectives of policymakers. At first, the limitations of simple policy rules and methodological problems in Taylor's analysis are pointed out. Bernanke (2010a:5) states that these rules can be used "as guidelines, not as substitutes", because they are "only rules of thumb" and their construction may be encountered by important disagreements. Furthermore, these rules leave out important relevant factors that can be used to make effective policy to address particular risks, such as deflationary tendencies, for Bernanke (2010a:5). Also, Greenspan (2008, 2009) downplays the conclusions derived from Taylor's rule by implying the inability of such frameworks to anticipate the onset of crises. He argues that Taylor's analysis inappropriately carries empirical relationships of earlier periods to the recent past. As a result, the last two chairmen oppose the use of simple rules in this debate because of their inappropriateness as a base for policymaking and for policy analysis.

In addition, Bernanke (2010a:5-9) draws attention to the criteria to calculate the counterfactual path of  $\pi$  by using Taylor rule. Since the specified parameters of the responsiveness of monetary policy to the output gap matters for different conclusions, there may be disagreements with Taylor rule implications. Also, since how you measure the output and inflation gaps matters, using different measures, such as PCE price index instead of CPI index, one may reach different conclusions. Moreover, and most importantly for Bernanke (2010a), Taylor rule depends on "currently observed" values instead of forecasts, but monetary policy works with a lag. For him, even though this does not always matter so much, it gained importance during the last decade because of those surges in energy prices and their effects on overall inflation. Since Taylor rule makes no distinction between whether these inflationary pressures will be temporary or permanent, it implies directly a tighter monetary policy. Considering foregoing critics, Bernanke (2010a) carries out a new counterfactual  $\pi$  path by substituting PCE price index for CPI measure and by using forecasts instead of current values within the original Taylor rule framework (See Figure 2.1). This alternative rule exhibits a closer path to the actual one followed by the Fed. Therefore Bernanke (2010a:10) concludes that "when one takes into account

that policymakers should and do respond differently to temporary and long-lasting changes in inflation, monetary policy following the 2001 recession appears to have been reasonably appropriate, at least in relation to a simple policy rule”.

Besides, critics of Taylor argue that monetary policy of that certain period was appropriate due to the weak recovery in the aftermath of the 2001 recession and the potential danger of deflation, so it was not discretionary. Greenspan (2008) emphasizes on the sluggish recovery and contends that the period in which the rate of inflation fall quite low levels was not suitable to tighten monetary policy<sup>89</sup>. With an emphasis on the risk of getting stuck in the low interest rate levels –referring to the Japanese case during the 1990s-, Bernanke (2010a:4) says that “when faced with the risk of hitting zero lower bound, policymakers should lower rates preemptively”. In addition, Obstfeld and Rogoff (2009:15) touch upon the role of concerns over potential economic uncertainties with regard to Iraq war in monetary policy setting. Finally, Bernanke (2010a:11) shows that foregoing alternative Taylor rule supports the appropriateness of actual monetary policy path to macroeconomic conditions.

On the other hand, according to Henderson and Hummel (2008), interest rates are not appropriate to evaluate monetary policy since the market determines them. Moreover, indicators on monetary aggregates, which the Fed directly controlled, downplay the arguments of Taylor because growth rates of monetary aggregates (MZM, M1 and MB) gradually declined to very low levels from 2000 to 2006, even ffr was low (Henderson and Hummel, 2008). In addition, during the Greenspan era, monetary base (excluding the currency demand from abroad) was almost frozen and broader monetary aggregates (M2, MZM, M3) and reserves market were determined mostly by the market due to deregulations (Henderson and Hummel, 2008: 3-5), alongside financial innovations (Kuttner and Mosser, 2002:15).

As a result, there is an ongoing and inconclusive debate whether there was excessively loose monetary policy or not. There seems no strict and common way to

---

<sup>89</sup> See also Greenspan (2004), who provides better outlook of that periods and also makes a case for the importance of judgments and discretions beyond the policy rules and models due to uncertainties and risks in monetary policymaking.

measure the existence of “excess”. First, when simple rules are used to evaluate deviations, the construction of models and assigned parameters affects results. On the other hand, the Fed uses specified and more complex models to determine the path of ffr justified by its appropriateness to macroeconomic environment. However, then, it became self-evident that monetary policy stance of the Fed was compatible with macroeconomic conditions. Second, even though Taylor does not specify what he meant by “monetary excess” and only deals with low level of ffr, when the concept is defined as including broader monetary aggregates, there may remain little role for the Fed’s monetary policy in determining them because of financial deregulation and innovations. Thus, it cannot be adjudicated that the Fed loosened monetary policy and this was the root of all the problems. However, since the Fed mainly aimed at and kept affecting the market interest rates through controlling ffr, despite the arguments that its influence has gradually declined<sup>90</sup>, it is still possible to argue that loose monetary policy (with regard to low level of ffr) may create the conditions that pave the way for the crisis through affecting market interest rates without assessing its appropriateness. The next section will focus on this question.

### **3.2. The relationship between the Federal Funds rate and housing boom**

The existence of loose monetary policy, pulling down ffr after the dot-com burst, might have influenced many important variables such as mortgage interest rates that could directly affect housing boom. Also, monetary policy could have influenced available credits or perceptions and expectations about the economy via different channels. When housing become “the target of desire” at the earlier periods of boom, low interest rates might have facilitated borrowing to acquire these assets, as argued by Schwartz (2009). To make the argument that the Fed monetary policy is to blame for the crisis valid, the most important step is to show the relationship between ffr and housing boom. The very first step is to establish theoretically possible transmission mechanisms of monetary policy with regard to housing sector.

---

<sup>90</sup> See e.g. Henderson and Hummel (2008) or Kuttner and Mosser (2002). For the studies that directly elaborate on such views, see e.g. Cömert (2013) and D’arista (2009).

To provide a basic framework on this and further discussions, these possible mechanisms of the relationship between interest rates and the housing market will be classified, at first. Then, the cases for and against John Taylor's arguments will be analyzed.

### **3.2.1. Monetary Policy Transmission Mechanisms and Housing Market<sup>91</sup>**

#### **3.2.1.1. Interest rate channel**

Theoretically, by the user cost of capital framework<sup>92</sup>, the first and foremost direct effect of the decline in long-term real interest rates was a decline in fixed-rate mortgage rates. This decline in mortgage rates decreases the user cost of capital thereby increases the housing demand. Moreover, when housing demand increases under the condition of housing supply constraints<sup>93</sup>, housing prices will be appreciated with the optimistic expectations on further housing price appreciation. These expectations on housing price appreciation reduce the user cost of capital paving the way for the rise in housing investment demand. Therefore, if monetary policy affects long-term interest rates, then it can also affect housing demand and prices, too. In addition, when housing prices are considered as in the case of the calculation of financial asset prices, i.e. assuming that the present value of an asset (housing) is determined by discounting the value of future payments (rents) with expected market interest rates, it can be argued that the Fed may have influence on housing prices through affecting expectations on future interest rates.

---

<sup>91</sup> Theoretical presentations of the arguments in this part draw mostly on Mishkin (2007). For the classifications here, it is benefited from the classifications about general monetary transmission channels on the overall economy (Kuttner and Mosser, 2002 ; Özatay, 2011b)

<sup>92</sup> Mishkin (2007:5) states that “[s]tandard neoclassical models of housing activity view the user cost of capital as an important determinant of the demand for residential capital” and gives the basic equation, which is as follows:  $uc = ph [(1 - t)i - \pi_h^e + \delta]$ ; where  $uc$  is the user cost of capital,  $ph$  is the relative purchase price of new housing,  $t$  is the marginal tax rate,  $i$  is the mortgage rate,  $\pi_h^e$  is the expected housing price inflation rate and  $\delta$  is the depreciation rate for housing.

<sup>93</sup> According to Mishkin (2007:8), this was the case for the US.

For all these long-term interest rates related mechanisms, monetary policy may play a role on housing market through the interest rate channel by which the central bank can affect long-term interest rates predicating on the assumption that long-term interest rates are linked to the expected future short-term interest rates and central banks may steer the expectations on these future short-term rates. Finally, short-term interest rates may influence directly the cost of financing home construction, so monetary policy can affect directly the supply side of the housing market.

### **3.2.1.2. Wealth channel**

Wealth channel effect can be fed by and feed into an existing or a starting housing boom. Monetary policy may have influence on this channel at some point. Wealth effect on households becomes at work as housing prices appreciate. When housing prices appreciate, households will be relaxed on their spending and borrowing due to more potential collaterals for homeowners. If residential mortgages, home equity loans or home equity withdrawals are available to households, and when mortgage markets are effective in decreasing costs for these services, then with housing appreciation, households will spend and borrow easily, driving the aggregate demand up. Therefore, this may create favorable environment to expect further appreciation in prices and these expectations increase housing demand in a self-feeding way. Since lower interest rates raise asset prices, the wealth channel effect can be prompted by monetary policy<sup>94</sup>, basing on the foregoing assumption on the determination of present value of an asset.

### **3.2.1.3. Balance-sheet, credit channels**

Firstly, under the assumption that some credit-constrained households are influenced by current cash flows, balance-sheet, credit channel effect of monetary policy may play a role on housing demand. This mechanism may work in two ways.

---

<sup>94</sup> Surely, any factor that causes housing price appreciation may prompt wealth channel effects. Indeed, global imbalances literature accentuate more on this channel, since it may be the mechanism that decreased saving rates due to increasing consumption and cheap borrowing conditions based on appreciated collaterals, thereby causing current account deterioration in countries that experienced housing boom.

First, even where real interest rates remain unchanged, lower nominal interest rates increase current cash flow of household through lower expected inflation that discounts the real stream of interest payments to the present. Second, when the credit-constrained households who have variable-rate mortgages apply for the rule of thumb in the case of lowering nominal interest rates, they will have lower interest payments, getting more current cash flow. By two different ways, increases in cash flows may increase the size of mortgages that credit-constrained households afford, thereby housing demand may increase.

Secondly<sup>95</sup>, balance-sheet, credit-channel effect of monetary policy on the financial sector may play a role by increasing available credits to housing market, thereby facilitating to acquire mortgage loan and increasing housing demand. This mechanism works in three ways. First, if financial intermediaries are not able to raise their liabilities easily in order to extending credits, central banks may affect the cost and availability of funds through adjusting the availability of central bank reserves. Second, when short-term money markets are important source of financing loans for the financial intermediaries, central banks may influence the amount of available funds (such as repos) and the ability of banks to expand their balance sheets. Finally, since interest rates affected asset prices, expansionary monetary policy may enlarge balance sheets of financial institutions through increasing the prices of assets held by them. In doing so, it can relieve balance sheets of financial intermediaries in extending new credits and financing their loans since it allows much more collateral value against borrowing.

### **3.2.2. A case for that monetary policy caused housing bubble**

Taylor (2007, 2009) hinges on the interest rate channel assumptions and maintains that low interest rates help foster the surge in housing demand making the housing finance cheap through especially variable-rate mortgages. Secondly, he argues that this surge in demand exacerbated the pace of housing price inflation, which had already been high since the mid-1990s. Thirdly, this price inflation gave

---

<sup>95</sup> Theoretical presentation here draws on Cömert (2013) and Özatay (2011b).

feedback effect to housing demand. Also, for Taylor (2007, 2009), since delinquency and foreclosure rates on subprime mortgages fell with rising housing prices, this further fostered housing demand due to increased credit ratings on these mortgages. Moreover, he argues that low interest rates and excessive risk-taking are interconnected, because given housing price inflation, foreclosure and delinquency rate on subprime mortgages decreased providing optimistic environment to spur reckless underwriting of mortgages, thereby creating the conditions for risk-taking excess. Finally, when the housing price inflation decelerated with the tightening of monetary policy, foreclosure and delinquency rates started to rise, paving the way to the collapse of mortgage markets, according to Taylor (2009).

In order to provide empirical support, Taylor (2007) establishes a model which relates ffr with housing starts. According to his calculations, the basic correlation between housing starts and ffr working with a lag is “highly significant” for the period between 1959 and 2007 (Taylor, 2007: 4). Then, he uses a counterfactual simulation to compare actual housing starts under actual monetary policy path with what would have happened to housing starts had the monetary policy followed the original Taylor rule for the period preceding the crisis. After that, he repeats the simulation by placing housing price inflation to his housing starts equation.<sup>96</sup> He concludes that even though these simulations cannot anticipate the sharp and abrupt decline at the end of the housing boom-bust cycle of 2002-07, a possible tightened path of ffr “would have avoided much of the housing boom” (Taylor, 2007:6) (see Figure 3.2).

---

<sup>96</sup> Taylor (2007:6) notes that “[i]n fact, there is a close interactive relation between housing price inflation and housing construction (technically, two-way Granger causality).”

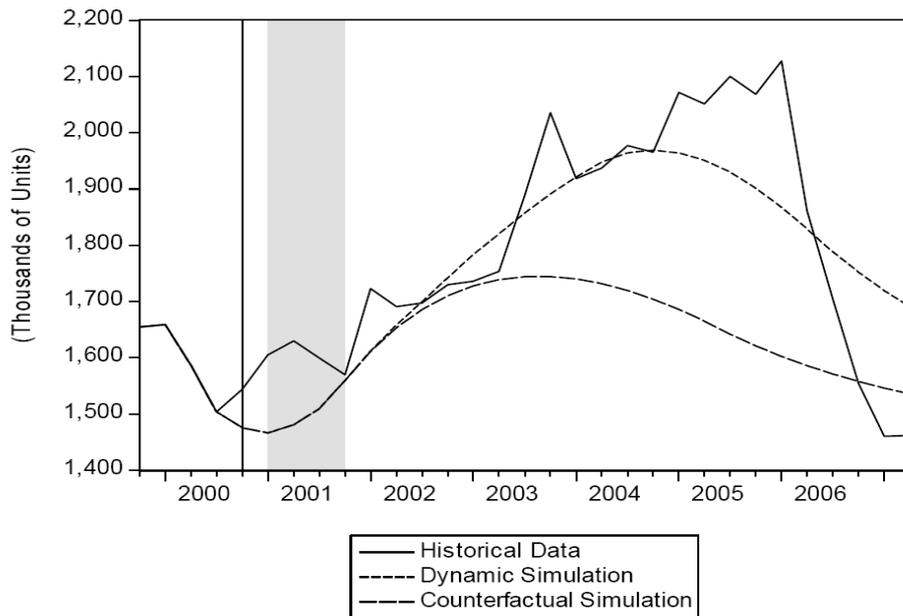


Figure 3.2 John Taylor’s simulations on the effect of different monetary policy stances on housing starts

Source: Taylor (2007: 7)

To reinforce these empirical findings, Taylor (2007) cites historical decline in the volatility of housing investment after the 1970s, attributing it to the efficient monetary policy of the so-called “Great Moderation” era. He juxtaposes standard deviations of housing investment before and after the 1980s and finds that these deviations fell from 13 percent to 5 percent relative to the trends of those years (Taylor, 2007:1). Reminding Taylor’s emphasis on the “deviations” of monetary policy from “the rule” during 2002-2006 periods, this provides an indirect support for linking unprecedented boom in housing sector to the deviations in monetary policy for the recent period.

To sum up, Taylor’s analysis on the role of monetary policy bases on the first and second channels that are described above. Although he mentions about the role of amplifiers, such as subprime mortgage originations, securitization of mortgages, the use of ARMs and the political pressures on Government Sponsored Enterprises (GSEs), his arguments fundamentally draws on the direct effects of ffr and further

effects of housing price appreciation on housing demand. Therefore, presumptively, Taylor uses the user cost of capital framework. His arguments imply that ffr had an effect on long-term interest rates or variable-rate mortgage rates, so they increased housing demand. Furthermore, even though he does not specify the conditions such as supply restrictions on housing under which housing prices appreciated with increasing demand, he hinges on presumptively that housing price appreciation increases housing demand. Also, in his empirical study, he does not specify any transmission channel, but only investigates direct correlation between ffr and housing starts or housing price inflation.

### **3.2.3. Discussions on the effects of monetary policy over long term interest rates and housing bubble**

From a theoretical point of view, Taylor's arguments face a challenge within the interest rate channel framework of monetary transmission mechanism. Firstly, what does matter for the housing markets were long term interest rates rather than short-term rates (Greenspan, 2009). The neoclassical framework of monetary transmission mechanism considers the long term interest rates as the only factor on housing demand; and even in the presence of variable-rate mortgages, long-term rate determines the user cost of capital, thereby housing demand, because expectations on the average variable short-term rate is embodied in it (Mishkin, 2007:18). Also, according to Greenspan (2009), since "the prices of long-lived assets have always been determined by discounting the flow of income (or imputed services) by interest rates of the same maturities as the life of the asset", the path of long term interest rates is relevant for housing sector rather than ffr. Besides, Mishkin and Eakins (2012: 325-6) states that the interest rate on the mortgage is determined by current long-term interest rates, the maturity of the loan and the number of discount points, providing a telling figure which shows that "mortgage rates tend to stay above the less risky Treasury bonds most of the time but tend to track along with them" (see Figure 3.3).

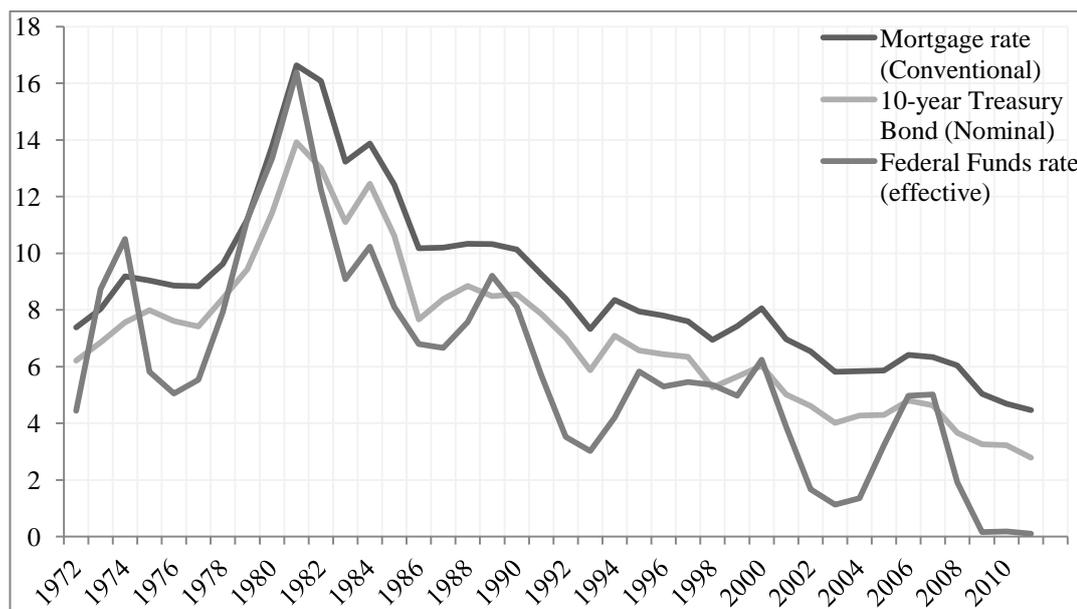


Figure 3.3 Paths of ffr, 10-year Mortgage rate and Treasury Bonds rate (1972-2011)  
Source: The Federal Reserve.

In order to show which rates have been effective on housing prices for the recent period, Greenspan (2010a: 236) provides simple correlation analyses for the housing prices and both types of interest rates. In doing so, he finds that for 2002 and 2005, monthly fixed-rate mortgage rate was followed by housing prices 11 months later with an adjusted  $R^2$  of 0.5 and a t-statistic of -6.93, whereas the ffr was followed by housing prices 8 month later with an adjusted  $R^2$  of 0.205 and a t-statistic of -3.62. Also, regression of home prices on both two variables yields an insignificant t-statistic for the ffr, in this study. Thus, Greenspan (2009, 2010a) concludes that long-term interest rates are relevant indicators for the housing boom for the recent period.

In addition, Greenspan (2009, 2010a) emphasizes on the historical rupture between long term interest rates and short term interest rates at the turn of millennium. Even though, the correlation between ffr and fixed-rate mortgage loans was 0.86 from 1983 to 2002<sup>97</sup>, it declined to an insignificant level 0.1 between 2002

<sup>97</sup> Indeed, Greenspan (2010a:236) alludes that such historical correlations may have misled to the perception that the ffr is “a leading indicator of many statistics that in fact are driven by longer-term interest rates.”

and 2005 (Greenspan 2010a: 236-7). Consequently, these findings imply that housing prices followed the long-term interest rates rather than ffr; and even though there had been close relationship between fixed-rate mortgage rate and ffr, they have been delinked from each other during the 2000s. Thereby, the Fed has little, if any, to do with housing boom, relying on these findings.

However, Taylor (2007) was well aware of the problem of the decline of long term interest rates and their disconnection from the US monetary policy. He says that “[a] complicating factor in reviewing this period is that long term interest rates did not increase as much when the federal funds rate rose as would be expected from past experience during the “Great Moderation”, adding that “[a] larger increase in long term rates would clearly have mitigated the housing boom even with the actual path of the funds rate” (Taylor, 2007:7). However, in contrast to the view of Greenspan (2009, 2010a), who states that the disconnection of long-term rates from the ffr at the turn of millennium was originated from the emergence of well-arbitrated global market for long-term instruments, Taylor points out the monetary policy again: irresponsiveness of long-term rates to ffr was “a direct consequence of the large deviation from the typical short-run interest rate responses” (Taylor, 2007:8). According to him, the large deviation of ffr from the historical path during the 2003-2005 periods changed the expectations of investors about the responsiveness of monetary policy to the inflation. Since this change in expectations (towards lower short term interest rates for the future) would possibly be accompanied by lowering long term interest rates, when the Fed returned to “normal” level, it might have created a disconnection between short and long term interest rates. For Taylor (2007: 8), the recent downward shift in the responsiveness of monetary policy to the inflation resembles the situation of the late 1960s and 1970s, so the Fed policy changed the expectations, in the end, causing the reduced response of long term interest rates.

However, Taylor’s arguments do not answer directly to the question of why ffr and long rates disconnected exactly at the starting of 2000s. This rupture can be seen in Figure 3.3. Even, according to Obstfeld and Rogoff (2009), this downturn in long-

term interest rates started just before the outbreak of the dot-com crisis and the responding monetary policy easing. Also, the Fed used “forward guidance” to inform the markets about prospective target interest rate changes (Bernanke, 2010a). This means that there was a time to revise expectations for investors and this weakens the expectations-based arguments of Taylor over the disconnection of short and long rates.

Nevertheless, Bernanke (2010a) quests for whether there was any contribution from monetary policy to the accelerated housing price inflation before the crisis, since the timing of housing prices acceleration after the 2000s stands out. Establishing a model based on the historical relationship between some key macroeconomic variables, housing prices and ffr from 1977 to 2002, he forecasts the bands within which housing prices and ffr take place for the period from 2002 to 2007. While ffr fits well in the forecasted band, housing prices follows a path outside the forecasted band. Thus, he concludes that “when historical relationships are taken into account, it is difficult to ascribe the house price bubble either to monetary policy or to the broader macroeconomic environment (Bernanke, 2010a: 14). However, it should be cautious about this exercise of Bernanke, because during the process of housing bubble, the movement of housing prices may seem ruptured from any macroeconomic variable or so-called “fundamentals” that could explain housing prices in “normal” times.

Besides, both sides of this debate carry out their research within the interest rate channel framework, but without any certain specification of their models on the transmission channels (Cömert, 2013). With the use of housing prices or housing demand as dependent variables instead of mortgage rates, both sides overlook direct mechanisms, which were implied by interest-rate channel (Cömert, 2013). Since the interest rate channel implies that the direction of mechanism was from ffr to mortgage rates, thereby to housing demand and finally to housing prices under supply-constraints condition, or from ffr to expected market interest rates that induces housing prices; any investigation on the contribution of the Fed’s monetary policy stance to the housing boom should start with these major direct channels.

Also, since there are other channels, which may have influence on housing boom, such as balance-sheet, credit channels, these findings are insufficient to draw conclusions. With easy monetary policy, financial intermediaries may have been relieved (with regard to funding constraints) to expand their balance sheet through increasing available mortgage credits or holding more mortgage-backed securities (MBSs). Also, homeowners may have been relaxed to borrow against their increasing collateral and to increase the size of mortgages they could afford with their increasing cash flows under easy monetary conditions that affect short-term interest rates. Yet, as mentioned above, the correlation between long-term mortgage rates and ffr has declined to insignificant level after 2002 (Greenspan, 2010a). Besides, Cömert (2012, 2013), regressing several most important long-term interest rates –including mortgage rate- on ffr, with or without control variables, finds that declining responsiveness of long-term interest rates to ffr dates back to the beginning of the 1990s, at least, and it has gradually proceeded reaching at peak during the 2000s (mostly giving insignificant or significant but economically meaningless results). Therefore, all these cast doubt on the influence of ffr on housing demand through only interest-rate channel.

#### **3.2.4. Is there any role for adjustable-rate mortgages on the US housing boom?**

Since the post-2000s period was characterized by the upsurge in the adjustable-rate mortgage (ARM) origination, some argues that ffr path had much more influence on ARMs relative to long-term rates, thereby caused or helped housing bubble<sup>98</sup>. The figure below, which is copied from Moench, Vikery and Aragon (2010) (see Figure 3.4), shows that the share of ARMs reached approximately a half of all mortgage originations in 2004. Also, the interest rate on ARMs shows much more similar movements to that of ffr (see Figure 3.5). The spread between fixed-rate and adjustable rate mortgages reflects a premium by which lenders avoid from interest-rate risks associated with fixed rate mortgages (Zywicki, 2009). Therefore,

---

<sup>98</sup> See O'Driscoll (2009) and Zywicki (2009).

noting that this spread hovers around 100-150 basis point in general, Zywicki (2009) points out that it increased from 50 basis point to 230 basis point during the 2000-2004 periods with accompanying increased share of ARMs. Bernanke (2010a) admits that surge in ARM originations casts doubt on the foregoing findings about the role of monetary policy. Thus, looking only at long term mortgage rates is not enough to show there has not anything to do with monetary policy. Drawing conclusions without investigating the potential responsiveness of ARMs to ffr are not sufficient to understand whether there has any role for the monetary policy on the housing boom.



Sources: Federal Home Finance Agency, Monthly Interest Rate Survey; Lender Processing Services.

Notes: Data are monthly and cover the period from December 1989 through April 2010. Mortgage refinancings are excluded.

Figure 3.4 The share of Adjustable-rate Mortgages according to two datasets  
Source: Moench, Vikery and Aragon (2010).

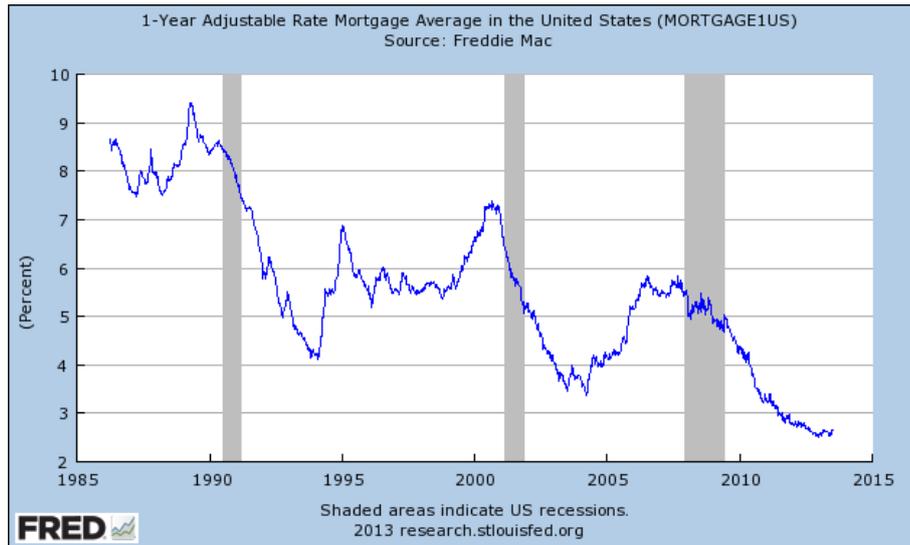


Figure 3.5 The average interest rate on 1-year Adjustable Rate Mortgages in the US  
Source: Federal Reserve Bank of St. Louis.

On the other hand, there are significant counterarguments over the role of monetary policy on ARMs. First, since ARM originations was only at peak just two years before the peak in home prices, it is plausible to think that housing price appreciation and housing boom that have developed since the mid-1990s would maintain even had ARMs not been available between 2001 and 2004 (Greenspan 2008, 2010a). Also, since long term interest rates were low, increased housing demand would not need ARMs to expand bubble (Greenspan, 2008; 2010a). Secondly, Bernanke (2010a:15) states that since ARMs included “amortization of principal and a spread over the index interest rate”, they were not far below the fixed-rate payments, despite very low ffr. Finally, Cömert (2013), investigating the direct correlation between ffr and interest rates of different ARMs, finds that even though the responsiveness of ARMs to ffr is much more than that of long term fixed-rate mortgages, it has nonetheless declined from 1990s to the period between 2002 and 2007.

The other contentious issue about ARMs is whether loose monetary policy contributed to risk-taking excess through proliferation of ARMs. Since the start of upsurge in originations of ARMs coincided with the period of loose monetary policy,

this does not rule out the possible contribution of monetary policy in the rise up of ARM share in total mortgage originations (Obstfeld and Rogoff, 2009)<sup>99</sup>.

On the other side, Bernanke (2010a) argues that more exotic types of ARMs were appealing inasmuch as they provide easiness on initial payments and flexibility about restructuring of payments at earlier stages, not because of low level short-term interest rates. Indeed, contenders from both sides give much more importance to those emerging alternative mortgage products through 2005 and 2006 than the direct interest rate effects on ARMs. While Taylor (2007) attributes this deterioration to the Fed monetary policy in the last instance, Bernanke (2010a: 16, 20) argues that “regulatory and supervisory policies, rather than monetary policies” has to do with it.

All in all, although descriptive statistics and some econometric studies gives much more role on the possible effect of ffr over the rise and appealing of ARMs relative to fixed-rate mortgages after 2003, these findings does not enough to conclude that monetary policy has an important role in the build-up of housing bubble. If the emergence of alternative mortgage products with more appealing and facilitating features is the reason behind the rise in the share of ARMs, then, as Bernanke (2010a) aptly put it, regulatory and supervisory policies should be our concern regarding to the crisis. As we discussed in the previous chapter, financial innovations and regulations were much more related with the indicators of housing boom and the build-up of financial excesses. Therefore, although foregoing findings make a small room for the monetary policy through its effect on ARMs concerning the causes of the crisis, such correlations might have been just mere coincidences or their co-movement might have been resulted from some other factors (Moench, Vikery and Aragon, 2010)<sup>100</sup>. Finally, when we look at the figures above (see Figure 3.4 and Figure 3.5), although, the average interest rate on 1-year adjustable-rate

---

<sup>99</sup> Obstfeld and Rogoff (2009:26) state that “[l]ow nominal short-term U.S. interest rates, and the expectation that rates would rise only at a measured pace, encouraged the proliferation of ARMs. At the same time, low nominal rates and the low-inflation environment, in and of themselves, eased credit constraints.”

<sup>100</sup> See Moench, Vikery and Aragon (2010) for a detailed discussion on this topic, whose findings imply that term structure of Treasury Bonds, relative costs of fixed-rate mortgages and ARMs, and some other supply-side factors account for the changes in the share of ARMs for the recent period.

mortgages in the US have fallen very low levels after the crisis, even relative to the pre-crisis years, the share of ARMs could not recovered and remained at unprecedentedly low levels. This also supports our views which give more emphasis on the possible role of other factors over the rise and fall of ARMs.

### **3.2.5. Does monetary policy explain the global housing boom?**

Since many countries have experienced housing booms before the crisis, Taylor's arguments should be tested for robustness in a global scale. For example, Wolf (2008) puts the emphasis on the non-unique character of the US housing bubble because, by the comparative studies among developed countries, the rank of the US case was not outlier. Also, Greenspan (2008) asks the question "why the remarkably similar housing bubbles that emerged in more than two dozen countries between 2001 and 2006 are not seen to have a common cause."

May loose monetary policy environment in some countries be the common cause? Obstfeld and Rogoff (2009: 28) argues that "[c]ertainly the high level of global liquidity, including the possibly global reach of U.S. monetary ease, contributed to the worldwide upward pressure on housing." Also, Taylor (2009) makes a case for this argument. Firstly, he shows that there existed a correlation between changes in housing investment as a share of GDP and the deviations from the Taylor rule in a sample of some European countries for 2001-2006. This regression gives highly close correlation between housing investment and monetary policy deviations, with  $R^2 = 0.828$  (Taylor, 2009:8). On this basis, Taylor (2009:8) quests for whether there was an interaction among central bank decisions or there was any influence of the US monetary policy on the others' "deviated" short term interest rates. With a regression of the interest rate residuals<sup>101</sup> on the US federal funds rate, he finds the estimated coefficient as 0.21, and which is statistically significant (Taylor, 2009:9). For him, even though this analysis says nothing about the direction of causality, "concerns about the exchange rate, or the influence of the

---

<sup>101</sup> Interest rate residuals are derived by subtracting actual interest rate determined by the ECB from the prescriptions of Taylor rule for each country within the sample of Taylor (2009).

exchange rate on inflation, could generate such a relationship. So could third factors such as changes in the global real interest rate.” (Taylor, 2009:9).

From a different perspective, some argues that the reliance of central banks on inflation targeting regimes contributed to the flow of liquidity that fed into credit growth and financial instability (e.g. Stiglitz, 2009; Biggs and Mayer, 2012). Since there have been majorly other factors that kept prices low –such as China’s deflationary experience, technical progress and globalization-, targeting regimes suggested and justified eased monetary policies that produced flow of cheap liquidity and excessive credit growth (Stiglitz, 2009; Biggs and Mayer, 2012). Besides, although monetary policy stance of the Fed could not affect credit boom in the US, its global reach and effects on the policies of reserve accumulation in developing countries might have contributed to increase in global financial flows, suppression of long-term interest rates and term spreads (Borio and Disyatat, 2011)<sup>102</sup>.

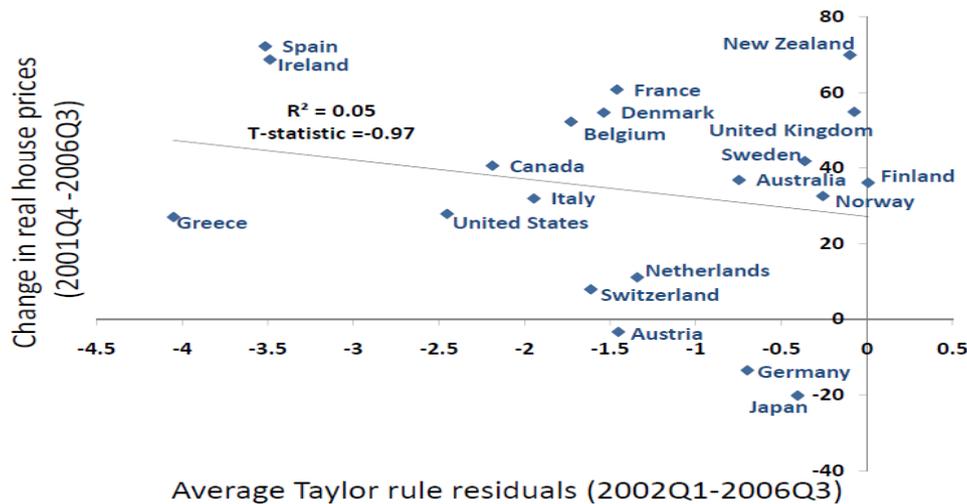
On the other side, Bernanke (2010a) embarks on a quest for the correlation between housing prices and monetary policy for a larger (relative to that of Taylor) sample of advanced countries. Regressing real appreciation of housing prices in the advanced economies on monetary policy deviations from the standard Taylor rule prescriptions for 2001-2006 period, he finds statistically insignificant and economically weak correlation.<sup>103</sup> Yet more, those “11 of the 20 countries in the sample had both tighter monetary policies, relative to standard Taylor-rule prescriptions, and greater house price appreciation than United States” (Bernanke, 2010a:18) (see Figure 3.6). Another important evidence of Bernanke (2010a) was that the US’ experience of housing price boom fell behind the majority of the

---

<sup>102</sup> See chapter 4 for more details.

<sup>103</sup> Note that Bernanke (2010a) takes the housing price appreciation as an independent variable, while Taylor (2009) uses housing investment. Also, their samples were different. In addition, Bernanke (2010a) heavily criticizes the use of the deviations from Taylor rule as an explanatory variable for European countries, even though he does the same. As follows, “holding constant the interest rate set by the European Central Bank, the Taylor rule will tend to impute easier monetary policies to countries with strong economies. Of course, all else equal, a strong economy, even if its strength is unrelated to monetary policy, should experience more robust house prices. Consequently, the relationship ... could potentially overstate the causal relationship between monetary policy and house price appreciation” (Bernanke, 2010a: 17-8).

countries in the sample. Thus, these empirical findings support the view that there should be other factors to explain housing price bubble across countries<sup>104</sup>.



Source: International Monetary Fund.

Figure 3.6 Monetary Policy and Housing Prices in Advanced Countries

Source: Bernanke (2010a).

One of the most remarkable regularity in different researches is the role of current account deficits or international capital flows over the housing boom across the globe. Bernanke (2010a), investigating the role of capital inflows over cross-country differences in housing price appreciation within the same sample as mentioned above, finds statistically and economically significant correlation between housing price appreciation and changes in current accounts (so, the change in net flows) (see Figure 2.7). Also, Cömert (2013), analyzing the explanatory variables of mortgage rates in the US with a multiple regression, finds that capital inflows were much more influential on the long-term interest rates and mortgage rates, especially after 2002. Moreover, since loose monetary policy may reduce capital inflows, if the

<sup>104</sup> See also Merrouche and Nier (2010) for a study that takes several other independent variables alongside housing prices and finds an insignificant role for monetary policy. (A detailed description of the findings of this study can be found in chapter 4).

correlation between capital flows and housing price appreciation is high, then this provide further support to the critics of Taylor (Bernanke, 2010a:19). Finally, Obstfeld and Rogoff (2009: 28-9) point out the correlation between current account deficits and housing price appreciation among different countries, adding that this relationship is “likely reflects two-way causality. Housing appreciation fuels increased borrowing from abroad in several ways, whereas increased availability of foreign funds could ease domestic borrowing terms and encourage housing appreciation.” Finally, even though these analyses does not say anything about the causality between capital flows and housing boom; some of these critics get closer to the view that changing global patterns of current accounts had significant role on the housing boom. We will discuss these findings in the next chapter elaborately.

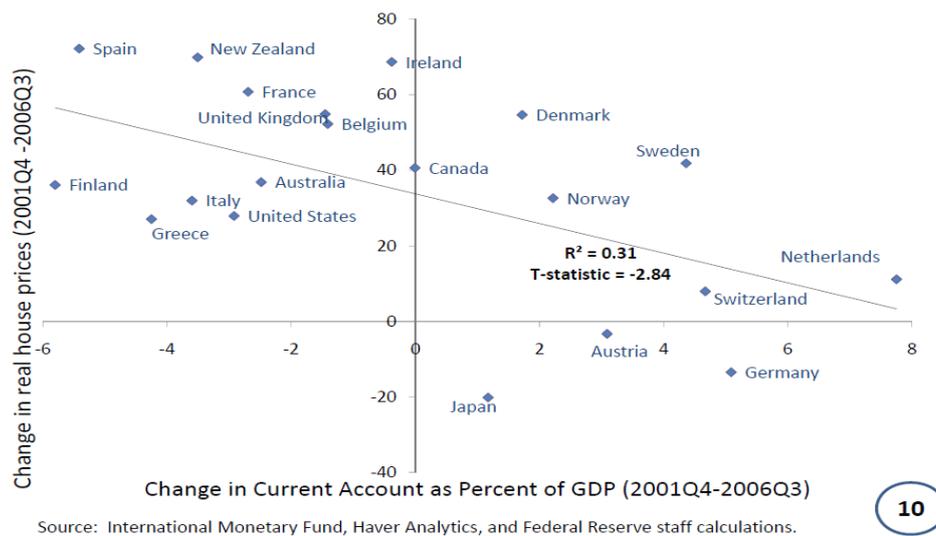


Figure 3.7 Current Accounts and Housing Prices in Advanced Countries

Source: Bernanke (2010a).

Recapping, the first criticism on Taylor draws attention to the determinacy of long term interest rates over housing price appreciation for the recent period. That said, criticisms here point out the need for common factors to explain similar housing bubbles across the globe and indicate widening of current account deficits as

a possible source. These two critics are interconnected with each other on the grounds that deterioration in current accounts, so increases in net capital inflows was associated with the downturn of long-term interest rates. Thus, some critics of Taylor link global current account imbalances to the recent crisis and argue that these lowered long term interest rates were “the most likely major cause” of global housing bubble (e.g. Greenspan, 2008, 2009; Wolf, 2008; Bernanke, 2010a). In fact, as we will discuss and argue in the fourth chapter, these interpretations also very problematic considering their theoretical problems about the determination of long term interest rates. Nonetheless, many empirical findings point out a strong correlation between housing boom and net capital flows. Therefore, instead of monetary policy stances of different central banks, net capital flows might be a good starting point while analyzing housing booms across countries.

Yet, studies that are covered in this thesis do not provide robust and persuasive evidences on the role of monetary policy over housing booms across countries. Although Taylor (2009) finds a correlation between loose monetary policy and housing boom across a small sample of advanced countries, similar econometric analysis of Bernanke (2010a) gives the opposite results for a larger sample.

### **3.3. Could the Fed prevent the Housing Bubble?**

The overconfidence of policymakers in “improvements” about policymaking or managing business cycles, so their “recklessness” about emerging housing bubble became one of the most widely mentioned points with regard to the possible contribution of the Fed to the outbreak of crisis<sup>105</sup>. There are three main contentious points about how monetary policy should react to asset bubbles: the first one is the question about identifying the existence of a bubble; the second one is about the capability of central bankers and central bank tools to prick it; and thirdly, the relative cost of pricking or waiting for its burst on its own motion.

---

<sup>105</sup> See Krugman (2009), Stiglitz (2009), Reinhart and Rogoff (2009). Also there are milder critics on this matter. For example, Wolf (2008) argued that even though he believes that central banks cannot stop an inflating bubble, at least, they could “lean against the wind” during the emergence of bubble through tighter monetary policy.

Firstly, the Fed policymakers were blamed for their belief that identifying a bubble was impossible until its blast or that it cannot be reliably identified<sup>106</sup>. This identification question is mostly related with mainstream economic theory about asset prices and definitions. In a mainstream textbook, a bubble is defined as “a situation in which the price of an asset differs from its fundamental market value” (Mishkin and Eakins, 2012: 130). Generally, asset prices are considered as if they are determined by their underlying fundamentals that include current and future cash flows and discount rates. Thus, an asset price movement beyond the determination of its fundamentals is considered as having a non-fundamental bubble component. Accordingly, some other factors, such as speculative or “irrational”, euphoric behavior of investors, which cause persistent (rather than temporary) deviations in asset prices are considered as the sources of bubbles. This definition poses a challenge that since the fundamental value of an asset is most likely to be obscured due to uncertainties about future cash flows, how can be possible to identify a bubble, and so how can be sure on the existence of a bubble (Bernanke, 2002; Özatay, 2011a:63). Moreover, Bernanke (2002) argues that “to declare that a bubble exists, the Fed must not only be able to accurately estimate the unobservable fundamentals underlying equity valuations, it must have confidence that it can do so better than the financial professionals whose collective information is reflected in asset-market prices”. This implies that when central banks are able to identify bubble in the case of stock market bubbles, since market participants will also identify it, the bubble will be unlikely to develop because open information for every market participants will hamper arbitrage opportunities and so the development of bubble (Mishkin, 2008; Mishkin and Eakins, 2012).

On the other hand, critics argue that there were remarkable indicators before the recent crisis on the existence of a bubble and vulnerabilities. Within the sample of salient indicators which deserves attention as the signal of a crisis, critics count dramatic increases in asset prices, growing current account deficit and increasing debt accumulation, heavy dependence of economy on real estate markets, rapid

---

<sup>106</sup> See e.g. Bernanke (2002).

expansion of credits, blooming of financial innovation, disclosure of predatory lending practices and so on (Reinhart and Rogoff, 2009; Stiglitz 2009).

However, considering the debate over the existence of a bubble, the proponents of the policymaker view argue that using possible alternative measures instead of estimating fundamentals cannot be reliable (e.g. Bernanke, 2002; Mishkin, 2008). For example, Bernanke (2002) states sustained rise in asset prices cannot be shown as an evidence of a hazardous bubble, because either they might have been supported by fundamentals initially or it is not necessary that they will burst with dramatic consequences on financial system and overall economy. Similarly, Mishkin (2008) draws attention to the necessity of making separation between bubbles which might create mild problems and bubbles which might end up with devastating consequences. His conclusion is that asset price bubbles with accompanying credit booms involve greater challenges and greater possibility of financial instability when they burst<sup>107</sup>. Moreover, these defenders of the “identification problem” admit that the existence of a credit boom with rapid appreciation in asset prices may be seen as an indicator of a bubble to some extent (Bernanke, 2002; Mishkin, 2008).

Secondly, whether there was any tool of the Fed to prick a bubble or how much the use of monetary policy tools will be efficient in pricking bubble is another contentious issue. On this issue, policymaker view suggests that monetary policy should react to asset bubbles only to the extent that they affect the expected inflation and output (or employment) by adjusting the policy rate in order to achieve maximum employment and price stability. A corollary of this argument is that monetary should not deviate from its policy rule, which reacts only to the changes in expected inflation and output, and should not try to attempt to prick the bubble by implementing an additional adjustment as setting the policy rate (e.g. Mishkin, 2008). This argument is supported by some evidences in favor of the superiority of the inflation-targeting approach. We will provide an example here, which comes from Bernanke and Gertler (2001). Considering a simple policy rule that reacts to

---

<sup>107</sup> The reasoning behind this argument is the emergence of feedback loop between credit boom and asset price increases (see Chapter 2).

output gap, expected inflation and stock prices, Bernanke and Gertler (2001) compare the performances of alternative policy rules (obtained by assigning different parameters to foregoing variables) under the condition of stochastic economic shocks. They find that for all types of shocks they considered, an aggressive inflation-targeting rule (which assigns 2 or 3 to the parameter of reaction against the changes in expected inflation) stabilizes output and inflation and there is no significant additional benefit of responding to asset prices under this condition. Thus, Bernanke and Gertler (2001: 256) conclude that “for plausible parameter values the central bank should not respond to asset prices”.

On the other hand, the policymaker view is criticized on the ground that other analytical researches that choose the parameters in the reaction function optimally instead of assigning them in an ad hoc way assert the opposite result (Roubini, 2006). Summarizing the debate over analytical models, Roubini (2006: 91) argues that the literature proposes that asset prices should enter into the optimal reaction function and “[m]onetary policy should ‘lean against the wind’, being tighter than a standard Taylor rule would suggest when a bubble is rising and being looser than a Taylor rule would suggest when a bubble is bursting.” Moreover, these results imply an important corollary: since asset prices should be included in the reaction function, the optimal policy will react to asset prices even under the case of uncertainty about the existence of a bubble, thus, this nullify the debate over the identification problem (Roubini, 2006)<sup>108</sup>.

Another contentious issue is about how much monetary would be efficient in pricking a bubble. In general, the proponents of the policymaker view argue that monetary policy is a “blunt tool” to affect the prices of some certain assets and it could not be effective in dealing with a bubble without having affected the economy detrimentally (Bernanke, 2010b, Mishkin, 2008). In addition, the policymaker view,

---

<sup>108</sup> “It is of course correct that the greater the uncertainty about the realizations of a particular variable, as measured by its variance, the less the optimal policy will react to that variable ... But this coefficient will never be equal to zero even in the presence of uncertainty ... While greater uncertainty over the size of asset bubbles would imply a more muted response, a ‘no response’ policy is neither optimal nor rational” (Roubini, 2006: 93).

more or less commonly, suggests that “a smooth response is not well supported by either theoretical or empirical research on asset price dynamics” (Bernanke, 2002), since investors expect very high returns from rising asset prices during a bubble and so a moderate increase in the policy rate would not be enough to prick a bubble (Bernanke, 2002; Greenspan, 2004)<sup>109</sup>. These arguments are followed by that there will be increasing likelihood of devastating economic and financial consequences when central banks aggressively try to respond a bubble. Besides, Mishkin (2008: 68) points out uncertainties about the effectiveness of the policy rate in restraining asset bubbles considering them as abnormal conditions and arguing that “it is unrealistic to expect that the usual tools of monetary policy will be effective in abnormal conditions”. Finally, Bernanke and Gertler (2001) emphasize unpredictable outcomes of monetary policy attempts to prick a bubble over the market psychology. As a result, the Fed policymakers preferred cleaning after the bubble and not leaning against it<sup>110</sup>.

On the counter-side, it is argued that “[b]oth analytical arguments and empirical evidence support the view that bubbles can be carefully affected or pricked without triggering a wide economic contraction or severe financial distress; asset bubbles can be pre-empted in the same way that monetary policy can preemptively deal with inflationary pressures” (Roubini, 2006: 96). Furthermore, Roubini (2006) claims that the UK, Australia and New Zealand monetary authorities became successful in their attempt to prick housing bubbles without generating significant economic and financial problems at the first half of the 2000s. Moreover, against the “blunt tool” argument, Roubini (2006:100) aptly states that, “[i]f this is true, then why should monetary easing, unless it is also excessively aggressive in ways that may also be detrimental, be able to contain the damage of a bursting bubble? Why should the

---

<sup>109</sup> Greenspan (2004) states that “[i]n fact, our experience over the past two decades suggests that a moderate monetary tightening that deflates stock prices without substantial effect on economic activity has often been associated with subsequent *increases* in the level of stock prices.”

<sup>110</sup> Greenspan (2004) states that “[i]nstead of trying to contain a putative bubble by drastic actions with largely unpredictable consequences, we chose, as we noted in our mid-1999 congressional testimony, to focus on policies ‘to mitigate the fallout when it occurs and, hopefully, ease the transition to the next expansion’”.

effects of monetary policy be asymmetric – ineffective in the case of rising bubbles, and very effective in the case of bursting bubbles? There is no economic or analytical logic to this asymmetry”.

What is more, against the argument that proposes ‘not leaning against the wind, but cleaning up after the burst’, critics point out possible severe consequences of this attitude. Stiglitz (2009) argues that allowance for sustaining of a bubble would become much more costly when it breaks, because a larger shock would occur in the end, requiring bankruptcies and large losses of capital. Also, since bubbles developed in a self-reinforcing manner, preemptive interventions to prick bubble can be more useful than waiting for its burst. In addition, many of critics argue that asymmetric approach of the Fed to rising and bursting bubbles might have fed moral hazard disruptions and excessive risk-taking of financial institutions (e.g. Krugman, 2009; Roubini, 2006). Also, since bursting of bubbles systematically leads to aggressive monetary policy easing, this nullifies the argument that many crashes are not costly (Roubini, 2006). Finally, against the arguments that point out uncertainties about outcomes of monetary policy action, it can be pointed out other uncertainties in policymaking process (Roubini, 2006).

As a result, although our debate over whether the Fed could prevent or mitigate the effects of the housing bubble is not enough to derive general conclusions about the question of monetary policy reaction to asset bubbles, considering our previous discussion and results, we can give some interpretations on this question with regard to the recent housing boom. In this context, two points come to the forefront. Firstly, with the support of the evidence on the declining effectiveness of monetary policy stance on long term interest rates, arguing that the Fed could prevent the bubble or mitigate the effects of it is doubtful. Greenspan (2009), pointing out the same point, states that “[g]iven the decoupling of monetary policy from long-term mortgage rates, accelerating the path of monetary tightening that the Fed pursued in 2004-2005 could not have "prevented" the housing bubble.” Although Roubini (2006) has rightful critics, in principle, at many points to the policymaker view, he defends too general view on the efficiency of monetary policy. For example, he states that

“policy-determined short-term interest rates affect both credit conditions and the economic decisions about consumption and investment that, in turn, affect asset prices. Thus, monetary policy can credibly affect the business cycle through its effects on interest rates, credit conditions, investment and consumption” (Roubini, 2006:97). However, it is not certain that monetary policy has always constant capacity to affect the economy. Needless to say, other successful cases of the 2000s do not imply that the Fed could succeed in the same way. Secondly, nevertheless, the general belief of policymakers in the asymmetric response to asset bubbles (“not lean, but clean” view) might have reinforced the excessive risk-taking of financial institutions before the crisis (Roubini, 2006). In this respect, it can be said that the Fed policymakers might have contributed to the build-up of financial excesses.

### **3.4. Conclusion**

Thus far, we have analyzed the argument that links loose monetary policy to housing boom and the recent crisis through interest rate channel. First, this argument criticizes monetary policy stance of the Fed relying on that it was inappropriately loose between 2002 and 2006 according to historical standards. Second, it attempts to show that easy monetary policy of these years sowed the seeds of crisis by accelerating already-rising housing prices through cheapening borrowing in mortgage markets. Besides, some interpretations charge monetary policymakers with recklessness for their attitude towards growing housing bubble and propose that monetary policy should have confronted the bubble with tighter monetary policy; and, in doing so, the severity of the crisis might have been diminished.

However, empirical evidences and our theoretical discussion conflicts with the approach claiming that monetary policy was the main factor behind the crisis. Firstly, there is an inconclusive debate over appropriateness of monetary policy of the Fed during the 2000s, mainly because of the problem about assessing the appropriateness of monetary policy. Since John Taylor’s and many others’ arguments focus on a simple policy rule, i.e. “Taylor rule”, it is fair to criticize the implications of such rules. Also, as Bernanke (2010a) shows, using different

parameters and measures of variables in such a model produces different conclusions. On the other hand, since those who argue that monetary policy was appropriately loose in the given period relies on the prevalent monetary policy benchmarks, their assessment become self-evident. Besides, it may not be fair to say that there was “monetary excess” due to the Fed’s monetary policy stance in the given period. First, the Fed does not control broader monetary aggregates and there are convincing evidences on declining responsiveness of these aggregates to the monetary policy stance because of financial deregulation and financial innovations. Secondly, when historically low levels of the path of ffr is taken as an indicator of “monetary excess”, the question over the effectiveness of ffr on market interest rates still remains, and, as it is discussed in the text, the 2000s witnessed a severe disconnected between them.

On the second point, there are problems in the empirical literature that investigates the link between federal funds rate and housing boom because of the negligence about the specification of monetary transmission channels related with housing sector. Nonetheless, it is mostly referred to interest rate channel implicitly, therefore, the possible effect of monetary policy easing on housing demand and prices through lowering mortgage rates. However, according to econometric analyses that regress both long term and short term adjustable mortgage rates on federal funds rate, the responsiveness of mortgage rates to monetary policy stance diminished gradually especially after the starting of the 2000s (Cömert, 2013; Greenspan, 2010a). The disconnection was effective especially for long term mortgage rates reaching mostly insignificant levels in the 2000s. However, the rising share of adjustable rate mortgages and their ongoing correlation with federal funds rate create a new channel for monetary policy effect on housing boom. Nonetheless, we argue that the rise of ARMs share was not the underlying cause of housing boom and it reflected most probably developments in mortgage boom. Therefore, its overlapping with loose monetary policy environment might be a coincidence, too. Moreover, as we discussed in the previous chapter, mortgage defaults was not only related with ARMs, but they were also related with FRMs, and defaults of both type of mortgages reflected most probably deteriorated underwriting standards in mortgage originations

(Demyanyk and van Hemert, 2008). Finally, in addition to these findings, cross-country econometric analyses about the link between loose monetary policy and housing booms could not display convincing results, too. Hence, we conclude that all of these results cast severe doubt on the influence of monetary policy stance of the Fed on housing demand and housing prices through only interest-rate channel.

However, we are also aware that these findings do not exclude the possible effect of monetary policy through balance sheet, credit channels. This requires being prudent on generalizing the conclusions presented here to a point that monetary policy has no role in the crisis. Nonetheless, when we consider the ever-decreasing responsiveness of the long term interest rates to monetary policy, we may expect that asset prices should have become all the more unresponsive to the monetary policy inasmuch as they are correlated with long-term interest rates. If housing boom affected the prices in financial markets through contributing to their self-expansion, this would also be supportive to our conclusions. What is more, considering a general rise in asset prices during the housing boom, and also the role of financial innovations and deregulations that brought about easier access to credit for households and funding resources for financial institutions, it is likely to expect that some of balance-sheet, credit channels of monetary transmission mechanism may not have worked as it can be expected. For example, securitization might have diminished the ability of central banks to affect funding costs of mortgage originators, thence availability of mortgage loans (Loutskina and Strahan, 2008). On the other hand, it will be not be fair to say that monetary policy has lost all its effectiveness and guidance on financial markets. In fact, there are three possible channels that need to be analyzed carefully to fully understand the role of monetary policy in the crisis. First, the Fed could have contributed to expansion of balance-sheets in financial sector through cheapening available funds in repo markets. Second, the global reach of the Fed monetary policy stance and the responses of other central banks to the consequences of this policy stance might have created new (but very indirect) channel that would possibly contributed to financial excesses<sup>111</sup>.

---

<sup>111</sup> See chapter 4.

Third, some argues that there would have been a link between monetary policy and the perception and pricing of risks by economic agents, through which loose monetary policy environment could enhance excessive risk-taking in financial system (Borio and Zhu, 2008)<sup>112</sup>.

All in all, although our work does not directly analyze the possible effects of monetary policy on housing boom except the interest rate channel, there are good reasons to expect that monetary policy has gradually lost its effectiveness on financial markets, especially on housing-related financial markets through several important channels. Therefore, the accusation of loose monetary policy as the main factor for creating monetary excess and contributing to housing boom may not be fair. Indeed, if our conclusions up to now are correct, it should be asked how the Fed became so ineffective and why it could not foresaw its ineffectiveness and why it would not be preventive on this matter.

Indeed, ineffectiveness of monetary policy during the 2000s was indirectly and moderately admitted after 2005, during the debate over so-called “Greenspan put” (referring to the low level of responsiveness of long rates to tightening federal funds rate). It is widely attributed to growing global imbalances and growing net capital inflows to the US within the community of central bankers (see Chapter 4). However, financial innovations and deregulations were pointed out much less as possible sources by these circles partly because of their belief in self-regulating mechanisms in finance and their support to financial deregulation and innovations. In this respect, we argue that if there is a role for the Fed in the build-up of financial excess before the crisis, it is related to its regulatory and supervisory responsibilities and in three-decades-long process of financial deregulation. Besides the debate over “Greenspan put”, ineffectiveness of the Fed’s measures during the recent crisis can be considered as supportive evidence for the ideas presented here. Nonetheless, since the Fed implemented many nonconventional measures after the crisis, including

---

<sup>112</sup> What is more, as opposed to the other channels that would possibly tended to weaken with financial liberalization, this channel, which is called as “risk-taking channel”, might have been enhanced with financial liberalization, innovations and changes in prudential frameworks, according to the claim of Borio and Zhu (2008).

especially the extension of liquidity provision and protracted asset purchasing programs, the responsiveness of asset prices and long term interest rates might have been rejuvenated.

On the final point, we only provided general views about monetary policy and asset price bubbles. The critical stance against the policymaker view consists of three main components: bubbles can be identified; central banks should respond to asset price bubbles beyond their effect on the variables of monetary policy reaction function; waiting for cleaning after the bubble burst is much more costly than leaning against the bubble while it is expanding. This view has many rightful points. The debate over whether asset prices should be included in the reaction function or not is still inconclusive and it was beyond the scope of this thesis. Nonetheless, relying on other evidences, especially the disconnectedness of the policy rate and long-term interest rates in the 2000s, we argue that the Fed could not have succeeded in preventing the bubble by using its conventional tools. As we have noted above, using non-conventional tools and incorporating asset prices into the reaction function might have created the difference. This argument may seem as overstated but considering the self-reinforcing and evolving housing bubble from the mid-1990s, ever-increasing financial flows between countries, financial deregulations and innovations that empower the capacity of financial institutions in expanding their balance-sheets and making excessive profits at the cost of generating excessive systemic risks, the capability of the Fed in affecting asset prices and preventing bubbles might have been severely diminished.

## CHAPTER 4

### GLOBAL IMBALANCES AND THE CRISIS

“Global imbalances”, as a concept, refers to growing current account surpluses for one side of the world economy and growing deficits for the other side<sup>113</sup>. Unleashing of recent global imbalances dated back to the mid-1990s and it became of concern during the preceding years of the crisis due to the possibility of “hard landing” or “disorderly adjustment” that they could bring about<sup>114</sup>. For the last period, roughly, East Asian countries, especially China, oil-exporting countries and some industrial countries, such as Germany and Japan, have been on the surplus side, while many industrial countries and especially the US which is shining amongst others have been on the growing deficit side (see Figure 4.1 and Figure 4.2). The interesting part of the recent development was the change in the direction of net international capital flows. They started to flow unfamiliarly from developing world towards industrial world, in contrast to the implications of conventional theories.

---

<sup>113</sup> According to a simple index of global imbalances formed by Caroline Freund (2010:11), as “the sum of the absolute values of real trade balances across countries” from 1970 to 2007, growth rate of global imbalances became 11 percent annually on average from 1990 until 2007, while it was 1 percent from 1970 to 1990. By comparison, during the whole period, global trade grew steadily about 6 percent a year.

<sup>114</sup> Roubini and Setser (2005), Bernanke (2005), respectively.

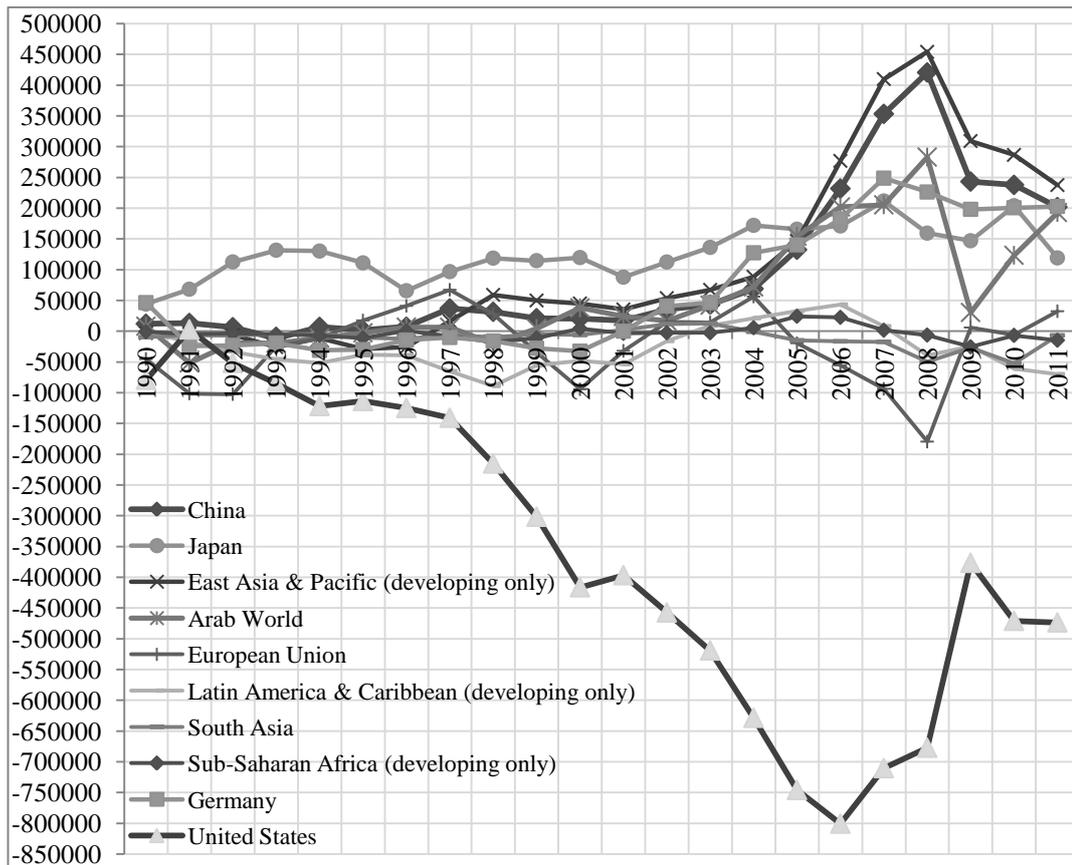


Figure 4.1 Current Account Balances of Country Groups and Selected Countries, in millions \$US, 1990-2011

Source: The World Bank Database.

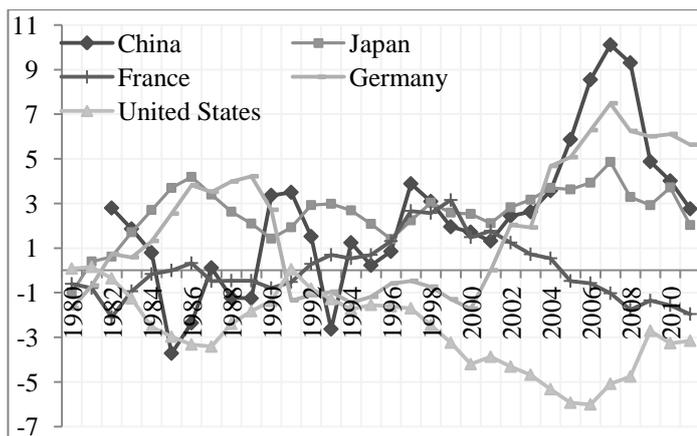


Figure 4.2 Current Account Balances of Selected Countries, as a percentage of GDP, 1980-2011

Source: The World Bank Database.

Global imbalances and increasing net capital inflows to the US are pointed out among the underlying causes of the recent global crisis by some economists<sup>115</sup>. Also, several empirical studies provide supportive evidence on the link between net capital flows and low interest rate environment in the US, and on the link between net capital flows and proximate causes of the crisis (housing boom, financial excesses)<sup>116</sup>. The most common framework to analyze the causes of global imbalances was “saving-investment framework”. Relying on this framework, “excess savings” in one side of the world (especially in developing countries) are pointed out as one of the ultimate causes of the crisis. This implies that the global source of the financial vulnerabilities in the US was mainly surplus-running countries. In this chapter, we will analyze these arguments with a special focus on the implications of them on the global sources of the crisis.

We mainly argue that “excess saving view”<sup>117</sup> has problems in explaining international financing patterns and interest rates, so it misinterpret the global sources of the crisis. Besides, although the empirical literature, which does not have to rely on “excess saving framework”, points out several important linkages between global imbalances (net capital inflows to the US) and the crisis, we argue that both global imbalances and the crisis can be a consequence of the financial deregulation process and effective financial innovations. This argument is opposed to those that propose a causality running from global imbalances to the crisis. Moreover, we argue that the outside source of the financial vulnerabilities in the US was predominantly advanced European countries, not developing countries. As a result, although global financial flows between advanced countries might have played an important role in the build-up of financial vulnerabilities, “global imbalances” explanation of the crisis

---

<sup>115</sup> See e.g. Bernanke (2009, 2011), Corden (2011), Greenspan (2010a), King (2010), Obstfeld and Rogoff (2009), Portes (2009) for the most prominent advocates. The role of net capital flows is proposed as a combined factor in plenty of different interpretations.

<sup>116</sup> See Merrouche and Nier (2010) for a literature review on empirical findings and supportive econometric results.

<sup>117</sup> Throughout the chapter, we will use “excess saving view”, “global excess saving view” or “relative excess saving view” synonymously.

may not be proper since it misdirects the reader about the sources of these international financial flows.

This chapter starts with the presentation of some hypotheses that base on saving-investment framework and how they linked allegedly the root causes of global imbalances to the crisis. Secondly, we will theoretically discuss saving-investment framework and we will analyze the implications of this framework on the sources of global financial flows. Thirdly, several empirical findings on different transmission mechanisms of global imbalances to the crisis will be presented and then, possible contribution of the net capital flows to the crisis will be discussed. It will be drawn conclusions in the final part.

#### **4.1. Some hypotheses that base on saving-investment framework and link global imbalances to the crisis**

In this part, we will analyze those hypotheses that base on saving-investment framework and link global imbalances to the crisis. First, fundamental points of famous “global saving glut” (GSG) hypothesis will be provided, since it gives the most comprehensive framework to discuss other contributions<sup>118</sup>. Secondly, some critics over GSG view will be discussed and other contributions to global imbalances discussion will be presented.

##### **4.1.1. Global Saving Glut hypothesis**

“Global saving glut” (GSG) hypothesis mainly aims to explain how global current account imbalances emerged and how this process was related with the downturn in interest rates in the industrial world after 2000 and with asset price escalations (stock and housing prices) in the industrial world after the mid-1990s. The foundations and main arguments of this view were provided by Bernanke (2005, 2007), before the crisis. After the crisis, Bernanke (2009, 2011) claimed that the

---

<sup>118</sup> See Bernanke (2005, 2007). As stated by Reinhart and Rogoff (2009), GSG combines some of the arguments that were proposed by some others who try to explain global imbalances.

recent crisis could not be understood without any reference to global imbalances. Many others also argue that global imbalances have to do with the build-up of crisis-driving factors, such as the decline in long-term interest rates and excessive risk taking in the financial institutions.

“Global savings glut” is defined as “a significant increase in the global supply of saving” (Bernanke, 2005) at first, but then, Bernanke (2007) narrowed the geographical extent, defining GSG as “large increase in the net supply of financial capital [large increase in net desired saving] from sources outside the industrial countries [emerging market and oil-producing countries]”.

First and foremost, GSG view argues that some factors that caused “global saving glut” account for both growing global imbalances (particularly, deficit in the US and surplus in some developing countries, especially East Asian countries and China) and low level of long-term real interest rates in the industrial world (Bernanke, 2005; 2007). Secondly, according to GSG view, all those factors behind “global saving excess” were external to the US economy and they were mostly originated from developing countries in East Asia and oil-exporting countries.

#### **4.1.1.1. Theoretical Framework: Saving and Investment approach**

Bernanke (2005) argues that recent change in current account patterns cannot be ascribed to trade related factors, such as quality or composition of tradable products and trade policies. This cannot account for the magnitude and sharp rise of the US deficit, according to him. Rather, he argues that trade balance is determined by changes in national income levels and relative price movements, which themselves are determined by more fundamental forces (Bernanke, 2005). Hence, alternatively, he adopts saving-investment approach and associated net international capital flows in order to explain changes in current accounts.

This approach can be summarized in the following way<sup>119</sup>. National saving consists of household saving, corporate saving and public saving, either of which is equal to revenues minus expenditures. National investment consists of public and private investment in capital goods (purchasing, replacing and upgrading of machinery, equipment and construction). At first, in a closed economy case, given all relative prices and income level, it is assumed that economic agents determine their saving and investment schedules, which are called as ex ante (desired, intended) saving and ex ante investment. Then, market forces work to reach equilibrium, where realized saving is equal to realized investment and where relative prices, such as equilibrium interest rate (assuming others are given), are determined in the end.

Theoretical framework of saving-investment implies that in the equilibrium (where realized saving is equal to realized investment), saving and investment levels determine the “world” real interest rates, considering the world economy as a closed economy. Changes in world real interest rates is determined by ex ante saving and ex ante investment schedules (which are the desired amounts of saving and investment at given any level of world real interest rates, and other relative prices that affect saving and investment). By this framework, an exogenous shock that increase ex ante investment for any given level of interest rates shifts ex ante investment schedule. In the new equilibrium, interest rate will be higher than its initial level, thereby realized amount of investment and saving, too. This can be shown in Figure 4.3 below, considering the shift of investment schedule from I1 to I2, and the movement of equilibrium from E1 to E2. The very same process applies to reverse shifts and to ex ante saving schedule. Results are summarized below.

---

<sup>119</sup> Several studies use explicitly and implicitly a framework similar to that will be described here. In fact, here we summarize their fundamental points. Bernanke (2005) and Corden (2011) are those that we mostly draw on.

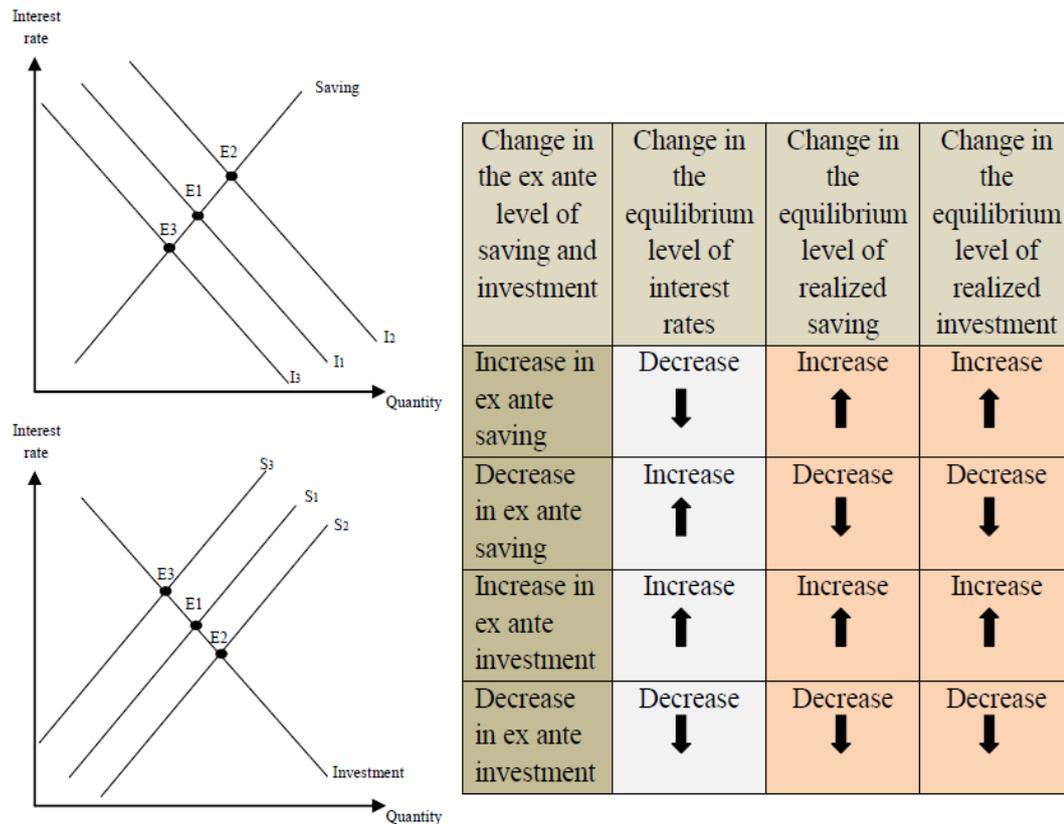


Figure 4.3 Determination of Interest rate and Realized Saving and Realized Investment levels

Source: Author's own schematization.

In an open economy case, this framework implies that realized saving and realized investment in the equilibrium need not to be equal. In fact, realized saving less of realized investment for one country must be equal to its current account balance by national accounting principles. When a country's realized saving exceed its realized investment in a certain period, it runs a current account surplus and this excess saving should have lent in international capital markets. On the other side, deficit-country should have borrowed from international capital markets in order to finance the excess of realized investment over realized saving. This implies that current account deficit will be equal to net capital inflows, and surplus will be equal to net capital outflows for a country. Then, this means that the international equilibrium of current account balances, which is the point that the sum of all

countries' current account balances is zero, will be reached through net international capital flows. As a result, in the end, ex ante saving and ex ante investment levels of each country are the ultimate determinants of current accounts and necessarily net capital flows, because they determine the equilibrium where realized saving and realized investment occurs and the international equilibrium where the sum of all current accounts is zero.

However, ex ante saving, ex ante investment and the natural level of interest rate that they supposedly determined are not observable variables. Nonetheless, Bernanke (2005) states that changes in the patterns of current accounts (thereby realized saving and investment patterns) and observable movements in long-term interest rates of financial market instruments “should provide useful clues about shifts in the global supply of and demand for [ex ante] saving”.

Finally, the changing patterns of current account balances, thereby net funding patterns, across the globe entails simultaneous movements of key relative prices (Bernanke, 2005). In a hypothetical world with two countries, when one country drive its current account to surplus (by shifting either ex ante investment schedule to the left, i.e. decreasing ex ante investment, or ex ante saving schedule to the right, i.e. increasing ex ante saving), key relative prices adjusts so that its counterpart should run deficit. Endogenous changes in terms of trades, long-term interest rates, asset prices -including housing prices- and exchange rates may play the equilibrating role by which transmission occurs (Obstfeld and Rogoff, 2009; Bernanke, 2005). According to conventional theory, when a country runs deficit, so receiving net capital flows, some of the adjustment mechanisms will be at work: currency appreciation, declining interest rate, deterioration in terms of trade, and increase in asset prices. The movements of these relative prices may also become the indicators and triggers of such developments that end up with a bubble and a crisis, as we discuss later.

Recapping, by this framework, first, ex ante saving and ex ante investment determines the level of long-term interest rates through determining a hypothetical “world” interest rate. Secondly, net capital flows are equal to current account

balances, both of which reflect the balance of realized saving less of realized investment, that is itself determined by the changes in ex ante saving and ex ante investment. Third, even though ex ante saving and ex ante investment are unobservable patterns, their movements can be deduced from the changes in realized saving and realized investment levels, thereby changes in current account patterns, and changes in observable long-term real interest rates. Fourth, growing global imbalances are equilibrated by the changes in key relative prices, such as terms of trades, exchange rates, asset prices and interest rates, some of which are seen now as the driving forces of the crisis.

As a result, this framework fits well to one of the main arguments of Bernanke (2005): a “global saving glut” (excess supply of saving, high level of ex ante saving) account for low level of long-term real interest rates in the industrial world. Then, if the ultimate shifters of global ex ante saving and ex ante investment schedules are ascertained, this approach can offer a complete explanation for the underlying causes of growing global imbalances, thereby the recent decline in long-term interest rates and the rise in asset prices, too. In doing so, global imbalances can be linked to the crisis. Indeed, this brought about next two questions: what are the ultimate roots of “global saving glut” that shift ex ante saving and investment levels, according to GSG view? How GSG view explains the recent phenomena of changes in current accounts and the movements in key relative prices that equilibrated current accounts across the globe.

#### **4.1.1.2. What are the ultimate causes of global saving glut?**

First, as shown above, in order to detect the ultimate causes of “global saving glut” (a shift in global saving schedule), Bernanke (2005) takes aggregate changes in current account patterns into consideration for the period between 1996 and 2004. Bernanke (2007) extends the time interval for the developments during 2004-06. The first fact he used to support his argument is that while the US current account deteriorated \$548 billion between 1996 and 2004, current accounts of industrial countries aggregately deteriorated \$441 billion, which implies that “only about \$106

billion was offset by increased surpluses in other industrial countries” (Bernanke, 2005). For the same period, current account of developing countries aggregately improved \$416 billion. Rising surpluses in developing countries of East Asia & Pacific -which is mostly driven by the surplus of China- and in the Arab World can be seen from Figure.4.1. Hence, GSG view concludes that the main responsibility in generating global imbalances fall mostly on developing countries. Finally, Bernanke (2007), extending his analysis into developments of 2004-2006 period, argues that “the fundamental elements of the global saving glut remain in place”.

According to GSG view, the events and factors that drove global saving glut are: first, the consequences of financial crises of the mid-1990s, especially the Asian Crisis (severe drop in investment rates, strong devaluations, precautionary reserve accumulation strategies); second, growth strategies and related economic policies of some developing countries (undervalued currencies, reserve accumulation); third, oil price spikes; fourth, underdeveloped financial system in the emerging market economies and the attractiveness of the US economy as a destination for flowing of excess savings; and finally, structural factors in Japan and EU (aging population and low returns to investment due to high capital-labor ratio) (Bernanke, 2005; 2007). Besides, several events and cyclical developments are incorporated into the analysis to explain the fluctuations in the investment and saving patterns of industrial countries, such as the drop in investment after 2001 recession in the US and the rise in investment during the recovery period.

On the other hand, Bernanke opposes some ideas which claim that growing budget deficit in the US contributed to global current account imbalances<sup>120</sup>. We will discuss the reasons in the next subsection. Finally, Bernanke (2005, 2007) does not give any explanation on the role of monetary policy and home-grown financial

---

<sup>120</sup> See Frankel (2007), Roubini (2008).

imbalances over the growing global imbalances; although some argue that they might have contributed to build-up of global imbalances<sup>121</sup>.

The main argument here is that those factors summarized in five headings have contributed to high ex ante (desired) saving or low level of investment demand in surplus-running countries, especially in East Asia and oil-producing countries. Thus, they generated relative excess saving in these countries and they became the sources of global excess savings, according to GSG hypothesis.

#### **4.1.1.3. How asset prices and interest rates equilibrated global imbalances?**

Theoretically, growing global imbalances are equilibrated by the movements in key relative prices, such as exchange rates, terms of trades, asset prices and long-term interest rates, all of which are, in part, determined by saving and investment movements, according to GSG view. The last two relative prices play significant roles in GSG analysis while explaining low saving rates and current account deficit in the US<sup>122</sup>. In this part, how they equilibrated global imbalances will be discussed by referring to the existing literature. In the end, the movement of these prices also will give an answer to why GSG hypothesis sees the sources of recent global imbalances outside the US.

According to GSG view, as “global saving glut” (or, in general, relatively excess saving over investment) started to emerge in developing countries after the mid-1990s, accompanied capital flows had to flow into somewhere. According to Bernanke (2005), the destination of flows was mainly determined by the attractive properties of the US economy, such as rapid productivity increases (relative to productivity growth in other industrial countries), strong institutions, “depth and

---

<sup>121</sup> Nonetheless, as we have shown, Bernanke (2010a) takes monetary policy into consideration for its direct role on housing bubble and gives several accounts for the problems in the financial markets of the US for the pre-crisis period (e.g. Bernanke, 2009, 2010b).

<sup>122</sup> Also, the movements of the last two has significant place among the causes of the crisis. In ex post evaluations and empirical studies, housing prices and long-term interest rates are seen now as the most important links to the build-up of financial problems and to the outbreak of the crisis

sophistication” of financial markets and by “special international status of the US dollar”. For him, for the first period of widening global imbalances between 1996 and 2000, the key equilibrating role was played by the appreciation of stock prices in the US, alongside the appreciation of dollar. For the second period, after 2001, low real interest rates and housing price appreciation in the US became the prominent transmission mechanisms, even though housing prices started to rise in the US at the mid 1990s.

Firstly, according to the literature, once net capital inflows drove the asset prices upward, then the transmission mechanism works mainly through wealth effect of asset price appreciation and optimistic expectations that they created about future profits. Through the wealth effect, stock price appreciation and housing appreciation drives consumption and results in the decline in household saving. Moreover, when asset prices rise, expectations about future profits lead to the soaring of investment (residential investment in the case of housing appreciation), which, in turn, deteriorate current accounts. Roubini (2008) claims that the common in deficit-countries was the housing boom that led to decline in saving with the wealth effect of housing price appreciation and to the soaring of residential investment, which in turn deteriorate current accounts. Obstfeld and Rogoff (2009:24) argues that housing appreciation was “a major driver of high consumer spending and borrowing” for the US. Similarly, Bernanke (2005) maintains that the wealth effect of housing price appreciation through the cash out refinancing of mortgage loans and home equity loans maintained the national saving rate level low, while, at the same time, the residential investment was growing rapidly.

Secondly, once net capital inflows drove interest rates downward in the receiving country, they equilibrate current accounts through increasing investment and declining saving. For the second period of the recent growing imbalances, the decline of real interest rates in the industrial world drew much attention. Long-term real interest rates started to decline in 2000 for the US after a small rise between 1997 and 2000. Also, very similar patterns were observed in several other industrial countries (see Figure.4.4). Many argues that low mortgage rates driven by declining

interest rates contributed strongly to the record levels of housing investment and housing prices in the US during the 2000s (Bernanke, 2005; Greenspan, 2009; Obstfeld and Rogoff, 2009; Roubini, 2008). Moreover, Bernanke (2005) argues that the decline in interest rates had much influence on the US because of the wide variety of home ownership and well-developed mortgage markets. Therefore, soaring housing prices have shown much wealth effect in the US, driving saving and current account down, according to him. As a result, this channel of adjustment also base on the wealth effect and optimistic expectations about future profits.

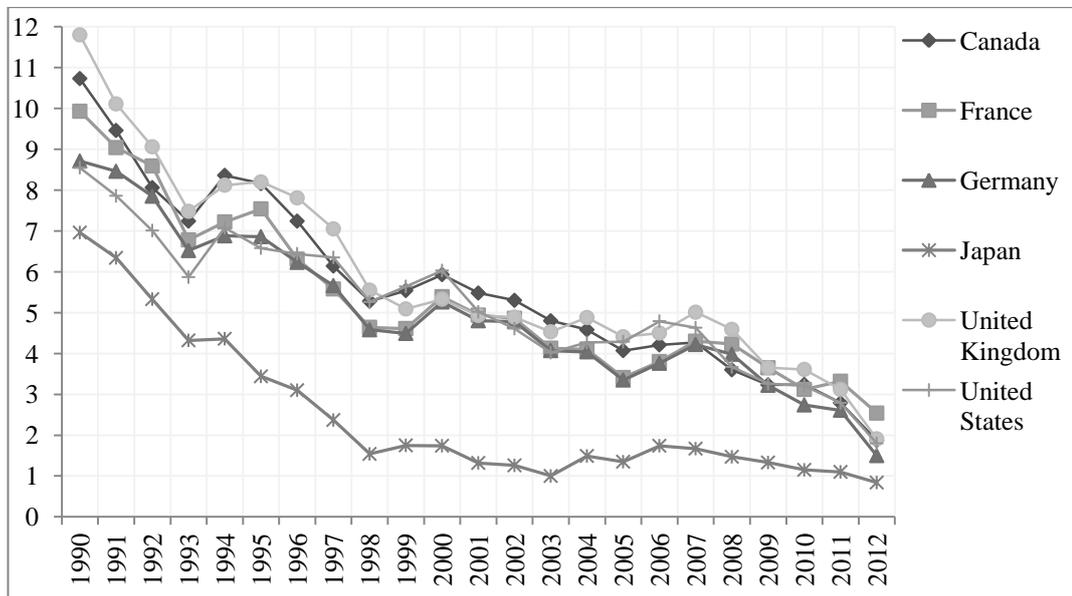


Figure 4.4 Long-Term Interest Rates in Selected Advanced Countries, 1990-2012

Source: OECD database.

Notes: Long term interest rates refer to 10-year Treasury Bonds rates for selected countries.

Finally, GSG view sees the origins of the recent growing global imbalances outside the US. The story starts from the emergence of excess savings over investment outside the US and continues with accompanying changes in the US, i.e. declining saving rates and excess investment over savings in the US. The *rationale*

behind this explanation is the idea of the determination of real interest rates through saving and investment. Bernanke (2007) argues that if the origins of the decline in US saving rate were national factors, this would shift saving schedule to the left (for a given interest rate, the amount of national saving will decline) resulting in a rise in interest rates rather than a decline (see Figure 4.3 above). As a result, according to him, the recent global imbalances were mainly sourced from developing countries that have started to run huge current account surpluses; consequently, the US current account deficit emerged with the equilibrating relative price movements.

#### **4.1.2. Some Critics to Global Saving Glut Hypothesis**

In this subsection, we draw attention to some critics which mainly focus on the stylized facts that seem inconsistent with the implications of GSG view and some developments neglected by GSG view according to critics. We divide these critics and other contributions to global excess saving discussion into three parts: global investment drought view, twin deficit hypothesis, and monetary policy and home-grown financial imbalances. The first critic, in our view, does not downplay the most fundamental arguments of GSG view. However, twin-deficit hypothesis, the argument of that loose monetary policy stance and financial imbalances of the US contributed to global excess saving have some contradictions with general saving-investment framework<sup>123</sup>.

##### **4.1.2.1. “Global Investment Drought”**

One criticism of GSG view draws attention to that if there was a global saving excess that drove “world” interest rate down, this would have resulted in a new equilibrium at which new realized investment rate became higher than its initial position (see Figure 4.3, S1 shifts to S2 and new equilibrium will be E2). However,

---

<sup>123</sup> We do not argue that these hypotheses could not explain global imbalances of the recent era. Indeed, some of them might have been more influential on growing imbalances. However, here, we try to describe the basic patterns and implications of a widespread view, i.e. global excess saving view, in a coherent way. As we mentioned above, Bernanke (2005)’s theoretical propositions and inferences on the link between saving-investment and long-term interest rates do not allow “national factors” to be involved as the active sources of global imbalances.

during the 2000-02 periods, realized investment and realized saving has fallen, according to IMF (2005) data, and could not recover until 2005 (See Figure. 4.5). This fact becomes the source of an alternative explanation for the specific period, 2000-04, which is called global investment drought (GID)<sup>124</sup>. Roubini (2008) argues that GID is more reasonable explanation than GSG for this period. Obstfeld and Rogoff (2009), similarly, posits that the end of high-tech boom of the 1990s at the turn of the millennium and accompanied decline in investment demand, in addition to the sharp decline in investment rates after the Asian crisis, are much more plausible explanations for the decline in interest rates<sup>125</sup>. The justification of this hypothesis is quite similar to that of GSG: the investment schedule shifts to the left (for a given level of interest rates, the amount of investment demand falls), resulting in an equilibrium at which realized saving and investment levels are below the initial levels and the interest rate is lower. Realized saving-investment levels for the 2000-04 periods are supposed to verify it.

---

<sup>124</sup> Roubini (2008) uses the term. See IMF (2005) for an account of investment drought.

<sup>125</sup> Note that Roubini (2008) and Obstfeld and Rogoff (2009) also emphasize on eased monetary policies as the reason of increasing world saving.

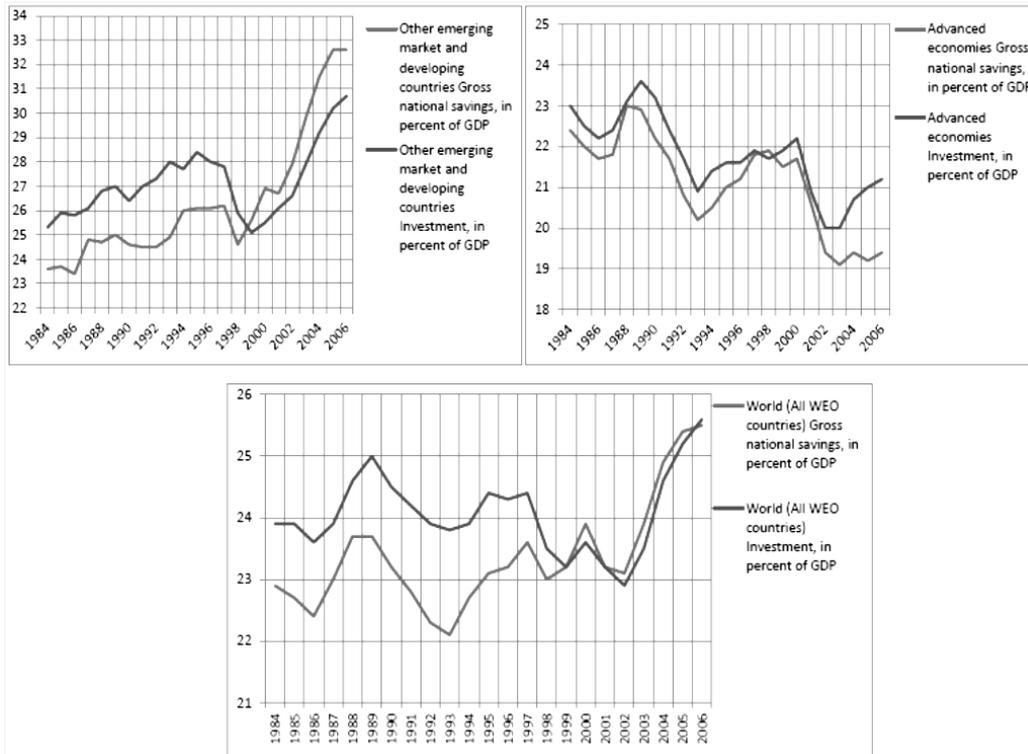


Figure 4.5 Figure.4.5 Gross National Savings and Investment (as percentage of GDP) for Country Groups and the World, 1984 -2006

Source: World Economic Outlook database.

Indeed, GID hypothesis does not strongly downplay the arguments of GSG view. First, even though realized saving-investment equilibrium level was below its previous levels due to a drop in ex ante investment level, this does not downplay the argument that ex ante saving may have risen at the same time. A new equilibrium, in which both the interest rate and realized saving-investment levels are below its initial levels, can be reached when ex ante investment declines and ex ante saving rises, depending on the amount of shifts and the shape of saving schedule. An example of such a situation can be followed by Figure 4.6 below.

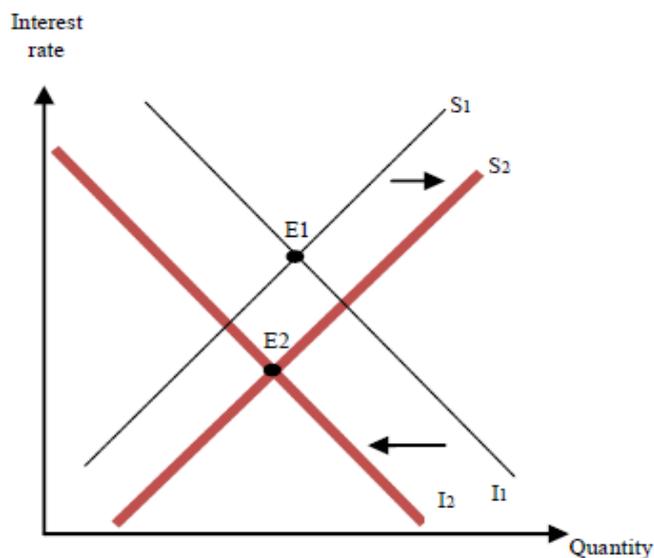


Figure 4.6 An example of saving and investment shifts that result in low interest rate.  
Source: Author's own schematization.

Also, GSG hypothesis points out the decline in investment demand after the Asian crisis and the dot-com crisis<sup>126</sup>. It seems that GSG stress only and especially the *relative* conditions in intended savings and intended investment for the 2000s, even though this is not clear. Moreover, according to the IMF (2005), those declining trends of realized saving and investment mostly reflect the developments in industrial countries since their share in global saving and investment is large (despite a downward trend for decades) (see Figure.4.5 above). The IMF (2005) shows that saving has kept its pace in emerging market economies. Bernanke (2007) defines GSG more clearly as the large increase in the supply of funds from emerging market economies and oil-exporters, which overlaps with the facts of the 2000s. Hence, considering all these changes in variables, such equilibrium, as described in Figure 4.6, might have been reached.

<sup>126</sup> See especially, Bernanke (2005). He argues that new capital investment demand was depressed with the outbreak of the dot-com crisis whereas the desired saving maintained its level, so the long term interest rates had to decline. Also, Greenspan (2010a) argues that whatever the fact was, global saving glut or global investment drought, it necessitated the fall of real long-term interest rates and brought about the decline and convergence of equity and real estate capitalization rates across the globe.

#### 4.1.2.2. “Twin-Deficit” Hypothesis

Frankel (2007) argues that current account deficit of the US fundamentally reflects the national saving shortfall that arose from mainly deteriorated public saving. Roubini (2008) support the same view for 2000-04 periods, emphasizing the existence of both US private and public saving “drought” even after a recovery period and above potential growth. According to Roubini (2008: 164), the evidence that support this explanation is as follows: while the US run fiscal surplus of 2.5 percent of GDP in 2000, it turned out to deficit of 3.5 percent of GDP in 2004. This 6 percentage point deterioration in national saving rate despite the fall of investment by 4 percentage point for the same period due to the crisis may be an explanation for the 2 percentage point deterioration in current account for the same period. This makes a clear case for the twin deficit hypothesis from 2000 to 2004, according to proponents of this explanation.

On the other side, Bernanke (2005) criticizes the twin deficit hypothesis on the ground that it does not account for the overlapping of improving fiscal balance and deteriorating current account surplus during the 1996-2000s. Also, twin deficit story does not embrace the examples like Germany and Japan where budgets deficits are as large as the US deficit but current accounts have run surplus (Bernanke, 2005). Finally, as discussed above, since it is expected that theoretically budget deficits increase interest rates; twin-deficit hypothesis faces a great challenge within global excess saving explanations. During the 2000-2004 periods, both budget balance and interest rates move in the same direction in contrast to the theoretical implications. In these explanations, the decline of long-term interest rates is attributed mainly to the eased monetary policy of the US (Frankel, 2007; Roubini, 2008). However, as we discussed in the previous chapter, the decline in the responsiveness of long-term interest rates to the Fed rate, especially after the 2000, makes this argument doubtful. Nonetheless, the proponents of twin deficit view do not mean that fiscal and current account balances always move together. They state that fiscal expansion led to both budget deficit and the current account deficit for the recent period (Frankel, 2007:6-7), especially for 2000-2004. Therefore, this argument may indeed be right to argue

that fiscal expansion of the US might have been one of the factors that drive current account into huge deficit. However, the validity of this argument seems weak within the saving-investment framework because of contradictory interest rate movements.

#### **4.1.2.3. The role of other Internal Factors on Global Imbalances: Accommodative Monetary Policy, Housing Bubble and Home-grown financial imbalances in the Industrial World**

GSG view is also criticized for the negligence of two factors in its explanation of global imbalances. First, it is argued that GSG view overlooks the possible contribution of loose monetary policy in the industrial world to global excess savings. According to Obstfeld and Rogoff (2009), easy monetary policy helped excess saving in world economy, thereby contributed to widening of global imbalances. According to Portes (2009), increased global liquidity, with the rapid pace of reserve accumulation in developing countries and with the expansionary monetary policies of the industrial world might have brought about low interest rates in the end. Secondly, it is argued that housing boom and home-grown financial imbalances, such as financial innovations, financial deregulation and excessive risk-taking in the financial system may have contributed to the global imbalances (Obstfeld and Rogoff, 2009). As Obstfeld and Rogoff (2009) emphasize, the correlation between current account deficit and housing boom can be explained by a two-way causality.

Nonetheless, the latter critic about financial imbalances could not be fitted into global excess saving explanation. If these home-grown factors were the ultimate causes of growing global imbalances, they should have driven interest rates upward through declining saving rates in the US (shifting saving schedule to the right). Moreover, the situation is more complicated for monetary policy. Easy monetary policy implies both a decline in long term real interest rates through interest-rate channel and increasing global liquidity, i.e. not shifting any curve, but moving the equilibrium along the curve. On the other side, it can be argued that easy monetary policy may shift saving schedule to the left through increasing asset prices and

increasing the wealth-channel effect, for example, according to saving-investment framework.

Indeed, these arguments differ from the arguments that we discussed in the previous chapters, in some respect, because they imply the global effects of the US' monetary policy and the effects of them on saving and investment schedules. Despite the apparent problems related with chosen saving-investment framework, monetary policy and home-grown financial imbalances might have contributed to the crisis-driving factors when they are assessed within different theoretical frameworks (thereby, conducting empirical research depending on the implications of such frameworks).

#### **4.2. Discussion on the saving-investment framework and its implications on the ultimate determinants of global imbalances**

This section comprises of two main parts. Firstly, we will criticize theoretical framework of saving-investment analysis and we will point out some problems in the interpretations that rely on this framework. Secondly, we will shortly focus on the implications of excess saving view on the ultimate determinants of global imbalances by questioning whether they explain global imbalances and whether they can be linked to the crisis-driving factors directly, without relying on excess saving view.

##### **4.2.1. Discussion on the saving-investment theoretical framework**

The saving-investment approach which is used by many to explain the recent current account imbalances and the patterns of interest rates will be analyzed in this part. Although there is a tiny literature that points out the problems exclusively related with the theoretical framework of global excess saving view, there are plenty of noteworthy ideas in these critics, many of which originated from the works of celebrated economists, such as Keynes, Schumpeter or Wicksell. In this part, we will focus on several aspects of the theoretical framework that excess saving story hinges on with the help of this tiny literature. We should note that we embrace most of these critics, and with the help of them, we will interpret the views and empirical findings

in the subsequent sections. This part starts with the analysis of whether saving-investment framework can explain global financing patterns. Secondly, it questions whether it can explain interest rate movements. Finally, it focuses on some methodological and other problems in the interpretations that rely on this framework.

#### **4.2.1.1. Does saving-investment framework explain the global financing patterns?**

In an influential paper, “Global Imbalances and the financial crisis: Link or no link?”, Claudio Borio and Piti Disyatat (hereafter, BD) argue that “the saving investment framework is inadequate for drawing inferences about global *financing* patterns and explaining the behaviour of *market* interest rates” (Borio and Disyatat, 2011:6). There are significant implications of such a critic. Perhaps most significantly, BD approach implies that global excess saving approach “overestimate[s] and miscast[s] the role of current account imbalances in the crisis” (Borio and Disyatat, 2011: 2)<sup>127</sup>.

First and foremost, BD (2011) argue that by the construction of saving-investment investment analysis, excess saving arguments mainly focus on the net capital flows (net resources flows), but changes in net flows and net financial claims between countries say little about global financing patterns, the bulk of which are purely financial flows, which was at the core of financial fragility. At first, they point out the conceptual confusion between saving and financing. While “saving” is defined as the remaining part of income when consumption is subtracted, and as a national account concept, “financing” is defined as “access to purchasing power in the form of an accepted settlement medium (money), including through borrowing” and as a cash-flow concept (Borio and Disyatat, 2011:1). Based on these definitions, BD argues that investment requires financing and is constrained by the lack of financing opportunities, not saving. As well known, saving and investment are the mirror image of each other in the national accounting. In a closed economy, by

---

<sup>127</sup> This paper directly focuses on the questions of this part and the subsequent one, being an inspiration to these parts. Therefore, in these parts, we will heavily rely on Borio and Disyatat (2011).

construction, saving represents “the contribution that expenditures other than consumption make to income (output)” and since “the only way to save in a given period is to produce something that is not consumed”, they will be equal to each other (Borio and Disyatat, 2011:7). However, according to BD, this does not mean that saving constrict the investment for a given period because “[i]n *ex post* terms, being simply the *outcome* of various forms of expenditure, saving does not represent the constraint on how much agents are able to spend *ex ante*. The true constraint on expenditures is not saving, but *financing*.” (Borio and Disyatat, 2011:7). The intuition can be enhanced considering the case of an economy in which saving and investment is zero but expenditures and production are met by substantial borrowing and lending (Borio and Disyatat, 2011:7). Also, since various degrees of changes in financial assets and liabilities may coincide with various degrees of saving in an economy, and typically, increases in assets and liabilities exceed the volume of saving for a certain period, these show that expenditures can ultimately be financed in many ways without constricted by saving and the changes in financial claims in a certain period bear no relationship with the volume of saving.

Translating this conceptual framework into an open economy case, BD (2011) argue that the distinction between saving and financing in a closed economy case is mirrored in the distinction between net and gross capital flows in an open economy case. At first, they argue that “gross flows need bear little relationship to net flows and hence to the current account” and in turn, “those gross flows themselves capture only a small fraction of transactions among residents and non-residents, all of which require financing” (Borio and Disyatat, 2011:9). Then it simply follows those pure financial transactions, which amount to several times of the amount of gross and net flows, has no relationship with current account patterns. Also, BD’s conceptual distinction implies that “current account says *nothing* about the extent to which domestic investment is financed from abroad”, since a country with balanced current account may finance its whole investment with foreign loans acquiring deposits vis-

à-vis non-residents at the same time<sup>128</sup> (Borio and Disyatat, 2011:9). Moreover, they argue that current account balances does not say anything about global financing patterns and cross-border intermediation, since the conceptual distinction between financing and saving implies that deficit-countries are not need to be financed by surplus-countries<sup>129</sup>. Finally, they argue that the residency principle that national accounts and balance-of-payments statistics are based on conceals the important role of international banking activities in the build-up of financial fragility.

#### **4.2.1.2. Does saving-investment framework explain interest rate movements?**

The discussion over the determination of interest rates and especially the question over whether they are determined by real factors of the economy have a long history and there are plenty of views. For example, both Marxian and Keynesian schools question the determination of interest rates directly by “real forces” from different theoretical backgrounds<sup>130</sup>. Therefore, the existence of a “natural interest rate” determined by global saving and investment balances is a very contentious issue.

In our context, a direct criticism to the implications of the saving-investment framework on interest rates is provided by Borio and Disyatat (2011). They argue that saving and investment determine the “natural interest rate”, an unobservable

---

<sup>128</sup> Putting differently, they say that “[a] balanced current account only implies that domestic production equals domestic spending, not that domestic saving “finances” domestic investment” (Borio and Disyatat, 2011:9-10).

<sup>129</sup> They state in a clear way that “[i]n terms of national income accounting, deficit countries are compensating for the non-consumption of surplus countries. In this sense, current account deficits are matched by saving in other regions. But the underlying consumption and investment expenditures that generate such imbalances may be financed in a myriad of ways, both domestically and externally. And while by exchanging financial claims for goods and services, the deficit country is effectively, on net, “borrowing” from, or drawing down assets on, the rest of the world, the ultimate counterpart of changes in those claims need not be countries running current account surpluses” (Borio and Disyatat, 2011:10).

<sup>130</sup> See chapter 3 in Itoh and Lapavitsas (2012 [1999]) for a Marxist interpretation on the determination interest rates. See chapter 2 in Snowdon and Vane (2005:36-90) for Keynesian difference in the determination of interest rates.

hypothetical rate, where the equilibrium in goods market is reached. However, the market interest rate, they argue, is fundamentally a monetary phenomenon and it is determined by central bank policies, expectations about future rates, risk perceptions and tolerance of investors and affected by supply of financial assets. Indeed, the latter one is one of the basic common views in modern macro-finance literature (e.g. see Mishkin and Eakins, 2012). However, there is no widespread agreement on the former one. Borio and Disyatat (2011) argue that these two concepts, “natural interest rate” and “market interest rate”, could be reconciled by considering that real factors determine the steady state equilibrium level of real interest rate while monetary and financial factors determine actual interest rates at any given time. Thus, it follows that “[t]he influence of the saving-investment balance on market rates” becomes “only *indirect*, through the reaction function of the central bank, market participants’ expectations of what the “right” rate should be and their risk preferences ... If so, the ES [excess saving] view could still be a valid approximation if the market rate moved at least roughly in line with the natural rate over the relevant observation period.” (Borio and Disyatat, 2011:21). Nonetheless, even though it is possible to expect that saving and investment affect market interest indirectly and guide the market rate toward natural interest rate, according to Borio and Disyatat (2011), this was not the case before the crisis. In fact, financial imbalances preceding the crisis (asset prices and credit boom), they argue, display a sign of significant and persistent gap between the two rates. They conclude that “[i]t is hard to imagine that goods markets can be in full equilibrium, and hence growth can be sustainable, in the presence of such credit booms” and “[i]f anything, the subsequent full-blown financial crisis suggests that the unusually rapid credit expansion was a sign that market rates were *below* the natural rate” (Borio and Disyatat, 2011:22).

In the spirit of Keynesian approach to saving and investment balances, there are other important critics, too. Patnaik (2010) reminds that assuming saving and investment as functions exclusively of interest rate belongs to pre-Keynesian economics, which concludes that “Say’s Law would always hold, since the interest rate would always move to equilibrate savings with investment at full employment

output”. In the spirit of Keynesian revolution, which criticizes this view on the ground that a saving curve “could be drawn for every level of income, whence it followed that there was an infinity of such curves ... [and] there was no reason why output would settle at the full employment level”, Patnaik (2010) draws attention to several flaws in the theoretical suggestions of the global excess saving story. Firstly<sup>131</sup>, when the possibility of income adjustment is taken into consideration instead of interest rate adjustment, a rise in the level of ex ante savings for any given level of income and interest rate in developing countries, may reduce aggregate demand, causing a recession and without creating any change in current account positions. If, however, as it is presumed by global excess saving hypothesis, with the rise in the level of ex ante savings of the developing world, income level and relative prices remains unchanged at first, then, this means that other economies will absorb the goods and services offsetting the reduced domestic absorption of the developing world, creating surplus-countries and deficit-countries at the same time. If this is to be happened without changing the level of income in deficit-countries, the level of saving should reduce at the same amount there. However, if this explains how the recent global imbalances emerged and how the adjustment has occurred, then, as aptly put by Patnaik (2010), “it is not obvious why there should be any change either in the exchange rate or in the interest rate anywhere”. Also, since increased savings, so net capital flows from the surplus countries will be exactly corresponded to the demand for them, it is not obvious that those flows will cause pressure on interest rates of the deficit-countries, thereby on the world interest rate. Thus, when the adjustment story of global saving and investment balances is considered with the critical approach of Keynesian tradition, it seems that there is not any obvious reason to suppose an excessive global saving, or a ‘glut’ and its pressure on interest rates.

---

<sup>131</sup> The rest of this paragraph draws on Patnaik (2010).

#### **4.2.1.3. Some methodological problems of the interpretations that rely on saving-investment framework**

Analysis of current account and net capital flows through saving-investment framework depends on the intertemporal approach to current account patterns. According to this approach<sup>132</sup>, a country that run surplus is the net exporter of goods and services and net importer of financial instruments, and *vice versa*. This trade necessitates that countries will change their role in the future –i.e a country that runs deficit now will run surplus in the future. For now, international equilibrium of current account balances of all countries, which sums zero in the equilibrium, reflects the decisions of economic agents in all countries, which aggregated in their countries' saving and investment schedules. In the end, this equilibrium is reached through international capital markets in which interest rates, asset prices and several other key prices play the equilibrating role.

One implication of intertemporal approach is that since developing countries have low capital-to-labor ratios, so their marginal product of capital is high and they “should tend to attract capital from developed countries where labour tends to be relatively scarce” (Legg et. al., 2007: 5). In the end, it is expected that when a developing country becomes gradually mature, the direction of flows change. Indeed, Legg et. al. (2007) draws attention to limited empirical support for this implication of intertemporal approach. This implication of theory is embraced by many interpreters, such as Bernanke (2005), who dubbed the recent phenomenon of capital flows as unnatural. Nonetheless, before the crisis, global imbalances were seen as mostly the outcome of market forces, so dubbed as an equilibrium phenomenon (e.g. Bernanke, 2005; Dooley et. al, 2003; 2004; 2005a; 2005b), although there were economists criticizing this interpretation, too.

Since, the recent global imbalances are seen as unnatural, some other factors were put forward to explain these “anomalies”, such as differences in development of institutions and financial markets, demographic variations, temporary terms of

---

<sup>132</sup> This paragraph draws mostly on Corden (2011), Legg et. al. (2007).

trade shocks (oil price shocks), the consequences of financial crises (e.g. reverse of capital flows, precautionary reserve accumulation) and growth strategies and associated macroeconomic policies (e.g. undervalued currencies). Thus, even though all these factors are considered in order to explain unfamiliar, but ‘benign’ global imbalances at first, some of them, particularly those that are thought as disrupting “the rules of the game”, i.e. disrupting the market forces, are pointed out as the underlying (or deep) causes of the crisis after the crisis erupted<sup>133</sup>.

In fact, the methodological approach that these arguments hinge on is quite flawed in these cases. At first, possible causes of the deviations from and violations of theoretical implications are seen as “anomalies” or casual developments. Then, adding these anomalies into the basic framework, it is concluded that these anomalies explain the violations of original theoretical implications. Nonetheless, since they are seen as the outcomes of market forces at first, it is expected that there would be a milder adjustment in the future. However, when the crisis erupted, most of these anomalies were seen as real anomalies and the root causes of the crisis. As a result, this kind of methodology produce a theory that does not have any explanatory and predicting power, but only has an illustrative or descriptive power, beside its power in enabling pragmatic readings of the past.

Take another example. What the original theory implies is that global imbalances are not malign development unless the rules of the game or market forces are interrupted. In line with this implication of the theory, Max Corden states that “a *particular* global imbalance” contributed to the crisis rather than global imbalances (Corden, 2011:3, emphasis in original). He argues that given global saving glut (excess saving over investment) in East Asia, China, Japan, Germany and oil-exporters, this might not have resulted in the crisis, had capital flows transformed into productive investment opportunities either in the US or in a significant group of countries outside the US. Consequently, Corden (2011) points out global saving glut as the underlying cause, but putting the following next: the “unsound” and “unfruitful” use of capital inflows rather than productive use of them. According to

---

<sup>133</sup> This is what Bernanke (2011) exactly implies.

him, this was the result of such anomalies as use of capital flows through current consumption, “unwise” investment (housing), and warfare expenditures of government in the US; the inadequacy of US financial system in the allocation of resources wisely; and finally, the avoidance of developing countries from capital flows due to their instability (so “the inefficiency of world’s financial sector”) and due to the “false” belief in the harmfulness of real appreciation that they brought about<sup>134</sup>. Indeed, despite the existence of some points we may agree upon, this account clearly directs us the problem of this type of analysis. If excess saving and associated capital flows were transformed into “fruitful” investment opportunities somewhere else, either in the US or outside the US, intertemporal trade would have materialized without any friction, so there would not be any crisis. However, distortions, inefficiencies and false beliefs created frictions in the adjustment of market forces, so they have culminated in the crisis. As a result, based on the belief and confidence on the power of adjustment of market forces, these accounts attribute the crisis to some anomalies that distort the market forces or inefficiencies that impede on the market forces, however, this kind of approach to the crises, in general, has lacks in explaining the systematic and repeating nature of the crisis, whence they could not explain them, but only depicts them according to ideological or political concerns of the era.

Besides, the critics draw attention to some fallacies that the saving-investment framework hinges on. In their detailed analysis, Borio and Disyatat (2011) argue that this framework extends “inferences that are valid for an individual agent to the economy as a whole”, considering the concept of saving. While additional saving is necessarily allocated into financial or real assets from the individuals’ hands, the allocation of additional saving in the aggregate “represents a gross transfer of assets across individuals”, so drawing inference like that additional saving increases financial asset prices will be wrong (Borio and Disyatat, 2011: 8). Secondly, they draw attention to the exclusion of monetary factors and the reliance exclusively on

---

<sup>134</sup> This account has many common points with GSG view, but also has many original and more explicit implications. Indeed, Corden (2011) exactly makes what he says: “[t]he whole of this paper is concerned with making explicit what is often just left implicit.”

real analysis in the saving-investment framework. As it is aptly put by Borio and Disyatat (2011: 8) “[s]ome intermediaries, banks, actually create additional purchasing power in the form of deposits through the act of extending credit”. Also, at the international level, focusing on the analysis of “net capital flows”, i.e. the counterpart of net resource flows, the saving-investment framework passes over the global financial flows, the bulk of which are purely financial transactions, and the effects of these flows on financial markets and indirectly real economy.

Finally, Borio and Disyatat (2011) points out an inconsistency in the global excess saving story. The next two questions are hard to answer by relying on saving-investment framework. Firstly, since global story considers that long-term interest rates were suppressed by fundamental forces (real forces), resulting in equilibrium of global saving and investment schedules, then, how could the forces that create shifts in these schedules be seen as problematic? Secondly, since the world economy is viewed as it was in the equilibrium, thereby since the relative prices (especially interest rates and housing prices) that allegedly equilibrated current account balances are the equilibrium prices, then how could one say that there was a problem with these prices and they created financial excesses and caused the crisis? Thus, the reliance on the concept of “equilibrium” while explaining global imbalances and reliance on the determination of interest rates through saving-investment analysis remain nothing as an explanatory variable for the crisis within the framework of global excess saving view.

#### **4.2.2. Discussion on the Ultimate causes of the Global Imbalances**

Global excess saving view implies that the ultimate causes of the global imbalances, i.e. those factors that shifted saving and investment schedules of the concerned countries, are also the underlying causes of the crisis. According to Bernanke (2005), ultimately, there are five drivers of the recent global imbalances. These are financial crises of the 1990s in developing countries and their consequences, growth strategies and undervalued currencies of developing countries, oil price spike, differences in financial development between developing and

industrial countries, and finally structural changes in some industrial countries. Based on saving-investment framework, these ultimate factors resulted in relatively excess saving over investment, majorly in developing countries, that necessitated net capital outflows towards industrial countries, majorly toward the US economy. Also, it is assumed that these ultimate factors determined the movement of the hypothetical world interest rate. In this subsection, we shortly analyze whether these factors explain global imbalances. Nonetheless, the main question here whether they can be linked to the crisis without embracing saving-investment framework. Therefore, we also examine this possibility in this part. Except the last one, i.e. “structural changes in some industrial countries”, which points out the link between ageing population and current surpluses of Germany and Japan, all the first four factors will be analyzed respectively<sup>135</sup>.

#### **4.2.2.1. Direct Consequences of the Financial Crisis in the Developing World**

Turbulent side of the 1990s witnessed a series of financial crises across the developing world including many Latin American countries in different years, East Asian countries in 1997-98, Russia in 1998, Turkey in 1999 and 2001. Bernanke (2005) attributes a key role to these financial crises for the resulting change in the current account patterns because of both their direct consequences and indirect consequences. Direct consequences of (indeed, many times, the reason for) these crises were the abrupt capital outflows resulting in recessions and the decline in

---

<sup>135</sup> One reason for this exclusion is that this factor is considered as secondary even by the most prominent defenders of excess saving story. Bernanke (2005, 2007) and Roubini (2008) emphasize that contribution of Japan and Europe to the global imbalances was small relative to that of emerging markets; and the Europe reached aggregately a balanced current account after 2005. Moreover, there are ambiguous findings in the empirical literature. While Legg et. al. (2007) finds that elderly-dependency ratio has significant and negative effect on current accounts; Desroches and Francis (2007) find that the same variable has significant and positive effect on saving rate, which improves current account position. Also, we think that the “ageing population” view [see Cooper (2005, 2007) for the original arguments] does not provide a robust explanation for the emergence of both global imbalances and regional imbalances. For example, it does not explain inner-Europe current account imbalances. While many European countries “suffer from” ageing population, only Germany runs significant amount of current account surplus (see Lapavitsas et. al. (2010) for more illuminative discussion on the imbalances across Europe).

business confidence, currency depreciations or devaluations, sharp falls in domestic asset prices, reforms to restructure banking and financial systems, according to Bernanke (2005). For him, these consequences or the crisis itself affected key relative prices directly and resulted in the flow of financial capital towards safe havens, such as the US. Also, they have changed saving-investment patterns in some crisis-hit countries (see IMF, 2005). Indirect consequences include changing strategies and policies in those countries faced with the crisis, such as precautionary reserve accumulation (Bernanke, 2005). Moreover, according to Bernanke (2005), after the Asian crisis, governments in developing Asia tried to decrease their international debt through channeling domestic savings into international markets by issuing domestic debt instead.

The Asian crisis particularly draws attention due to its size, deepness and its influences on the global level. After the crisis, nearly all East Asia and Southeast Asia countries started to run current account surpluses (see Figure. 4.7). This means that this crisis triggered partly the emergence of the recent global imbalances. One of the most important consequences of this crisis was the sharp decline in the investment rates of the East Asian countries (IMF, 2005). Bernanke (2005) states that “[c]apital overhang, weak corporate balance sheets, and high levels of nonperforming loans –products of the financial crises- help to explain the decline in domestic investment in much of East Asia.” Aggregately, the decline reached more than 10 percentage points of GDPs in the East Asian countries (excluding China) after the crisis and has not fully recovered again albeit the sharp increase in public investment, whereas the saving rate kept its slight downward movement (see IMF, 2005).

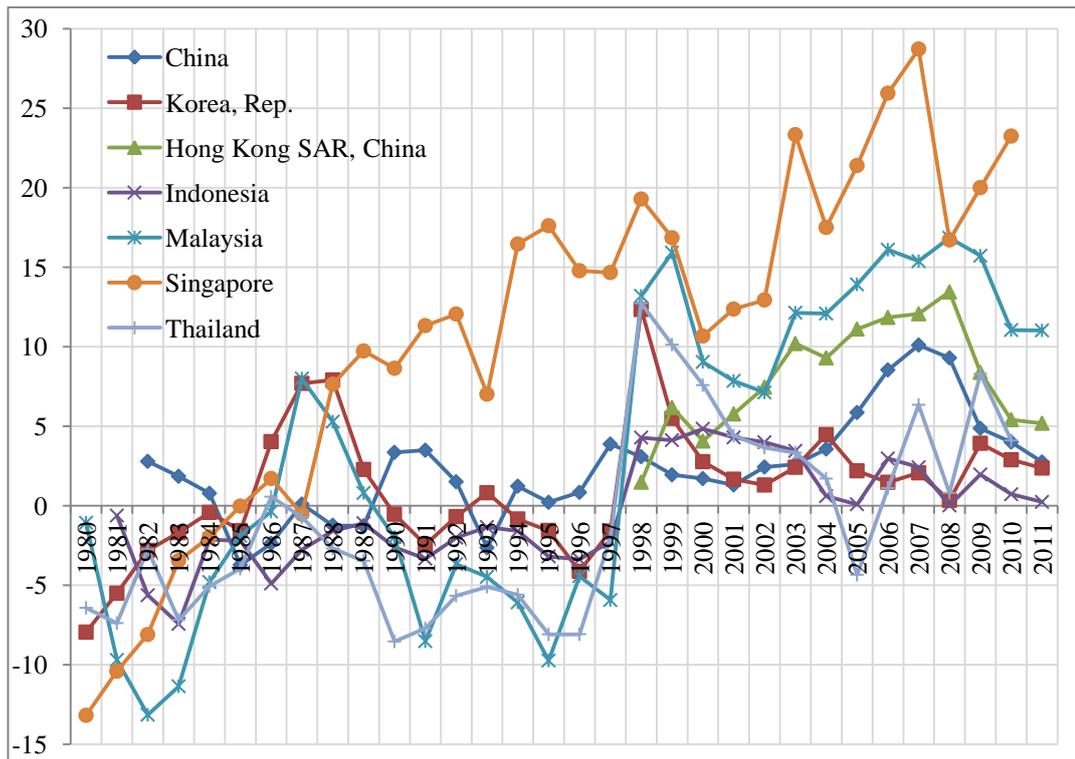


Figure 4.7 Current Account Balances of Selected East Asian and Southeast Asian Countries as a percentage of GDPs, 1980-2011

Source: The World Bank Database.

Another effect of the financial crises of the 1990s was the sharp movements in some relative prices, especially foreign exchanges. Sharp currency depreciation in some of the crisis-hit countries became persistent and all the currencies remained at depreciated levels compared to 1997 level nearly until the global crisis (see Figure 4.8). Much weaker currencies of those East Asian countries were also very likely to contribute to persistent current account surpluses. On the counterpart, the US dollar has appreciated more than 20 percent until 2002 (see Figure 4.9), and its current account deficit started to rise rapidly just after the Asian crisis (see Figure 4.1).

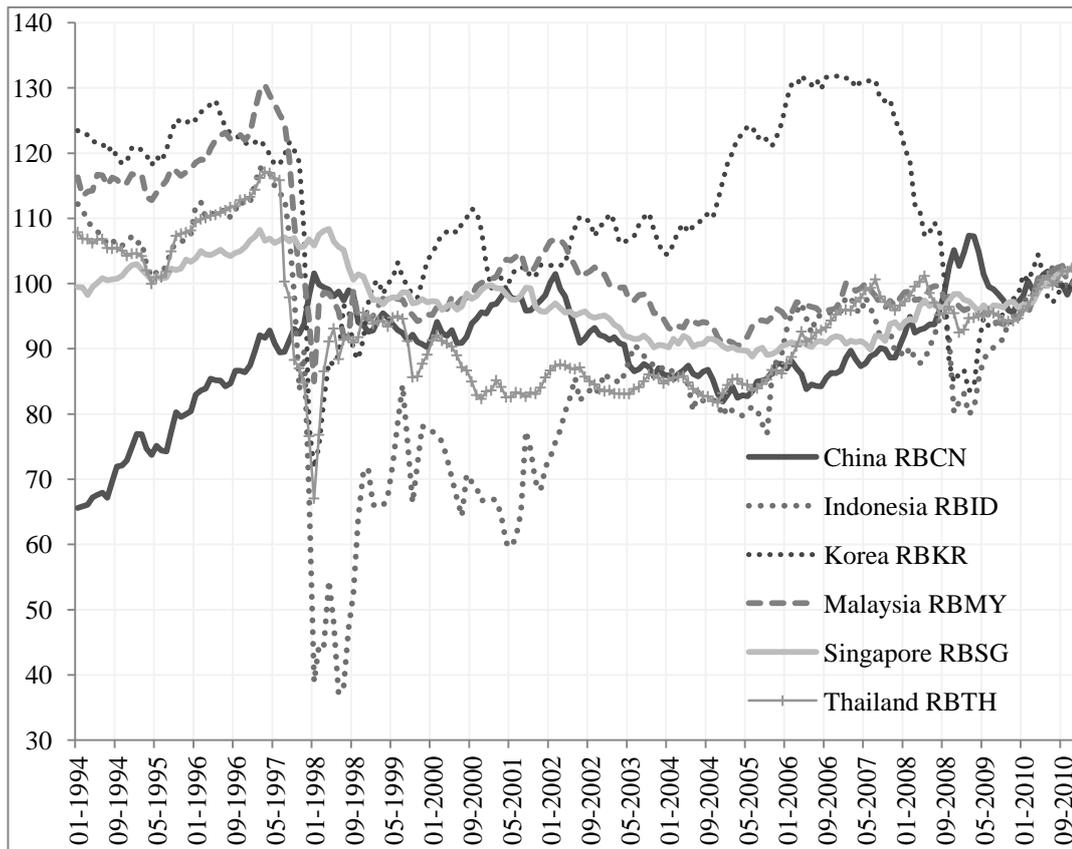


Figure 4.8 Reel Effective Exchange Rate Indices for Selected East Asian and Southeast Asian Countries, 1994-2010 (2010=100).

Source: Bank for International Settlements database.

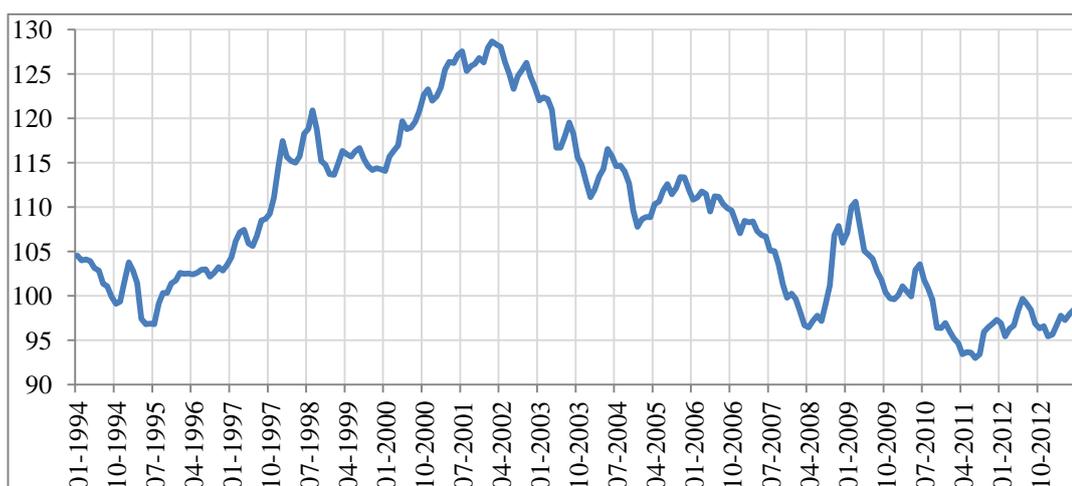


Figure 4.9 Real Effective Exchange Rate Index for the US, 1994-2013 (2010=100).

Source: Bank for International Settlements database.

In one empirical work that investigates the role of the effect of the crises of the 1990s on the current account positions, Legg et. al. (2007)<sup>136</sup> finds that financial crises have a positive and significant effect on the current account balances. However, they note that the effect of the crisis is temporary and remains significant only for two years according to their model. Besides, although it is obvious from the descriptive statistics that the Asian crisis was an important milestone in the build-up of global imbalances and an influential factor on the path of real exchange rates especially for the East Asian countries, however, the US dollar depreciated after 2002 despite increasing net capital inflows. Moreover, during the crisis, while US deficit was diminishing, the US dollar appreciated sharply for a while. As a result, it is hard to link the direct consequences of these financial crises to the recent crisis within or without global excess saving framework.

#### **4.2.2.2. Growth strategies and related economic policies of some developing countries, particularly the role of official reserve accumulation**

Beside the direct consequences of financial crises in developing countries, some studies point out deliberately chosen policies of some developing countries as one of the major causes of the growing global imbalances, so the crisis. Especially those East Asian developing countries which perform well under the export-led growth strategy are at the center of debate. In general, increasing reserve accumulation of the East Asian countries is indicated as the major policy that tries to keep pressure on the appreciation of the domestic currencies vis-à-vis US dollar, thence promoting export and contributing to global imbalances (e.g. Bernanke 2005; Dooley et. al. 2003, Smaghi, 2008)<sup>137</sup>. Bernanke (2005) states the fundamental point of these arguments:

---

<sup>136</sup> The econometric analysis of Legg et. al (2007) covers 34 countries and the period between 1991 and 2005.

<sup>137</sup> Nonetheless, we should note that Bernanke (2007) reminds that global imbalances reflect mostly market developments when he talks about official flows. On the other hand, some others put more emphasis on official flows. For example, Portes (2009) and Frankel (2007) emphasizes the substantial increase in official flows before the crisis adding that foreign central bank purchases of US assets via European financial markets are not included in the data of official flows.

“[i]ncreases in foreign-exchange reserves necessarily involve a shift toward surplus in the country's current account, increases in gross capital inflows, reductions in gross private capital outflows, or some combination of these elements.” Thus, with the channel of global imbalances, official reserve accumulation of these countries may be linked to the causes of the crisis. On the other hand, there are other channels that could link official flows to the causes of the crisis. Since these countries managed or fixed their currencies mostly against the dollar, it follows that official reserve accumulation takes the form of increasing demand for US assets, especially for the safest ones. As it is argued by Caballero and Krishnamurty (2009), demand for safe assets might have brought about rising asset prices (for both riskless ones and risky ones), declining interest rates and risk premia and high leverage. Moreover, Smaghi (2008) argues that “there have been significant purchases by these countries of paper issued by US government-sponsored enterprises, which play a key role in US housing markets”. Finally, as we will discuss below in a detailed way, Warnock and Warnock (2009) find that official flows from the East Asian countries has been partly responsible for the decline in US long-term interest rates.

On the other hand, there are severe critics to some of these views. For example, Obstfeld and Rogoff (2009) draw a special attention to the importance of the US dollar in the world economy and suggest a different explanation for growing official reserve accumulation of developing countries. They argue that even though a country whose currency pegged to US dollar need not hold dollar reserve while it maintains unchanged monetary stance, the motivation behind holding the bulk of reserves in dollar was the liquidity of US Treasury bonds and vehicle-currency role of the US dollar. In fact, as in the case of China, running huge current account surplus with the inflow of huge FDI and hot money, a country needs to alleviate the balance of payment pressures to prevent currency overvaluation and inflation when there exist incoming huge amount of foreign exchange. They argue that when the efforts of China to encourage capital outflows seem insufficient, it used aggressive sterilization and other measures in the US financial markets to keep inflation under control and to repress overvaluation (Obstfeld and Rogoff, 2009). Thus, this explanation implies the necessity of reserve accumulation for these countries rather than their deliberate

choices for promoting growth because of the special role of US dollar in the world economy<sup>138</sup>.

In a similar explanation for the mechanisms, Borio and Disyatat (2011) put the global reach of the monetary policy stance of the Fed at the starting point. They (2011: 26) argue that “[e]ven when a monetary policy stance is appropriate for those [core] jurisdictions, it may not be appropriate for the world as a whole”. They point out strong capital flows to the developing countries when the Fed kept policy rates at low levels after the dotcom burst. As pointed out above, these flows create an upward pressure on domestic currencies, bringing about inflationary pressures and posing a challenge to monetary authorities. Borio and Disyatat (2011) argue that developing countries faced with this challenge by both reducing their policy rates and sterilizing the impact of these flows through accumulating foreign exchange reserves. They admit that those official flows might have depressed long-term interest rates, thence contributed to credit boom; however, the main point they emphasized is that “[w]hile the initial phase of reserve accumulation following the Asian crisis reflected attempts to build up a war chest (precautionary motive), later on, especially from 2004 onwards, “involuntary” accumulation as a byproduct of resisting exchange appreciation became more important” (Borio and Disyatat, 2011: 26).

Another critical stance to the “official flows” argument is, again, provided by Borio and Disyatat (2011), who develops their conceptual precision on this matter. They (2011:10) argue that “the accumulation of foreign exchange reserves is generally a purely financial transaction.” When a central bank purchases foreign assets in order to accumulate reserve, it brings about either a reduction in private sector gross outflows when it trades with a resident or a gross inflow when it trades

---

<sup>138</sup> See also Paineira (2009) for a similar kind of explanation with the help of Marxist “world money” concept. In a similar vein, Paineira (2009) oppose the view of “deliberate choices”, arguing that official reserve accumulation could be detrimental to the development and welfare of these countries. Moreover, both Paineira and Portes (2009) draw attention to that official reserve accumulation was encouraged by policymakers of developed countries and international institutions, such as IMF, after financial crises of the 1990s.

with non-resident, “thereby *leaving the current account unchanged*” (Borio and Disyatat, 2011:11, emphasis in original)<sup>139</sup>.

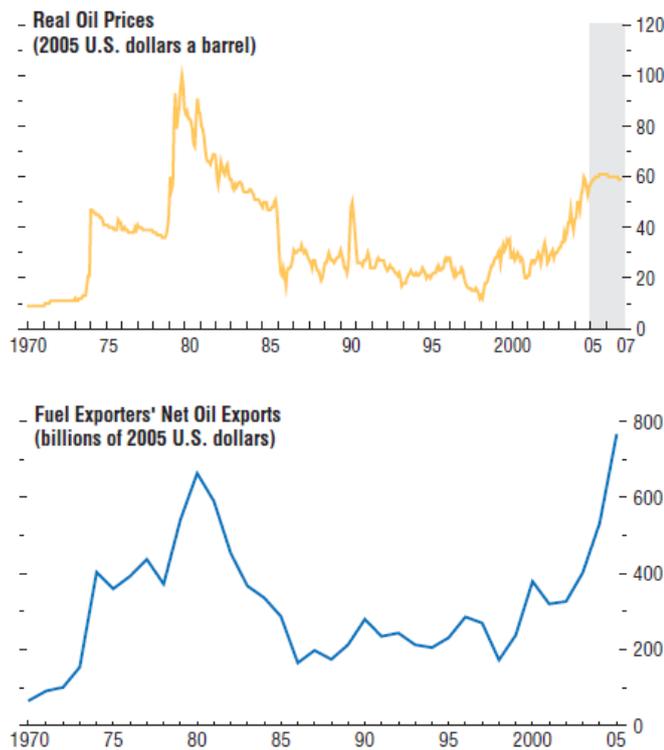
As a result, we can state that, first, the proponents of the excess saving story most probably misdirect the reader about the causes of reserve accumulation. Increasing reserve accumulation was most probably a necessity rather than a voluntary action for those developing countries. Although the debate we presented above is not enough for drawing precise conclusions, it casts doubt on the causality propounded by global excess saving story. Secondly, as noted by Borio and Disyatat (2011), official reserve accumulation needs not to reverberate on “net” flows (current account position) considering offsetting mechanisms through pure financial transactions. Thirdly, although excess saving story focuses on the effects of reserve accumulation on net flows (current accounts), it may still be an influential factor on asset prices or interest rates in the US, considering the effects of official flows in financial markets. Therefore, official reserve accumulation of developing countries might have contributed to the build-up of financial vulnerabilities through suppressing long-term interest rates, raising asset prices and financing the credit and housing boom via creating demand for the agency assets (such as those of GSEs). Therefore, one can point out the effect of official flows on the proximate causes of the crisis without referring to excess saving story. We will discuss empirical findings in the next section, nonetheless, we can argue that there was only very little role, if any, for those official flows among the causes of the crisis. To put it simply, as Borio and Disyatat (2011:6) stated, “the countries seen at the origin of the net capital flows were among those least affected by the crisis, at least through their financial exposures.”

---

<sup>139</sup> They note that “[i]t is, of course, possible to conceive of a current account transaction tied to the accumulation of official reserves ... [b]ut these are exceptions, not the rule” (Borio and Disyatat, 2011:12).

### 4.2.2.3. Escalation in Oil Prices

During the 2000s, rise in global commodity prices and especially oil prices, helped generate current account surpluses for those commodity exporters, and especially oil-exporters, bringing deterioration in importers (see Figure 4.1 for expanding current account surpluses of the Arab World and see Figure 4.10 for real oil prices). According to Obstfeld and Rogoff (2009: 21) the rise in commodity prices has been driven by easy monetary policy, low interest rates and accelerated economic growth in the world economy, especially in the emerging market economies. On the other hand, according to IMF (2006a), rising energy prices after 2003 were driven by increasing global demand and concerns about future supply.



Sources: IMF, *International Financial Statistics*; and IMF staff estimates.

Figure 4.10 Real Oil Prices and Net Oil Exports

Source: IMF (2006a: 72).

Whatever the reason, how commodity prices contributed to excess saving or to interest rates is a contentious issue. It may be argued that recycling of petrodollars might have provided cheap financing resources for the US economy. According to Bernanke (2007), when increases in incomes of commodity-exporters exceed their willingness to consume, it leads up to higher saving in these countries, so contributes to increase in global savings, thereby tends to suppress interest rates. However, this has to be proven, as Roubini (2008) aptly put it. He argues that “the United States has reacted to the oil shock as if it was a temporary one by smoothing consumption ...and thus saving less ... Oil exporters have also been behaving as if the shock is temporary and have saved most of the oil windfall” (Roubini, 2008:169). In this case, changes in savings and changes in income of both oil importers and oil exporters will be matched, and there will be no excess saving and change in equilibrium level of interest rate, but only changes in current account positions. Also, the recycling of petrodollars will have no pressure on interest rates, since they match changing levels of net capital flows between oil importers and exporters under the current equilibrium prices.

Beside the theoretical problems, empirical findings also do not support the role of the recent oil price spike in the build-up of vulnerabilities in the US economy. Firstly, in an interesting study, Desroches and Francis (2007) try to analyze the determinants of “the world real interest rate”, i.e. roughly an average of long-term interest rates of advanced countries, within the framework of saving-investment perspective<sup>140</sup>. They find that after 1989 oil prices played less important role in determining the world interest rate through affecting world saving rate. This might be a result of the stability of oil prices during the 1990s. Secondly, when we look at the geographical breakdown of gross capital inflows to the US, going out of the saving-investment framework, it seems that the OPEC has a very minor share among other countries during the 2000s (see Figure 4.12 in the next section). Although it is possible that petrodollars might have flowed to the European banks, then towards the

---

<sup>140</sup> The econometric analysis of Desroches and Francis (2007) cover 35 countries and the period between 1970 and 2004. They construct the measure of “the world real interest rate” by finding the common factor in the movement of ex-ante 5-year real interest rates of G-7 countries.

US, since gross flows far exceeded net flows before the crisis (see Figure 4.12, top panel), we can argue that they probably played a little role, if any, in the rise-up of financial flows.

#### **4.2.2.4. Differentiation in financial deepness**

It is argued that US current account deficit and current account surplus of some developing countries reflected, in part, the differentiation in financial and institutional structures. The argument bases on the common observation that underdevelopment of financial system, insufficiency in the production of alternative financial assets in some of the developing countries contributed to rise in savings and their flow to the advanced countries, financing ever-growing deficit of some advanced countries. The fact that the US acquired most of these net capital flows is explained by emphasizing well-developed, deep and liquid US financial markets, its strong legal structure, high productivity growth, favorable business environment in the US and consequentially the appeal of the US assets (e.g. Bernanke 2005, 2007; Smaghi, 2008). As an example of financial underdevelopment, China is the mostly referred country by researchers, in line with that China is the mostly referred country as the source of growing global imbalances. The sharp and rapid rising of investment and saving of the country (see Figure 4.11) is mostly attributed to financial underdevelopment. At first, China's relatively excessive household saving rates (see Figure. 4.11, bottom left-hand panel) mostly attributed to structural and cultural factors that hinder consumption, underdeveloped financial system and weak social safety net (Roubini, 2008; Greenspan, 2010a; Obstfeld and Rogoff, 2009; Bernanke, 2007). Despite rapidly growing income, the lack of consumer credits or housing finance, and little social security that might have generated strong precautionary motives are counted as some of the reasons for high household saving rates. Besides, China's corporate saving became ever-increasing and very high, accounting for nearly half of overall saving during the 2000s (see Figure 4.11, bottom left-hand panel). Again, this high saving rate in corporate sector is considered as the reflection of underdeveloped financial sector which have lacks in allocating resources through bond and equity markets whereas the country was experiencing high profitability

(IMF, 2005). In addition, it is argued that it might also have been arisen from the limited access of non-state-owned enterprises to the financial markets (IMF, 2005).

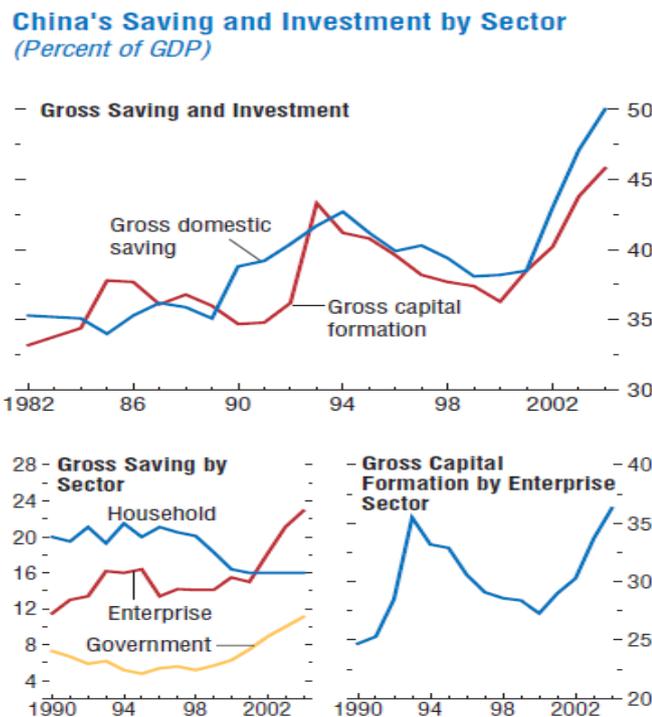


Figure 4.11 Saving and Investment in China

Source: IMF (2005: 96).

Nonetheless, although the foregoing story and supportive descriptive statistics seems reasonable, empirical findings point out ambiguous results. Some could not find significant coefficients in their regressions that take current accounts as dependent variables (e.g. Legg. et al, 2007; Gruber and Kamin, 2008<sup>141</sup>), while some finds significant effects of the differentiation in financial deepness on current

<sup>141</sup> Gruber and Kamin (2008), relying on a data which covers up to 84 countries and the period between 1982 and 2006, and considering multi-year averages of annual observations of variables, focuses especially on the effect of financial development in their regression by taking several different variables of financial development into consideration.

account balances (e.g. Desroches and Francis, 2007). Moreover, Gruber and Kamin (2008) find that the concerned coefficients are not of the expected sign.

In addition, there are other observations that do not support the foregoing arguments and casts doubt on the possible contribution of financial underdevelopment of developing countries to the crisis. For example, since FDI and portfolio investment flowed outside of the US during the 2000s, this casts doubt on the arguments that put forth the attractiveness of favorable investment climate and high productivity growth in the US (Frankel, 2007; Roubini, 2008). Also, there exist large gross outflows from the US to other advanced countries that downplay the argument that US assets, equity or bond yields are more attractive than that of others (Portes, 2009). Moreover, since a significant part of the demand for US assets came from European countries (see Figure 4.12 in the next section), there is only a small role for the effect of developing countries. Even, in fact, financial underdevelopment of developing countries might have contributed to their protection from some of the financial contagion channels. Thus, although these observations are not enough, it seems that there is barely a little, if any, role for the contribution of financial underdevelopment of developing countries to the crisis, because empirical findings that could generally support excess saving story do not find robust evidence on the effect of it over current account balances. Also, since the majority of gross flows materialized among advanced countries, this fact remains a small room for the effect of developing countries, thereby their financial underdevelopment, too.

In sum, after discussing the theoretical framework of saving-investment explanation to global imbalances and the implications of this framework on the ultimate causes of global imbalances, we reject global excess saving explanation to the global imbalances, thence to the crisis. We showed that among the four allegedly ultimate causes of the global imbalances, only the immediate consequences of the financial crises of the 1990s and oil price escalation in the 2000s have important explanatory power on global imbalances. Moreover, we showed that these two factors had very little, if any, to do with the crisis even without relying on excess saving framework. For the other factors, official capital flows and differentiation in

financial deepness, although one can argue that they contributed to the crisis without relying on saving-investment framework, we think that they have little to do with the crisis. For the former one, i.e. official capital flows, we will show that there was a little role in explaining interest rate patterns but this was not enough to attribute huge responsibility to them as implied in the global imbalances literature. Moreover, although we think that differentiation in financial market deepness between advanced and developing countries generate significant consequences for the distribution of international financial activities and it was one of the most important determinants of the structure of international finance; as we will discuss in the next section, the crisis was mostly related with inter-advanced-countries financial relationships rather than the area of the relationships between underdeveloped financial markets and developed financial markets.

#### **4.3. Links of Net capital flows to Housing Boom and Financial Imbalances**

In this section, we focus on the empirical literature that links net capital inflows (current account deficit) to the proximate causes of the crisis. These are low level of interest rates, low risk premia, excessive risk-taking in the financial system, high leverage in banking sector, appreciation of housing prices, increasing credit supply and so on. Although we embrace much of the critics on the saving-investment framework, empirical findings that support the global imbalances explanation for the crisis are still worth-pondering. For example, some of these empirical findings can be helpful to draw inferences within the boundaries of other theoretical frameworks.

Nonetheless, as we will see, many of these empirical researches take net capital flows or current account positions as explanatory variables in their models. Considering the critical theoretical position we embraced, i.e. the bulk of international flows are pure financial transactions, which have no relationship with gross flows, which also have no relationship with net flows, we question the validity of many of these findings with regard to the crisis. However, we do not deny that many of these findings may still be valid, considering the possibility that net flows could still reflect the patterns of gross flows and pure financial flows partly.

Therefore, they seem to be in correlation with dependent variables. Therefore, in this section, we analyze empirical evidences and propositions on possible mechanisms that links capital flows to interest rates, housing boom and financial vulnerabilities, respectively, in three parts. Finally, we analyze the empirical evidences that deny not only excess saving story but nearly whole arguments that point out global imbalances among the causes of the crisis.

#### **4.3.1. From capital flows to interest rates**

First and foremost, the link between net capital flows and low level of long-term interest rates is one of the most important components of all global imbalances stories, but especially for the excess saving story, since low long-term interest rates are seen as “the most likely major cause” of global housing bubble by the prominent advocates of excess saving story (e.g. Greenspan, 2008, 2009; Wolf, 2008; Bernanke, 2010a) or they are seen as an underlying factor of the build-up of financial vulnerabilities (e.g. King, 2010; Portes, 2009). Since the effect of capital flows to the decline in interest rates is linked to the housing boom and the build-up of financial imbalances, in the literature, we review these findings at first.

On the effect of capital flows over long-term interest rates, Warnock and Warnock (2009) provide the most detailed analysis, to the best of our knowledge. Firstly, constructing a multiple regression on several interest rates, mainly on 10-year Treasury bonds, they find that capital inflows to the US depressed long-term interest rates significantly, for the monthly sample covering from January 1984 to May 2005. They argue that even though the model suggests that lowering long-term-inflation expectations and lowering volatility of long rates might have been the most important factors behind the decline of long-rates, their contribution fell primarily on the 1990s and they did not contribute to lowering interest rates during the 2000s, since there had no further improvement in these factors from 1999 onwards (Warnock and Warnock, 2009: 904, 911). Also, their alternative models show that capital inflows had influence on long-term real interest rates. In a similar type of econometric analysis, which covers the period from 1991 q2 to 2007 q3, Cömert

(2013) also supports the findings over the significant effect of capital flows over several long-term mortgage interest rates. Also, by separating the sample into two sub-periods, Cömert (2013) shows that capital flows have been much more influential on long-term interest rates in the second period, from 2002 to 2007, whereas they had not any significant effect during the first period, from 1991 to 2000. Finally, Sa and Wieladek (2010), using VAR methods, estimate a model with four lags on quarterly data from 1975 to the last quarter of 2007, and finds that capital flows shocks have a persistent and adverse effect on long-term interest rates. Although they (2010: 20) apply for the sign restriction on the effect of capital flows over long term interest rates, they state that “the persistent effect of capital flows shocks on long rates is not an automatic outcome of our sign restrictions which are only imposed for four quarters after the shock” while the effect of capital flows last for fifteen quarters significantly<sup>142</sup>. In sum, these findings provide some support to the existence of a link between increasing net capital flows and low interest rates for the US economy.

Secondly, since Warnock and Warnock’s alternative models show that capital inflows have less effect on short-term interest rates and more on long rates, they try to analyze the effects of capital flows on term spreads. They (2009: 904) predict that “[t]he differential effect on the 2- and 10-year Treasury yields implies that in 2004 and 2005 foreign flows flattened the yield curve by about 50 basis points”. Also, Merrouche and Nier (2010) support the main findings of Warnock and Warnock (2009) over the decline of term spreads. For a sample covering 22 OECD countries from 1999 to 2007, they find that lagged current account as a percentage of GDP is the most significant factor that affects the long-term short-term spread among the other factors included in several models, such as growth rate, inflation rate, monetary policy stance, budget surplus and real effective exchange rate.

---

<sup>142</sup> This study also estimates the effect of monetary policy shocks on long rates and shows that they were less persistent (insignificant after eight quarters) than capital flows shocks (Sa and Wieladek, 2010).

Thirdly, Warnock and Warnock (2009) find that reported foreign official inflows put significant downward pressure on long-term interest rates. The most important finding in favor of the global excessive saving story in this study is that “had the twelve months ending in May 2005 seen zero foreign official purchases of U.S. Treasury and agency bonds”, their “estimates suggest that ceteris paribus U.S. long rates would be about 80 basis points higher” (Warnock and Warnock, 2009: 913). Finally, by decomposing those official inflows geographically, they find that “East Asian accumulation is responsible for about two-thirds of [their] estimated impact” of foreign official inflows (Warnock and Warnock, 2009: 905).

As a result, these findings support, in part, global imbalances story which relates net flows from developing countries to the low level of interest rates in the US. In addition, they provide support for the relationship between reserve accumulation of developing countries, especially of East Asian countries, and for the suppression of long term interest rates. Also, findings on the flattening of the yield curve offers insights into the discussion about the effects of declining term premiums on excessive risk taking in the financial system. In our view, evidences on this matter seem strong. However, as we will discuss below with the help of other findings, there may be another explanation to these correlations.

#### **4.3.2. From capital flows to the housing boom**

It is argued that since conventional, fixed-rate, mortgage rates closely follow up long-term interest rates, and since these mortgage rates had influential on the housing demand and housing prices, net capital flows might have contributed to the housing boom through interest-rate channel. As we showed above, Cömert (2013) provide an econometric finding, focusing directly on mortgage interest rates. Also, Warnock and Warnock (2009) support the same results by stating that US mortgage rates depressed by capital inflows. Nonetheless, these studies do not discuss the effects of capital flows on housing boom.

The second transmission channel of global imbalances to the housing boom depends on the interaction between asset prices and capital flows. As we discussed in

the second chapter<sup>143</sup>, many studies draw attention the link between net capital flows and housing prices. Bernanke (2010a) and Obstfeld and Rogoff (2009) find economically and statistically significant correlations between housing price appreciation and net capital flows for a cross-country sample including majorly industrial countries. Besides, Aizenmann and Jinjara (2009), studying on a sample that includes 43 countries, of which 25 are OECD countries, covering the period from 1990 to 2005, find that lagged current account patterns have a significant role in explaining the real appreciation of housing prices. They argue that their model covers the effect of capital inflows via several channels, such as the direct demand on housing and related assets, the wealth effect of inflows through appreciating other domestic assets and through the interest rate channel. In addition, they show that when the changes in current account balances are interacted with financial deepness (measured by domestic credit provided by the banking sector as a percentage of GDP), the real appreciation in housing is magnified; and when they are interacted with “the quality of institutions”, their effect on housing price appreciation is mitigated.

A more comprehensive analysis on this matter, which investigates the effects of monetary policy, capital flows and financial innovation and regulation on housing sector related variables, is provided by Sa, Towbin and Wieladek (2011). Their study covers 18 OECD countries from 1984 to 2007 by establishing a panel vector autoregression (VAR) model. Their main results show that both monetary policy and capital inflow shocks have statistically significant effect on housing prices, residential investment and credit to the private sector. Then, using indices about the development of mortgage market<sup>144</sup>, the degree of securitization activities and the credit regulation quality<sup>145</sup> for the countries in their sample, they measure how much

---

<sup>143</sup> See 2.2.5 “Does monetary policy explain the global housing boom?”

<sup>144</sup> This index covers loan-to-value ratios, the possibility of mortgage equity withdrawal, the cost of mortgage refinancing, the existence of secondary mortgage markets and term structure of mortgage contracts for the mid-2000s (Sa, Towbin and Wieladek, 2011).

<sup>145</sup> This index tries to capture the degree of competition and regulation in the banking sector, covering some indicators (Sa, Towbin and Wieladek, 2011).

capital inflow and monetary policy shocks are propagated within the different financial markets. They find that capital inflows have greater effect on housing sector related variables in the case of higher mortgage market development, in countries where securitization activities advanced more and in countries with more deregulated credit markets. Although they find that monetary policy has also greater effect under similar conditions for their sample, they conclude that “capital inflows coupled with innovations in the mortgage market tend to have a greater effect on the housing sector than monetary policy” (Sa, Towbin and Wieladek, 2011:36).

Although findings of Sa, Towbin and Wieladek (2011) can be read in support of the excess saving view or global imbalances stories, in general; we can interpret some of them in the critic of these views. They argue that “securitization facilitates foreign investment in mortgage loans. Without securitization, it is difficult for foreign investors to hold home mortgage loans directly, because they are of uncertain credit quality and have a higher propensity to default than other assets” (Sa, Towbin and Wieladek, 2011:10). With the improvements in securitization and advancing of tranching, since many of home mortgage loans are packaged into products with high investment grade, it “increases the share of foreign capital inflows allocated to home mortgage loans. This would suggest that securitization may have a particularly strong role in the transmission of capital inflows shocks to the housing market” (Sa, Towbin, and Wieladek, 2011: 10). Indeed, relying on the conceptual differentiation of saving and financing and also relying on our conclusions from the previous chapter, it is possible to argue that if securitization increases financial flows to a country with a balanced current account, then it could raise asset prices, resulting in the deterioration in current account balances. So, securitization may be the driver of both declining interest rates due to the abundance of foreign demand for housing-related assets and current account deficit, while at the same feeding up credit boom (see Chapter 3) and further deteriorating the current account position. Hence, it follows that accompanying net capital flows can be seen as the driver of asset prices, lowering interest rates and housing price boom in an econometric analysis, even though they are the result of pure financial flows in our example. As a result, it is possible to read these findings with the help of another theoretical approach, which

implies directly opposite conclusions. Elaborating on this argument is beyond the scope of this thesis; nonetheless, our reasoning shows that those foregoing findings cannot simply be read as supportive evidences to the causality between global imbalances and the crisis.

In a similar work that analyzes the US case particularly, Sa and Wieladek (2010), using VAR methods and estimating a model with four lags on quarterly data from 1975 q1 to 2007 q4, conclude that while global imbalances played a significant role, monetary policy had only a small and less significant role in housing boom of the US. This finding further confirms our conclusions about the role of monetary policy stance of the Fed in explaining the crisis. Their main analysis shows that while capital flows shocks have significant and positive effect on concerned variables, monetary policy shocks display a positive but insignificant effect on them. Furthermore, making variance decompositions in order to compare relative contributions of the two shocks, they find that capital flows explain a much larger fraction of the variations in key variables. Finally, carrying out a counterfactual analysis that questions what would have happened to real house prices when short terms interest rates remained at its 1998 q4 level, they find that real house prices would have been 8 percent lower in 2007 q4. When the same analysis applied for the case of that the Fed follows the prescriptions of the Taylor rule between 2002 and 2007, it gives that real house prices would have been 5.5 percent lower. However, the same analysis applied for the case of current account deficit remaining at it 1998 level shows that real house prices would have been 13 percent lower.

Finally, as noted by Obstfeld and Rogoff (2009) (but without any empirical findings), there is a likelihood of two-way causality between housing prices and capital flows. It is so, because housing price appreciation may cause higher consumption through raising the net worth of households and making borrowing easier or may cause higher residential investment, thereby it may contribute to the deterioration of current account. On this matter, Aizenmann and Jinjark (2009) provide some econometric findings. Relying on aforementioned cross-country sample, they find that there is no significant reverse causality, however, when they

make Granger Causality test on the US and the UK cases distinctively relying on an extended and high frequency data, they find the existence of two-way causality in these countries.

As a result, both cross-country analyses and single-country analyses that focus on the US case point out a significant correlation between housing price appreciation and net capital inflows. Although all these evidences seem supportive to the role of global imbalances in the crisis, the existence of the two-way causality between housing prices and capital flows, especially on the US case, remains the debate over the validity of the global imbalances story inconclusive, if not weakens it. Moreover, it is possible to interpret such a correlation within another theoretical framework and conclude that both net capital flows (global imbalances) and the crisis are the product of common causes, such as financial innovations and deregulations that allowed for more capital inflow and caused credit boom and the build-up significant financial vulnerabilities at the same time<sup>146</sup>. Hence, it can be concluded that all these findings support the role of global financial flows in housing boom, but they do not need to be read as supportive to global imbalances stories.

#### **4.3.3. From capital flows to financial vulnerabilities**

The role of global imbalances in the build-up of financial vulnerabilities in the US is the third channel that relates global imbalances with the crisis, according to the literature. Again, the effect of capital flows on low interest rates and asset prices constitutes the inner mechanisms that culminated in financial vulnerabilities.

Firstly, Portes (2009) emphasizes that with growing global imbalances and international capital flows, financial intermediation that fell on the part of the US was much more than that of others. Furthermore, he argues that low interest rates and the rise in global liquidity contributed to low volatility in financial markets. Finally,

---

<sup>146</sup> We should note that our view is a little bit different from those of Obstfeld and Rogoff (2009), who argue that both global imbalances and the financial crisis was the product of common causes, among which there was a role for financial innovations, too. The difference is that they also rely on saving-investment framework and argue that there was excess global saving. In fact, we argue that the crisis has nothing to do with global excess saving.

considering the low inflationary environment, low interest rates and low volatility, he argues, this might have brought about search for higher yields, so vulnerabilities in the financial system of the US. With a similar spirit, King (2010) stress on the effect of capital flows on the expansion of balance sheets and creation of complex financial products to satisfy the search for yield. On the other hand, as we mentioned above, it is argued capital flows resulted in the suppression of term spreads (Warnock and Warnock, 2009; Merrouche and Nier, 2010). When banks have nominal targets for their return on equity, this suppression of term spreads creates an incentive to expand balance sheets, according to a view. The explanation of this mechanism is as follows. Since banks borrow short and lend long, when the term spread gets smaller, this will lead to lowering of margins. Therefore, in order to maintain their targets for the return on equity under the condition lowering margins, banks will have an incentive to expand their balance sheet, so increase leverage or banks will have an incentive to take more risk, creating demand for riskier assets and bidding up their prices in the end (Merrouche and Nier, 2010; Sa, Tobin and Wieladek, 2011)<sup>147</sup> (see below for empirical evidence on this point).

Secondly, Caballero and Krishnamurty (2009) argue that capital inflows due to excess world savings that search for safe assets in the US resulted in high level of financial fragility<sup>148</sup>. By the theoretical model they constructed, they argue that when foreign demand increase for riskless (safe) assets, the value of risky domestic assets also rises. This implies that when foreign official flows (mainly sourced from the East Asia) increased and raised the prices of government and agency bonds, the prices of riskier assets (e.g. mortgage-backed securities) will also increase. Secondly, they argue, this demand for safe assets lowers interest rates directly and also puts more downward pressure on interest rates by increasing precautionary savings because, as time passes, foreign debt is accumulated, so foreign leverage increases, which implies increasing risks. Thirdly, according to their model, foreign demand for safe assets lowers risk premium on domestic assets, assuming that foreign inflows to

---

<sup>147</sup> These arguments draw on the original studies of Rajan (2005) and Borio and Zhu (2008).

<sup>148</sup> Bernanke (2011) supports also these views.

US increase stability, or assuming that inflows increase domestic wealth and decrease absolute risk aversion, resulting in lowering risk premia. Finally, since external leverage increases over time in this model, at some point, residual risks that are transferred onto domestic equity holders raise risk premia. As a result, Caballero and Krishnamurty (2009) argues that excess world savings and associated capital inflows made the financial system more fragile through rising asset prices (for both riskless ones and risky ones), lowering interest rates and risk premia, and bringing about high leverage in the financial sector.

In addition, for the asset price connection, Obstfeld and Rogoff (2009) point out that, historically, the large net capital inflows that inflate asset prices make difficult to tighten regulation in financial sector since they allow financiers to enlarge their balance sheets.

Some of these views are supported by empirical findings. Merrouche and Nier (2010) provide a comprehensive empirical study on the factors that cause the build-up of financial imbalances by constructing multiple regression models for a cross-country sample (22 OECD countries) from 1999 to 2007, in which the level of leverage is the dependent variable, measured by mainly the ratio of bank credits to bank deposits, including some other measures for robustness. They consider “the rapid expansion of credit sourced in wholesale funding markets” as an indicator of growing financial vulnerabilities and they take the ratio of private credits to deposits as an indicator of bank leverage sourced from wholesale funding markets (Merrouche and Nier, 2010:6). They find that differences in capital flows for the countries in the sample have statistically strong effect on balance-sheet expansion and banking sector leverage during the 1999-2007 periods, while deviations from the Taylor rule have not significant effect on these variables. They also argue that from 2004 onwards, compression of term spreads became an important mechanism between capital flows and high leverage, adding that differences in monetary policy stances across countries had no role on this compression (the mechanism is presented above). Moreover, this study makes robustness tests by taking household sector leverage, some broader leverage measures regarding to financial sector and housing

prices as dependent variables and shows that capital flows differentiation across OECD countries became the key determinant among other factors in explaining financial imbalances. Finally, adding five variables (indices) into the model in order to measure the effect of interaction of macro variables with regulatory and supervisory structure, they find that when the power of regulatory bodies in disciplining financial system and the power of resolution system is higher; when the barriers to entry in financial sector is tougher and when the central bank of a country is in charge of regulation and supervision, banking sector leverage through wholesale funding markets become less pronounced and the effect of capital inflows are reduced.

These empirical findings are also in support of the view that increasing competition in financial sector, weakening regulation and supervision and widespread moral hazard became the forces that fed up the build-up of vulnerabilities in the US financial sector, contributing to the expansion of balance-sheets and increasing leverage. In line with our interpretations to the findings of Sa, Towbin and Wieladek (2011) in the previous part, we can interpret these empirical evidences in the same fashion, too, concluding that home-grown financial sector problems, say worsening regulation and supervision with the rise of precarious financial innovations might have been the driver of both financial vulnerabilities and deteriorating current account positions. Indeed, Merrouche and Nier (2010:11) provide more evidences to this idea: “the importance of the banking sector in providing credit has differed across countries and ... in some countries, the share of domestic credit provided by non-banks and through securitization off the balance sheet of the banking system was sizable”. Moreover, they find that “across countries ahead of the crisis, there has been a fairly tight correlation between the size of current account deficits and the issuance of mortgage backed securities, with a correlation coefficient of 58 per cent, significant at the one per cent level” (Merrouche and Nier, 2010: 27). Although, they read these findings in the context of global imbalances explanation to the crisis, with the critical approach provided by Borio and Disyatat (2011), these findings can also be read as supporting evidences to our view, until proven otherwise.

In fact, a striking feature of the empirical literature that we present in this section is that although all the studies provide evidence in favor of the role of global imbalances (net capital flows) in the crisis, the studies that add finance-related variables (indices about regulations and innovations) into their model provide also evidences on the growing vulnerabilities and an increasing role of net capital flows on them. According to the authors of such studies, this suggests that both home-grown financial problems and global imbalances may explain the crisis (e.g. Merrouche and Nier, 2010). However, as we argued above, both global imbalances and the recent crisis might have been the result of home-grown financial problems of the US. Indeed, the next part will both enhance this view and add new dimensions to it.

#### **4.3.4. Empirical evidences that deny “global imbalances” explanation of the crisis**

Despite the existence of many empirical findings in support of the global imbalances story of the crisis, there are important evidences that completely deny it and point out other vulnerabilities.

Firstly, Borio and Disyatat (2011), displaying only descriptive statistics, draw attention to how the story changes when one considers gross capital flows instead of net capital flows and current account balances. In order to follow closely, we provide the figures generated by Borio and Disyatat (2011) below (see Figure 4.12). The first graphic shows that gross global capital flows have increased substantially between 2002 and 2007 and the bulk of these flows materialized between advanced economies, whereas emerging market economies (EMEs) have had little share. The second picture focuses on the US balance of payment statistics and displays that while current account deficit has been widening since the early 1990s, the growth of gross flows has far exceeded the growth of net flows, reaching a substantial volume especially at the onset of the crisis. Moreover, top right-hand panel in the second picture shows that the bulk of gross inflows was belong to private sector, despite the emphasis of some proponents of global imbalances story on the official inflows to

the US. A striking point from this panel is that although official inflows grew substantially and occupied a significant share before the crisis, they kept their volume during the crisis despite a mild decline, whereas gross private inflows plummeted during the crisis. In line with this, the geographical breakdown of gross capital inflows point out that advanced economies, especially euro area countries and the United Kingdom held the lion's share, whereas EMEs had only a small share. What is more, those countries that held the lion's share did not run current account surpluses, and indeed the UK did run deficit before the crisis, while the euro area was roughly in balance (see Figure 4.1). As in the case of gross official capital inflows, during the financial crisis, the gross capital inflows coming from China kept their pace, whereas those coming from advanced economies plummeted. As aptly put by Borio and Disyatat (2011:15), “[i]f anything, official flows from Asia and oil exporters were a stabilizing force during the crisis.” Also, the geographical breakdown of gross capital outflows from the US displays the importance of advanced economies in international financial flows. Finally, since we know that current account deficit of the US narrowed only slightly during the turbulent years, 2007-2008 (see Figure.4.1) and the same period witnessed the collapse of gross flows, Borio and Disyatat (2011:15) aptly puts that “net capital flows do not capture the severe disruption in cross-border interbank lending nor do they correctly predict the source of strains”.

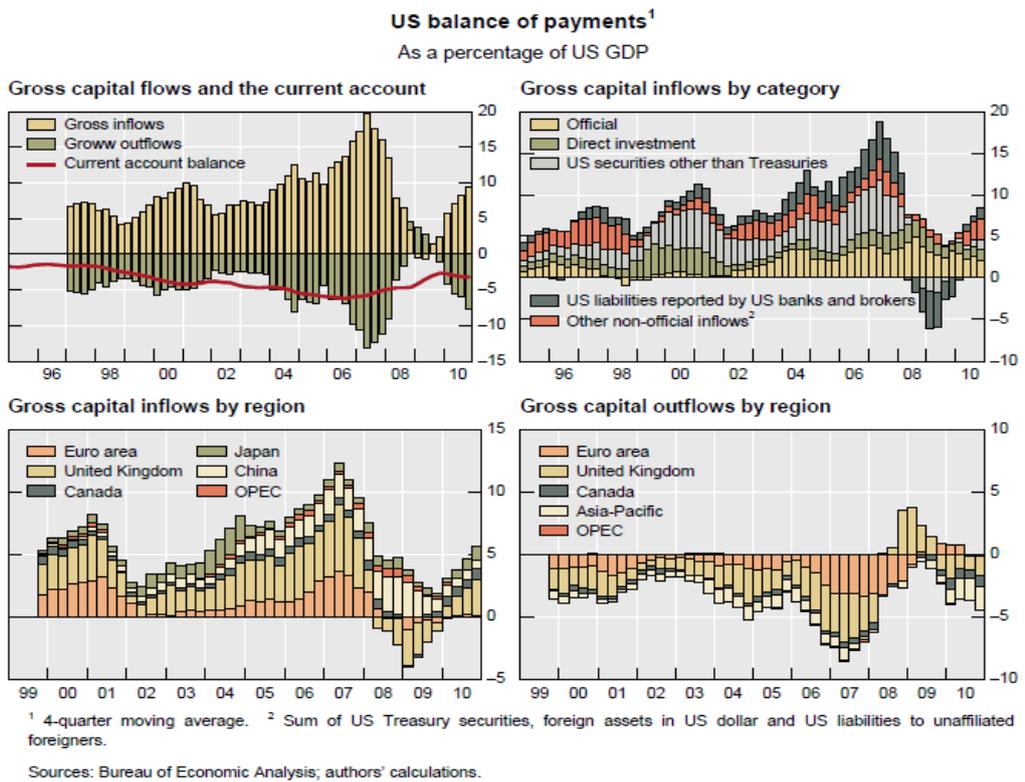
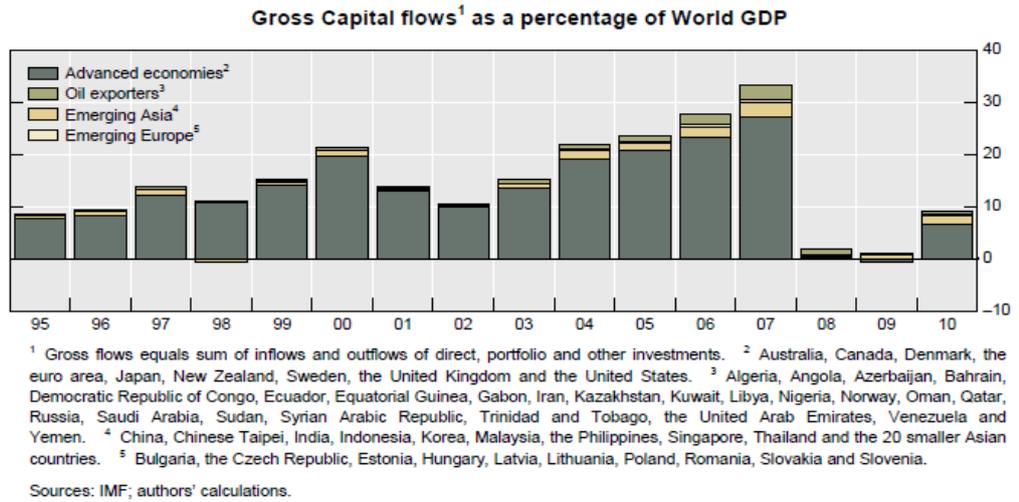


Figure 4.12 Gross Capital flows as a percentage of World GDP and US balance of payment

Source: Borio and Disyatat (2011:14).

Besides, Borio and Disyatat (2011) provide complementary evidence on the importance of large European banks in the build-up financial vulnerabilities,

analyzing the consolidated balance sheets of banking systems on the basis of the nationality of their headquarters relying on the BIS (the Bank for International Settlements) data. This analysis shows that US dollar-denominated positions became an important driver of the expansion of foreign assets of European banks, reaching some \$8 trillion in 2008, of which, between \$300 and \$600 billion was financed by short-term instruments. According to Borio and Disyatat (2011:18) “[t]his explains the surprising funding squeeze that hit these banks’ (and others’) US dollar positions, and the associated serious disruptions in foreign exchange swap markets”. Also, this may help explain the appreciation of the dollar during the crisis, which cannot be explained by the movements in net flows, since during the crisis US current account was improving.

Hence, relying on these findings, it can be argued that these evidences are inconsistent with the global imbalances explanation of the crisis. They show that the Asian countries or developing countries play little role in financing the credit boom of the US, relying on the conceptual difference between saving and finance and its implication on the interpretation of net flows and gross flows. Moreover, they show that much more role in financing the credit boom of the US fell on the European banks. As it is aptly put by Borio and Disyatat (2011:20), “[t]he focus on global current account imbalances misses the role of European banks in supporting the boom in US housing credit and the subsequent collapse of such financing.”

One of the implications of the foregoing evidence is further supported by Acharya and Schnabl (2009), who conclude that the global spread of the crisis has more to do with banking flows rather than global imbalances. Relying on the data over ABCP conduits of the largest commercial banks of mainly advanced countries, they argue (2009:4) that “our results suggest that the geography of the financial crisis depends on the incentives of global banks to manufacture riskless assets rather than the direction of capital flows”. Their sample covers 64 commercial banks that sponsored 73 percent (\$903 billion) of all ABCPs sold to investors as of January 2007. In sum, their basic findings are as follows: the sponsoring banks of the conduits of the sample were headquartered mostly in advanced countries, including

both surplus and deficit countries; nearly three quarters of those ABCPs were issued in US dollars; mostly, they were sold to risk-averse investors, such as money market funds; and the proceeds were invested primarily in highly-graded long-term assets of the US and the UK, both of which are deficit-countries. However, when they look at the correlation between ABCP outstanding of conduits, according to their sponsoring banks' nationality, and current account balances, they do not find any significant relationship. Thus, they conclude (2009:17) that “the fragility of a country’s banking sector, as measured by its exposure to ABCP conduits, is unrelated to the direction of the global imbalances. Both banks in surplus countries and banks in deficit countries sponsor ABCP conduits”. Moreover, they show that banks with higher ABCP exposure, regardless of their nationality and their countries’ current account position, were much more affected by the crisis when it hit the ABCP markets in August 2007. Hence, as opposed to the implications of global imbalances view, which point to the problems and vulnerabilities of the financial sector of the deficit-countries, the fact that “the financial crisis materialized at the very onset – in August 2007 – also in many of the surplus countries”<sup>149</sup> shows that the eruption of the crisis and its spread had nothing to do with global current account imbalances, but it had to do with global banking systems and their significant exposure to substantial risk of the mortgage-related products.

#### **4.4. Conclusion**

In this chapter, we have analyzed the role of global current account imbalances in explaining the causes of the crisis, focusing mostly on one of the most popular approaches that link global imbalances to the crisis, which is global excess saving view. According to this view, relatively excess saving over investment in East Asian developing countries, oil-exporting countries and Germany and Japan created global excess saving that flowed into some advanced countries with current account deficits, particularly the US. Thus, relative excess savings of some countries are

---

<sup>149</sup> Moreover, Acharya and Schnabl (2009:5) argue that they do not view the spread of the crisis to European countries “as a “transmission” from the US; instead as a direct financial exposure to the US, that is uncorrelated with trade exposure to the US”

pointed out as the real factors that suppressed long-term interest rate and reinforced housing and credit boom, thence contributing to the vulnerabilities in the US financial system.

However, we argue that saving-investment approach has significant theoretical problems; it does not explain some remarkable phenomena and it overstates the role of global imbalances on the crisis, if any. Firstly, the conceptual difference between saving and financing is embraced in this chapter. The reason for this: investment requires “financing” and it can be constrained by financial conditions, not by saving; and, it only equals to saving in a closed economy case because of the construction of national accounting. For a long time, it has been argued that the financial system can endogenously generate purchasing power and financing tools. Also, in fact, financing activities far exceed the level of saving in the economy. These imply that investment is constrained only by financial conditions, not by saving, which only adjusts itself to the level of investment in the end because both saving and investment represent non-consumed part of income and non-consumed part of expenditures, respectively, in national accounts. Similarly, in the open economy case, the confusion about saving and financing reflects itself in the distinction between net flows and gross flows. In that case, while, by the construction of accounting, domestic investment exceeding domestic saving is equal to net capital inflows, but this does not say anything about international financing conditions of domestic investment and international financial flows, which can be followed from gross capital flows more appropriately.

What is more, relying on saving-investment perspective, some argue that relative excess saving over investment in developing countries explain the decline in long-term interest rates across advanced countries. If it is the case, those countries that run current account surplus are supposed to become the sources of financial excesses or of the factors that promotes cheap financing for housing boom in the US. However, first, there is no reason to argue that improved current accounts in one part of the world will cause pressure on interest rates on the other part, considering that adjustment could occur only with the changes in quantities or with the changes in other prices. Secondly, the existence of a “natural interest rate” determined by global

saving and investment balances is a contentious issue. For example, both Marxian and Keynesian schools question the determination of interest rates by directly “real forces” from different theoretical backgrounds. As aptly put Borio and Disyatat (2011), even if it exists, actual interest rates are actually determined by financial and monetary conditions; and, even if it is considered that the natural interest rate and market interest rates have an interaction, supposing that the natural rate steers long-term market interest rates to its steady state equilibrium, then there is no reason for arguing that low level of long-term interest rates created excesses in real economy. Thus, we can state that the reliance on the concept of “equilibrium” and relying on the determination of market interest rates through “natural interest rate” does not have any explanatory power for the crisis within the framework of global excess saving story. As a result, relying on this theoretical discussion, we simply argue that for the explanation of low long term interest rates and of global financial flows, “global excess saving story” is very dubious.

Moreover, after discussing the theoretical framework of saving-investment explanation to global imbalances and the implications of this framework on the ultimate causes of global imbalances, we completely reject global excess saving explanation to the global imbalances, thence to the crisis. We showed that among four allegedly ultimate causes of the global imbalances according to global excess saving view, only the immediate consequences of the financial crises of the 1990s and oil price escalation in the 2000s have important explanatory power for global imbalances. Moreover, we showed that these two factors had very little, if any, to do with the crisis even without relying on excess saving framework. On the other hand, it is hard to conclude that official capital flows from the East Asia and the differences in financial deepness were the sources of global imbalances. Although one can argue that they contributed to the crisis without relying on saving-investment framework, we showed that they have little to do with the crisis. There is only a little role for official capital inflows in explaining interest rate patterns but this was not enough to attribute huge responsibility to them as implied by global imbalances proponents. Moreover, as we showed, the financial crisis was mostly related with the

financial relationships between advanced countries rather than the relationships between underdeveloped financial markets and developed financial markets.

Nonetheless, the findings of the empirical literature that focuses on the effect of net capital flows on the proximate causes of the crisis would still support channels through which global imbalances might have contributed to the crisis. The literature shows that net capital inflows to the US partially explain declines in long-term interest rates and term spreads, low mortgage rates, housing price acceleration and financial sector excesses, such as high-leverage. Relying on the critical theoretical position we embraced, i.e. the bulk of international flows are pure financial transactions, which have no relationship with gross flows, which also have no relationship with net flows, we questioned the validity of these findings with regard to the crisis. First, we draw attention to the existence of empirical findings in support of the view that both net capital flows and financial sector related problems (increasing competition in financial sector, weakening regulation and supervision, widespread moral hazard and very effective financial innovations, such as securitization) became the forces that contributed to build-up of vulnerabilities in the US financial sector. Then, relying on the conceptual difference of saving and financing and also relying on our conclusions from the previous chapter, we propose that if, for example, financial innovations and deregulations paved the way for the generation of a credit boom, this would have increased consumption and investment activities, precipitating the deterioration in current account position. When the process advances with its own dynamics, it can draw more foreign financial resources, further feeding into credit boom and deteriorating current account position. Thus, both global imbalances (net capital flows) and the crisis-driving factors seem to have a correlation. This reasoning is not proven, but it shows that it is possible to read these empirical findings with the help of another theoretical model, which implies different conclusions about the causality between global imbalances and the crisis.

What is more, the analysis of gross capital inflows to the US disapproves the implications of any kind of global imbalances stories over the role of developing

countries in the build-up of financial vulnerabilities of the US. Firstly, as it can be seen from the figures of this chapter, during the financial crisis, net capital inflows reduced slightly for the US economy, but this does not mean that international financing conditions reduced also slightly. When both gross inflows and gross outflows of the same period are observed, it is obvious that global financing conditions were egregious since gross flows plummeted in 2008. This enhances the importance of conceptual clarification between saving and financing. Moreover, when international financing conditions for the US are observed by investigating “gross capital flows”, it reveals that gross flows increased so much that there seems that they have no correlation with net capital flows, as theory suggests, especially during the 2000s. This implies that empirical researches that take net capital flows or current account positions into consideration rather than gross flows may misapprehend the international sources of the financial vulnerabilities in the US. Moreover, when the geographical breakdown of gross inflows to the US and their sources –whether they are official flows or private flows- are investigated, it obviously appears that the East Asian developing countries and official capital flows from these countries played only a minor role in financing the credit and housing boom, as opposed to the claims of excess saving story or of other global imbalances stories. On the contrary, the European countries, including both surplus- and deficit-countries, and private sector held the lion’s share among other components of the US gross inflows. Finally, as opposed to the implications of global imbalances view, which point to the problems and vulnerabilities of the financial sector of the deficit-countries only, the outbreak of the crisis and its contagion channels show that both deficit- and surplus-countries in the advanced world were hit by the crisis nearly at the same time via the exposures of their large banks to the mortgage-related assets. This last point implies that the eruption of the crisis had nothing to do with global current account imbalances, but it had to do with global banking systems and their significant exposure to substantial risks of the mortgage-related products. Thus, it is fair to argue that even when one leaves aside the saving-investment approach to global imbalances, which has many theoretical problems and could not robustly explain even global imbalances, global imbalances story, in general, misinterpret the

international sources of the crisis, such as the role of European countries in the build-up of financial imbalances, and it miscasts and exaggerates the effects of developing countries on global financing patterns and on the crisis.

## CHAPTER 5

### STRUCTURAL CAUSES OF THE CRISIS

On the debate over the causes of the crisis, many radical explanations (mostly some Post-Keynesians and Marxists)<sup>150</sup> focused on the structural or long-term real-sector related causes of the crisis, sharing more or less the view that beyond the short-term financial aspects of the crisis or regulatory and policy failures, inherent problems of the neoliberal period or capitalism, in general, paved the way for the breaking out of a deep structural crisis. Some accounts on the causes of the crisis reached back to the emergence of neoliberal transformation at the late 1970s; while some dated back their starting points even before the 1970s. All these aimed at giving an account for underlying tendencies of capitalism or of the particular era of capitalism that resulted in the most severe, system-wide and global crisis since the Great Depression of the 1930s.

There are significant differences between theoretical foundations of different narratives, thereby their explanations for the crisis. Nonetheless, there are also fundamental points shared in some cases, by different views. In this respect, this chapter will investigate some of the prominent ideas that focus on common themes and it will discuss some propositions with the help of critics and empirical researches on these points.

One of the common points, which we will work on, is the link between the divergence between the path of productivity growth and the path of real wage

---

<sup>150</sup> The views that will be analyzed elaborately in this chapter are not shared by everyone who associated himself/herself to these schools.

growth, growing income inequality, inadequacy of aggregate demand and the crisis. The other point, which we will work on, is the link between contradictory recovery of profitability after the late 1970s and the crisis. The common component in both of these interpretations is that structural problems related with profitability or aggregate demand were alleviated with the mechanisms of finance during the neoliberal era. It is argued that contradictions of the neoliberal period or of capitalism have been suspended either by growing indebtedness or asset bubbles or financialization in general. Finally, the common argument points out that when financial problems erupted, structural weaknesses revealed and this explains the intensity of the crisis.

In this chapter, we mainly argue that developments and transformations in the real-side of the economy during the neoliberal period can be very useful to understand the underlying structural transformations that ended up with the most severe crisis since the Great Depression. However, the large part of the arguments we analyzed shows weaknesses because of the way they followed while approaching financial-side developments, generally attributing a secondary and functional role to them. We mostly focus on the arguments that pointed out inadequate aggregate demand and inequality as the underlying causes of the crisis. Analyzing the implications of this view, we will show that many of the implications of this argument do not match with the real sector patterns we observed for the last three decades. These mismatches, on the other hand, are explained by some financial phenomena of the recent decades, arguing that those phenomena are caused by increasing inequality. However, it is dubious that increasing inequality caused financialization, asset bubbles or credit booms. Finally, focusing shortly on the arguments that stress on long-term profitability patterns as the main underlying cause of the recent crisis, we argue that some of these interpretations have also similar problems to that of inequality-based explanations considering mismatches with the facts and their approach to finance. Nonetheless, we argue that there was still a role for profitability in the explanation of the deepness of the recession and post-crisis stagnation, even if the profit rate patterns could not be linked to the financial characteristics of the recent crisis.

The structure of this chapter is as follows. Firstly, we discuss the proposals based on the analysis of aggregate demand and income distribution. Secondly, we discuss the proposal based on the analysis of profit rates. Since some of the Marxian interpretations focus on both of these themes, we divide and analyze different interpretations according to their affinity with different crisis theories.

### **5.1. Were Inequality and Aggregate Demand Problems the underlying causes of the crisis?**

Main arguments that we focus on in this part comprise of three steps, and summarized in Figure.5.1 below. Firstly, many interpretations which have roots in different theories point out the severance of labor productivity growth and real wage growth after the late 1970s as the first and foremost underlying root cause of the aggregate demand problems and growing inequality, alongside some other factors. Many interpretations point out declining wage share as a result of this severance, and its consequences as a tendency on the consumption demand and indirectly on the investment demand. On the other hand, some interpretations from Marxian origins point out the effect of this severance on the realization of surplus value and declining capacity utilization. As possible roots of widening inequality and aggregate demand problems, different schools give different proposals. Some focuses on neoliberal institutional structure and policies adopted, while some emphasizes on broader structural problems about mature capitalism. Secondly, these arguments mainly connect the rise of financialization, repeating asset bubbles and increasing indebtedness in household and corporate sectors to the same origins. Some argues that increasing inequality, thereby growing funds in the hands of the wealthy part of the society was the source of funds for financial sector and growing asset bubbles or the source of motivation in creating new, exotic financial products. Furthermore, growing inequality, thereby relatively worsening conditions of workers and low-income groups are connected to the rise of household indebtedness after the 1980s. Finally, the limits of indebtedness or the lean of asset bubbles to the crisis are mainly pointed out as the final steps that allow for the outbreak of the fundamental contradictions of the recent era.

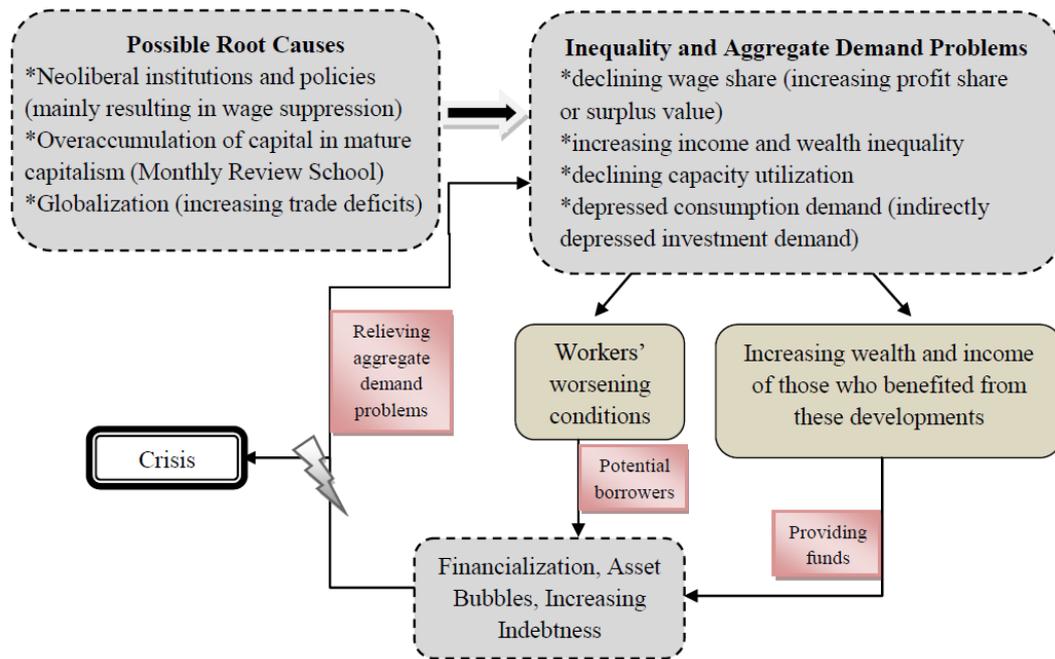


Figure 5.1 Summary of the arguments that links rising inequality to the crisis

In this section, we review the literature that fits more or less the scheme above with the help of critical approaches and empirical findings. Firstly, we will focus on some arguments of non-Marxian heterodox approaches. Secondly, we will analyze main arguments of Marxist approaches on demand-related structural weaknesses. Finally, we will analyze the link between inequality and financial excesses.

### 5.1.1. Heterodox approaches on wage stagnation and inequality as the root causes of the crisis<sup>151</sup>

Some of the heterodox scholars argue that wage stagnation, growing inequality and aggregate demand problems underpinned the structural problem that revealed with the recent crisis. For example, Palley (2009, 2010) argues that, fundamentally, the embracement of neoliberal growth model in the post-1980s, and, additionally, flawed engagement of the US economy into the global economy undermined the demand generating mechanisms of the US economy or directed the demand out of

<sup>151</sup> I group the views of those non-Marxist scholars that focus on inequality and demand problems under this heading.

the US economy. The function of growing indebtedness and recurrent asset bubbles was to fill the hole in the aggregate demand but these alleviating mechanisms were bounded to exhaustion, according to him<sup>152</sup>.

Palley (2009, 2010) argues that four major economic policies that are embedded in the neoliberal growth model severed the link between productivity and wages, once the engine of the postwar growth, according to him. These policies are the replacement of the commitment to full employment with the commitment to inflation control, small government policies including privatization and deregulation, assuring labour market flexibility with attacking unions and labor-protectionist policies, and the adoption of globalization policies that forces the workers to accept wage suppression. In Palley's (2009) account, the suppression of wage growth with the implementation of neoliberal policies undermined aggregate demand growth.

In theory, it is argued that the equality of real wage growth and labor productivity growth is the mechanism which keeps the economy in equilibrium and in a long-run stable growth path and this was the major dynamic that generated the "golden age" after the World War II (Palley, 2009; Setterfield, 2010)<sup>153</sup>. In a more formal way, Setterfield (2010: 6) states that "while real wage growth fuels the largest single component of total expenditures, productivity growth plays a similarly prominent role in the expansion of potential output. This means that equality in the rates of growth of real wages and labour productivity will more or less suffice to keep total expenditures and potential output – or "aggregate demand and aggregate supply" – growing at the same rate". Thus, it is argued that the equality of the real wage and productivity growth is a key to the sustainable long-run growth. A natural corollary of this argument is that the divergence of the paths of real wages and labour productivity after the 1970s was the underlying cause of the recent crisis.

---

<sup>152</sup> See Setterfield (2010) and Wisman (2013) for other heterodox views that attribute the causes of the crisis to widening inequality and stagnationist tendencies in the aggregate demand. Also, Stockhammer (2012) presents partly a similar account.

<sup>153</sup> See Setterfield (2010) for a basic theoretical model from Keynesian origins that assert this view.

Since it is assumed that wage component of national income is most likely to be consumed, these arguments attributes an important role to the stability of wage share in demand generation. Stockhammer (2012) argues that declining wage share as a result of neoliberal policies might have had a negative effect on aggregate demand relying on the hypothesis of wage-led growth, which proposes that the consumption effect of changing wage share will be greater than its potential positive effect on the investment demand and export demand. In a supporting manner, Setterfield (2010) argues that although it is possible that real wage stagnation may stimulate investment and export demand, this was not the case for the US economy, except for the 1990s. Moreover, Wisman (2013) argues that weak consumption demand resulted in the suppression of investment demand in the US economy. Thus, heterodox scholars point to the adverse effects of real wage stagnation on the wage share and aggregate demand in the US economy.

In general, it is argued that the deterioration of income distribution as a consequence of wage suppression decreases consumption demand due to higher marginal consumption propensity of the poor. Stockhammer (2012:11) posits that “rising inequality has, other things equal, a negative effect on consumption expenditures and thus on aggregate demand”, adding that other things were not equal during the neoliberal period, referring to the effects of increasing borrowing on the consumption demand. In a similar vein, Setterfield (2010) shows theoretically that with the violation of the equality of real wage and productivity growth, all other things equal, the US economy should have experienced inadequate aggregate demand generation, and so slow growth with rising unemployment.

Theoretically and empirically, these views point to several common indicators. Two indicators are critical in these approaches: comparative paths of real wage and productivity indices and the path of wage share in national income accounts. As it is shown below, there is no doubt that there has been a significant divergence between the growth rates of real wage and labour productivity in the US after the 1980s (see Figure 5.2). As it is noted by Setterfield (2010:7), this figure excludes wages and salaries of supervisory workers and when all wages and salaries considered, they

“showed a less marked departure from the rate of productivity growth over the same period”. It is clear that such a pattern of productivity-wage gap increases inequality among the wage earners, including managers. Nonetheless, the main concern of the arguments depicted above is the adverse effect of this pattern on the aggregate demand generation. Therefore, the main question is whether the severance of real wage and productivity growth paths caused any sign of inadequate aggregate demand, including wage share and consumption share in national income.

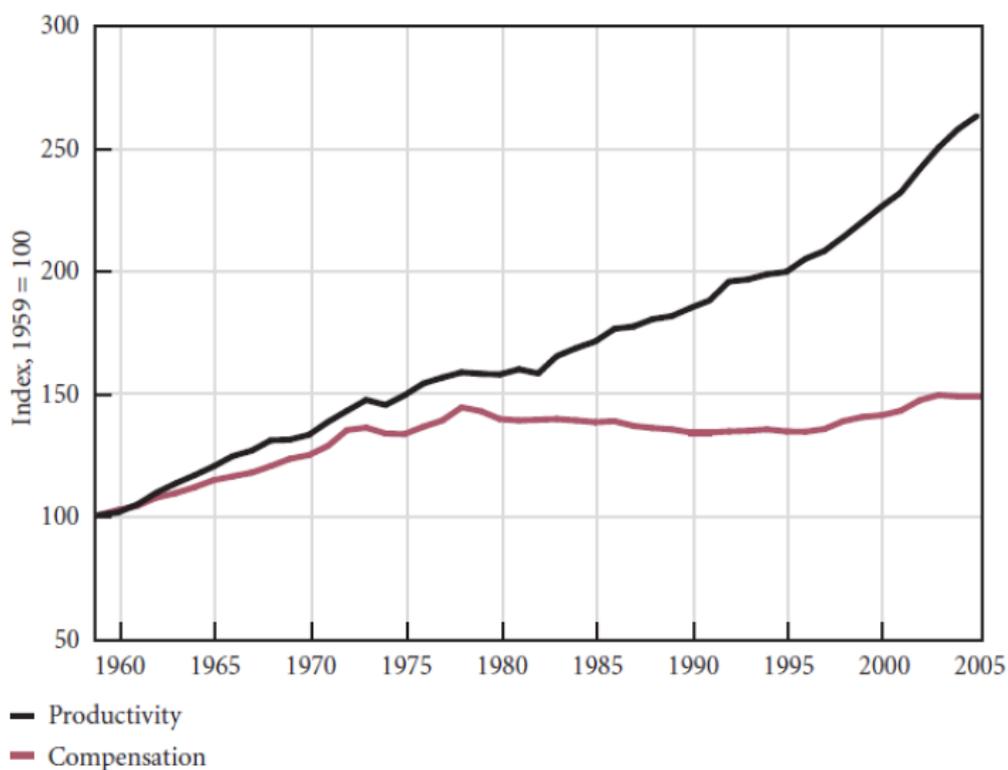


Figure 5.2 Comparison of Labor Productivity Growth and Real Wage Growth, 1959-2005 (1959 = 100)

Source: Setterfield (2010:32).

Firstly, although there are different indicators on the path of wage share because of the chosen variables, interpretations that focus on wage share does not seem robust for several reasons. Setterfield (2010) argues that a constant wage share, by

definition, requires an equality of real wage and productivity growth, relying on the definition that wage share is equal to the ratio of nominal wage multiplied by the level of employment to the nominal output level. Using the variables provided by Setterfield (2010), the wage share can be written as:  $\omega = \frac{W \cdot N}{P \cdot y}$ , where wage share of national income is the ratio of nominal wage (W) times the level of employment (N) to the general price level (P) times aggregate real output. Thus, considering  $W/P$  as the real wage and  $y/N$  as the level of labour productivity, it is clear that this definition implies necessarily a constant wage share in the case of the equality of growth rates of real wage and labour productivity. Nonetheless, such a definition takes all wages (including those of supervisory workers) into consideration. Therefore, when all wages are considered, Setterfield (2010:7) finds that the US wage share has fallen from 82.1 percent in 1979 to 80.3 percent in 2004. Although there exist a fall in wage share, this does not seem as a very sharp decline. In our calculations from National Income and Product Accounts (NIPA) data, we reached a similar conclusion. Compensation of employees as a percentage of GDP displays a declining trend throughout the last four decades, nonetheless it has fallen from 59 percent to 56 percent between 1969 to 2007 (see Figure 5.3). Furthermore, as Dumenil and Levy (2011) aptly put it, the price level indicator matters in the determination of wage share and it is not clear in foregoing interpretations whether they use consumer price index (CPI) and GDP deflator. Since “[t]he purchasing power of wage earners can only be assessed taking account of the prices at which they purchase the goods and the services”, whereas CPI matters for the real wages, GDP deflator matters for labour productivity (Dumenil and Levy, 2011:15). Accordingly, the wage share is the proportion of hourly real wage over labour productivity times the price ratio, which is the ratio of CPI over GDP deflator (Dumenil and Levy, 2011). Therefore, since the price ratio grows 1.5 times from 1960 to 2009, this offsets the negative effect of real wage stagnation and has contributed to keep the wage share stagnated (Dumenil and Levy, 2011).

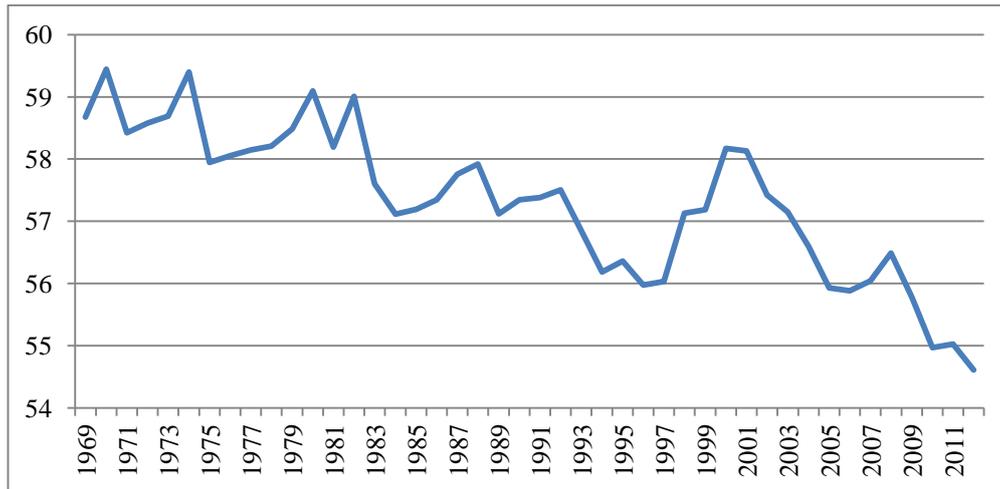
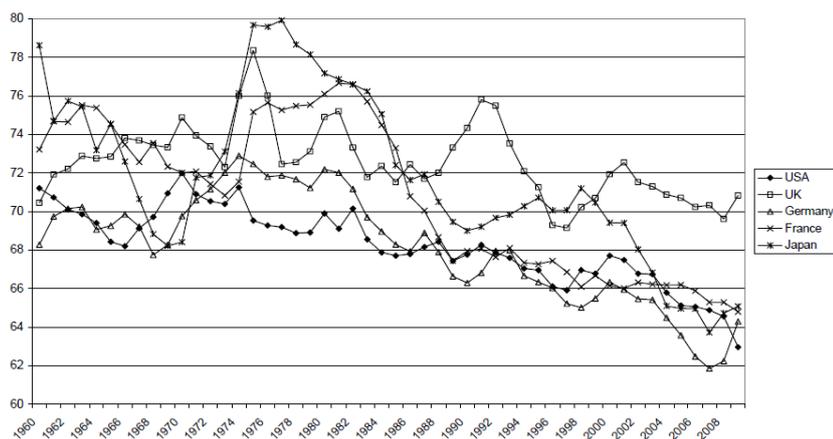


Figure 5.3 Compensation of Employees as a percentage of GDP

Source: Bureau of Economic Analysis, National Income and Product Accounts (NIPA) Section 1 and Section 2.

On the other hand, some of these heterodox interpretations point out that official statistics on wages and salaries includes managerial salaries, so they may be deceptive due to their inclusion of residual earnings. For example, Setterfield (2010:8) claims that “data for total employee compensation may fail to adequately capture the full extent of the aggregate demand problem confronting the US economy”. To eliminate such problems, Stockhammer’s (2012) propositions base on “adjusted wage share” across several countries (see Figure.5.4). Arguing that sharply increasing management remunerations are counted as a part of the wage share, Stockhammer (2012) adjusts wage shares of some major countries by counting management remunerations as distributed profits. Then, he finds a significant decline in adjusted wage share for the US case. However, such adjustments may not be appropriate because the main consideration here is the aggregate demand generation, not the conceptual fallacies in official statistics. If the argument is that there has been inadequate aggregate demand generation due to declining wage share, it should be shown that increasing managerial salaries does not spend in the period when they are generated. However, to the best of my knowledge, there is not any first hand indicator on this point in the interpretations provided by heterodox scholars.



Source: AMECO<sup>3</sup>

Figure 5.4 Adjusted wage share in major economies

Source: Stockhammer (2012).

Notes: Arguing that sharply increasing management remunerations are counted as a part of the wage share, Stockhammer (2012) adjusts wage shares of some countries by counting management remunerations as distributed profits.

Nonetheless, heterodox scholars claim that increasing inequality, mainly as a result of real wage and productivity patterns<sup>154</sup>, may cause inadequate aggregate demand due to the higher marginal propensity of consumption on the part of lower income groups and the majority of wage earners. This can be considered as an indirect supportive argument to the foregoing cases. In the first instance, assuming that marginal propensity to consumption has not changed or became higher for lower income groups; the data on the income inequality supports these arguments (see Figure 5.5). With the starting of the 1980s, there has been a significant rise in the income share of top income groups, especially for the benefit of top five percent and above. Nonetheless, the key to the foregoing arguments is the second part, which

<sup>154</sup>As Setterfield (2010) shows, growing gap of real wage and productivity growth might have determined the deterioration of income distribution significantly. He provides evidence on the different growth rates of income in different quintiles of income groups. He (2010:12) states that “the average annual rates of growth of household income for households in the bottom four quintiles ... are -0.04%, 0.33%, 0.54% and 0.86% respectively” during the periods of 1979-2005, when “Americans families worked longer hours and when real income in the economy as a whole (as measured by real gross domestic product) grew at an average annual rate of 2.96%”.

assumes that lower income groups have a higher propensity to consumption and this has not changed. However, as Dumenil and Levy (2011) aptly puts it, deterioration in income distribution for the benefit of upper income groups has not changed the *overall propensity to spending* in neoliberal period, because average saving rate of households has gradually diminished. This means that “under the very likely assumption that savings were concentrated within upper income strata”, the decline of average saving rate of households to almost zero “points to the fact that the income brackets that were traditionally savers spent more and more” (Dumenil and Levy, 2011:12). Moreover, since both income and spending of upper classes increased substantially, and even the spending of top income groups compensated much more than that of the reduction in consumption of lower income groups, the concentration of income among upper groups did not result in inadequate demand; instead, this phenomenon resulted in consumption boom (Dumenil and Levy, 2011).

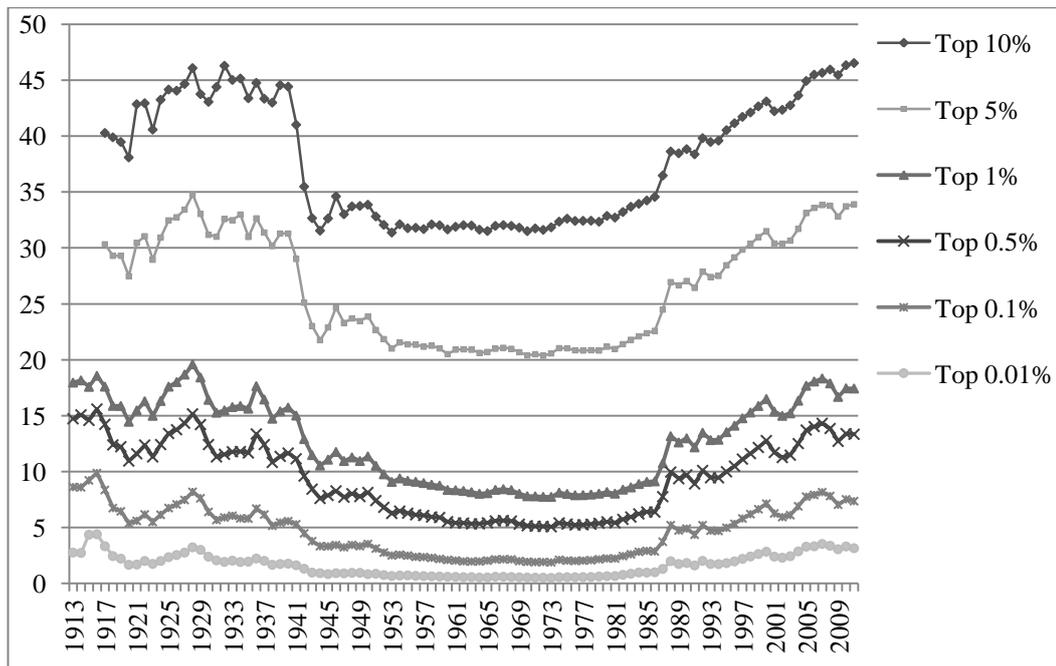


Figure 5.5 Top Income Shares for the US, 1913-2011

Source: The World Top Incomes Database.

Finally, since the main arguments of the foregoing accounts points out a decline in purchasing power of the majority of the households, it should be expected that the share of consumption expenditures in national income (as a percentage of GDP) must have diminished throughout the process. However, as it is fairly clear, the movement of consumption share displays an opposite pattern. Moreover, considering that a part of household income might have been spent for housing, residential investment component of national income should be taken into consideration while analyzing the aggregate demand patterns (see Figure 5.6). Both of these variables displays that there is not any problem with the domestic demand generated by households in the US during the neoliberal period. What is more, the increase in the share of consumption exceeds the level of decline in any types of wage share, whether adjusted or not. Thus, as Dumenil and Levy (2011) aptly put it, deterioration in income distribution actually accompanied with a consumption boom. Indeed, Setterfield (2010) admits that despite the violation of the so-called golden rule, growth rate and unemployment patterns during two decades after 1980 was recovered relative to the 1970s. He (2010: 10) also states that “rather than being replaced by an alternative source of aggregate demand, the importance of consumption spending in the US economy has actually *increased* even as real wages have stagnated”.

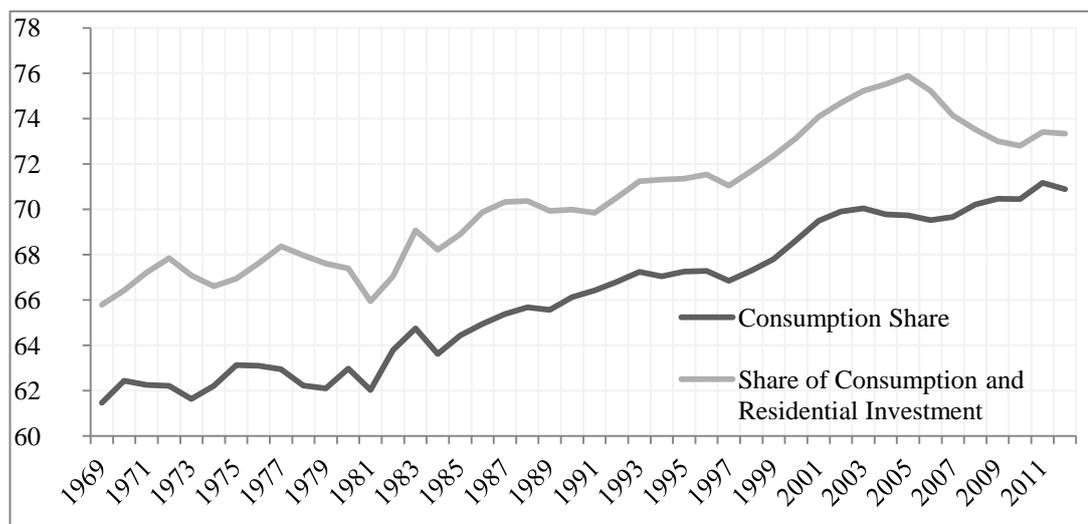


Figure 5.6 Consumption and Residential Investment as a percentage of GDP

Source: Bureau of Economic Analysis, National Income and Product Accounts (NIPA) Section 1, Table 1.1.5.

In conclusion, our discussion over empirical findings shows that interpretations that point out the severance of productivity-wage growth, and consequent declining wage share as the root of structural weaknesses does not seem robust for several reasons. Firstly, although there was a significant severance between real wage and labor productivity growth paths, its effect on the wage share seems very small. This might have been arisen from mainly relative price developments, as Dumenil and Levy (2011) showed. Secondly, although “wage share” calculations comprise of managerial salaries, making an adjustment to exclude them may not be appropriate in our context, because the main consideration here is the aggregate demand generation and there is no reason to assume that managerial salaries did not spend in the year they were generated. In fact, sharply increasing consumption and residential investment shares and declining average saving rate of households in the US show that upper-income groups, including managers, contributed substantially to aggregate demand generation. In this respect, recognizing also that a growing part of the demand was met by imports from other countries, it would be more convenient to evaluate the crisis as a crisis of overconsumption, as Dumenil and Levy (2011) aptly

put it. In short, the crisis does not seem as the result of structural demand weaknesses arisen from the severance of productivity-wage growth, despite its other important consequences.

### **5.1.2. Marxist approaches on wage stagnation and inequality as the root causes of the crisis**

Among the Marxian scholars, some explain the crisis more or less with same structure or emphasizing on the similar indicators, although they are critical to those foregoing views, which I grouped as the views of heterodox economists, at some points. Before going into details of Marxian approaches, main critical points should be noted. Although Palley (2010) sees parallels between his account and certain Marxist accounts (especially, of Kotz (2008) and of Foster and McChesney (2009)), and we agree that there are parallels in these accounts, they are separated from each other severely as they approach to the characteristics of postwar era and the neoliberal shift of the 1980s, and to the capitalism, in general. For example, Palley's (2009, 2010) account bases on the idea that neoliberal growth model was adopted as a mere choice of some policymakers in the 1980s and he does not give any explanation on the reason of this shift<sup>155</sup>. Also, Palley (2009) argues that the economy of the postwar era, which was characterized by the link between productivity and wage growth, created "a virtuous circle of growth", by which rising wages contributed to full employment by providing incentive to invest through robust aggregate demand, and, in turn, investment raised productivity by supporting higher wages<sup>156</sup>. However, Marxist accounts generally point out the contradictions of the postwar growth and attribute the crisis of the 1970s to these contradictions, generally defining it as a structural crisis. In general, they consider neoliberal shift as a response to and an outcome of the stagnation or the structural crisis of the 1970s that arose from the internal conflicts of capitalism, despite the existence of different accounts. Foster and McChesney (2010), in their critics of Palley (2010), state that

---

<sup>155</sup> See Foster and McChesney (2010) for a detailed critic on this matter.

<sup>156</sup> Setterfield (2010) gives a more precise theoretical formulation to this argument.

“[t]he root problem, as we see it, is not neoliberalism but capitalism itself. Neoliberalism (the economics of Hayek, Friedman, etc.) did not emerge as a dark conspiracy to drag capitalism from high growth rates and vibrancy; it became the orthodoxy when the system was in tatters in the 1970s”. Also, Resnick and Wolff (2010), with a reference to the fact that capitalism went into crises in both regulated and deregulated forms, argue that class structure of capitalism has contributed “systematically and repeatedly” to crises. To sum up, although some of the Marxian and non-Marxian heterodox approaches to the crisis have significant similarities in the structure of their accounts, it should be noted that those foregoing Marxian critics aptly put the emphasis on the repeating and systemic nature of crises and endeavor to give an account of the neoliberal shift by connecting it to a structural crisis.

With different theoretical arguments, some of the Marxian scholars point out the problems related with aggregate demand and inequality as the root causes of the crisis. For example, Resnick and Wolff (2010) make a case for the connection between the relative conditions of capitalist and working classes throughout the US history and the crisis. On the other hand, Kotz (2008, 2011) mainly argues that the institutional structure of “neoliberal capitalism” was the underlying factor that set the ground for the crisis, in which the upper hand of capital over labor created tendencies to overproduction crises repeatedly. Moreover, he argues that neoliberal capitalism was the root cause of both the recession and financial crisis as opposed to the idea that financial crisis caused the recession. Particularly, he (2011) argues that it was an asset bubble-driven over-investment crisis regarding to the real sector developments. In addition, Monthly Review (MR) School proposes a distinctive hypothesis of the crisis which is based on the concept of monopoly-finance capital (Foster, 2008; Foster and McChesney, 2009; 2010). This school attributes the crisis to the financialization, which is defined as the shift in the gravity of mature capitalist economies from production to finance as a response to the stagnationist tendencies of mature capitalism arising from over-accumulation of capital. The crisis of financialization is seen as the outcome of the contradictions of a new phase of capitalist development, namely “monopoly-finance capital”, in which financialization is the means of capital to avoid from the stagnationist dynamics of

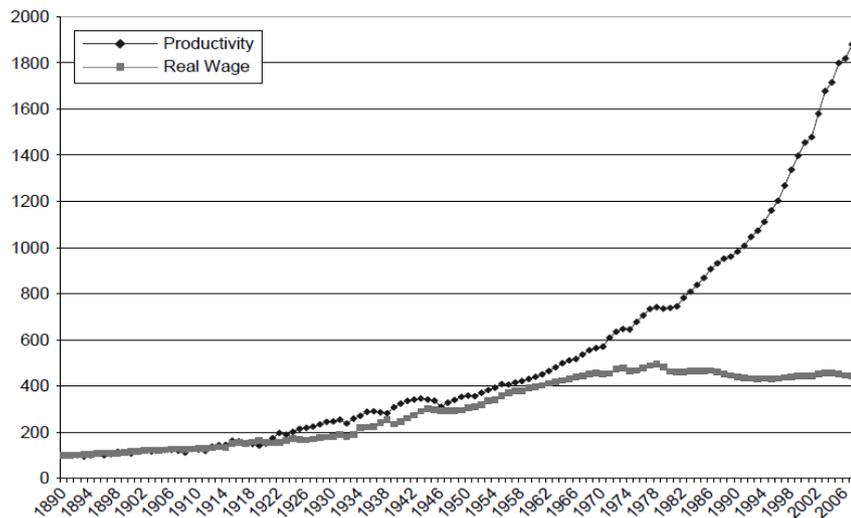
mature capitalism<sup>157</sup>. In this part, we summarize and criticize the fundamentals of these arguments.

The analysis of Resnick and Wolff (2010) solely focuses on the indicator that displays the divergence of the growth of the real wage of workers in manufacturing and the growth of worker's productivity in manufacturing from 1890 to 2007 (see Figure.5.7). They interpret the difference of these variables as a rough indicator of surplus value, referring Marxian value theory. They argue that different class relationships, exploitation and distribution dynamics have prevailed in two distinct periods, one from the 1890s to the 1970s and the other one from the late 1970s to today. In short, they argue that "[t]he genius of U.S. capitalism before the 1970s consisted in the combination of rising real wages, surpluses rising faster, and surplus distributions that reacted back to reinforce the pattern of rising wages and faster-rising surpluses" (Resnick and Wolff, 2010:175). However, according to them, by the late 1970s, under the conditions of rising surpluses and increasing pressure on the distribution of these surpluses, some developments reacted back (including the attack on unions, reduction in taxes and spending, participation of women into labour force, computerization in workplace, immigrations to the US and so on), creating new conditions to the realignment of class relationships. They state that "[c]apitalists' responses to their gains, together with workers' and the state's responses to their losses, eventually converged to become U.S. capitalism's gravest crisis since the

---

<sup>157</sup> We should note that our classification of the arguments of Monthly Review School in this section depends on the observation that they point out similar indicators with the other views analyzed in this section, at first. As we will discuss in the following parts, their indicators, such as rising profit share and declining capacity utilization rate, for the over-accumulation crisis fit well to the characterization of Kotz (2009) who points out these indicators as the illustrators of "underconsumption crisis". Also, even though Foster and McChesney (2010) argue that their accounts cannot be classified as "underconsumptionist" as opposed to such classification of Palley (2010) and they state that "it is the accumulation, or savings-and-investment process, that is the problem", we think that their analysis is closely related with "over-supply" or "lack-of-demand" based theories as opposed to profit based over-accumulation theories. Recapping, our categorization in this chapter mainly depends on the centrality of aggregate demand or profitability in different accounts. Moreover, as Dumenil and Levy (2011:2) aptly state that "[t]he reference to the excess accumulation of capital requires the specification of the variable to which accumulation is compared to be judged too large". Considering that these specific variables are either the level of demand or the level of profits in order to judge that accumulation is excessive, Monthly Review School embrace implicitly the level of demand as its reference, so their arguments fit best to the definition of demand-based overaccumulation theory of crisis.

1930s” (Resnick and Wolff, 2010:179). To sum up, they point out, referring to Marxist theory, the severance of the link of wage-productivity growth as the root of increasing surpluses and declining purchasing powers of the workers after the 1970s. Then, they explain the crisis by linking these developments to financial developments.



**Figure 1** Indexes of Output and Real Wages per Hour, Manufacturing, 1890–2007. Index 1890 = 100.

Figure 5.7 Real Wage and Productivity in the US manufacturing, 1890-2007.

Source: Resnick and Wolff (2010: 177).

Monthly Review school (Foster, 2008; Foster and McChesney, 2009; 2010) argues that stagnation, reflected in rising excess capacity, slow growth and high unemployment, is the normal path of mature capitalist economies in the monopoly-capital phase of capitalism, roughly starting with the late 19<sup>th</sup> century<sup>158</sup>. Based on the argument that capitalism is characterized by an incessant drive to accumulate and with the assumption that “profits grow primarily by increasing the rate of exploitation of labor power –i.e., rise by restraining the growth of wages in relation

<sup>158</sup> See Foster and McChesney (2009) for short information on their approach to phases of capitalist development.

to productivity” (Foster and McChesney, 2009), MR school argues that capital accumulation puts limits on itself through suppressing consumption and eventually investment while “economic surplus” continue to grow. Thus, capitalism needs always new external sources of demand for their growing surpluses, according to this view. On this basis, monopoly capital phase is characterized by the inability of capital to find new profitable outlets for growing surpluses. According to Foster (2008), the reasons for this inability are the maturation of industrial structures, which “no longer needs to be built up from scratch but simply reproduced”; the absence of epoch-making technological developments; growing inequality of income and wealth that depresses consumption demands and investment with the build-up of increasing excess capacity; and growing monopolization that tends to weaken price competition, so the flexibility and dynamism of the system. Thus, MR school indicates growing investment seeking surpluses, suppression of wages and stagnated consumption and investment demand as the main features of the US capitalism. Accordingly, their arguments follow a similar logic to that of others, which emphasize the rise of finance as the main relieving mechanism of stagnationist tendencies, but also as a contradictory mechanism that ends up with a crisis. The difference is that they see those stagnationist tendencies as the basic feature of mature capitalism that started with the late 19<sup>th</sup> century and interrupted only with the emergence of new external sources of demand for growing surpluses.

The accounts of Kotz (2008, 2011) on the causes of the crisis base on a re-conceptualization of “social structures of accumulation” (SSAs) theory. SSA means a particular institutional structure of capitalism. Wolfson and Kotz (2009) reconstruct SSA theory with the idea that different institutional structures that can stabilize class contradictions temporarily, especially between capital and labor, should be defined as distinctive SSAs.<sup>159</sup> The way that this temporary stabilization occurred between

---

<sup>159</sup> Wolfson and Kotz (2009) discuss the features of old SSA theories, which attribute to a new phase the promotion of strong capital accumulation and economic growth. They argue that this does not capture neoliberal era as a distinctive phase since after the 1980s capital accumulation and economic growth have been slow in comparison to the earlier episodes. Their justification bases on the idea that “the rate at which accumulation proceeds in the system as a whole, even given the rate of profit, is highly variable” (Wolfson and Kotz, 2009:8), so the aim of restructuring of institutions is mainly not

capital and labor with direct implications in workplace and indirect implications through the state and institutions, whether capital or labor had the upper hand in this stabilization, lays the foundation for the role of state and the form of institutions under two categories of SSAs: liberal and constrained-market SSAs. These general categories of SSAs differ along several dimensions according to the stance toward labor, the weight of regulations, competition among capital and among workers, the relative independence of financial capital, and dominant ideology. Based on this new conceptualization, they argue that neoliberal capitalism should be seen as a new and coherent institutional structure (a new SSA) regarding to the post-war “constrained-market” SSA that went into a structural crisis in the 1970s. Based on these fundamentals, Wolfson and Kotz (2009) argue that different institutional structures have tended to reveal different problems, so different crisis characteristics. Accordingly, while constrained-market SSAs tend to produce profit-squeeze crisis due to high bargaining power of labor and low level of unemployment; liberal SSAs tend to produce inadequate aggregate demand, overcapacity and financial crises due to capital’s ability to squeeze growth of wages and distribute income in its favor, or due to “coercive investment” arising from intense competition among capitalists, or due to financial deregulation process.<sup>160</sup>

Based on this theoretical background, Kotz (2008) characterizes the crisis as the crisis of “neoliberal capitalism”. Firstly, he (2008) counts the basic features of the neoliberalism in the US: deregulation of business and finance, privatization of many state services, the retreat of the state in active regulation of macroeconomy with targeting only low inflation, reductions in social spending and taxes on business and wealth, attack on trade unions, enabling labor market flexibility, unrestrained competition among large corporations, new competitive-based managerial practices. According to Kotz (2008), this institutional background set the ground for three features of the neoliberal capitalism. These are the growing inequality between

---

establishing rapid accumulation, but stabilizing class conflicts and create an environment to profit-making.

<sup>160</sup> See Kotz (2009, 2011) for empirical supports to these arguments.

wages and profits and among incomes of households; a growing financial sector that has increasingly engaged in risky and speculative activities; and a series of large asset bubbles<sup>161</sup>. For him, although these developments promoted the economic expansion in the neoliberal capitalism, they were contradictory and set the ground for the crisis. It is argued that despite the increasing effect on surplus value, growing inequality between wages and profits and the reduction of taxes and spending by the state creates the conditions for the problem of the realization of surplus value, so inadequate aggregate demand problem. As the last step, he indicates the role of household indebtedness and repeating asset bubbles as the relieving, nonetheless contradictory, mechanisms that resolve the demand problems, but paving the way for the outbreak of a structural crisis. Finally, Kotz (2011), focusing on the boom and bust years of the 2000s, argues that it was particularly an asset-bubble driven over-investment crisis, which is driven by growing inequality and resulting increase in investable funds that exceeds productive investment opportunities in the neoliberal capitalism. The “over-investment” period refers to the build-up of excessive productive capacity according to the normal levels of demand, which are aligned with real income and wealth of society. Thus, a bubble-driven over-investment implies that investment demand and the build-up of productive capacity are driven by wealth effects and optimistic expectations about profits arisen from an asset bubble. Kotz (2011) argues that, with the bust of the housing bubble, since consumption and investment return to normal levels, aligned with real wealth and income, this uncovered the build-up of excessive productive capacity that would depress profit rates for a lengthy period due to the decline in capacity utilization rate.

All in all, foregoing Marxian accounts mainly indicate three phenomena as the signs of inadequate demand or stagnationist tendencies in the US economy: declining purchasing power of the workers, rising surpluses and rising excess capacity in

---

<sup>161</sup> For the first two explanations are straightforward. For the latter one, Kotz (2008) argues that asset bubbles were the result of the first two, so of the whole set of features of neoliberal capitalism. Accordingly, the growing volume of investable funds that have arisen from the growing inequality exceed the available productive investment opportunities, so create favorable conditions for the rise of an asset bubble, which is further fed and developed by the deregulated financial sector that engaged in shortsighted profit-making.

manufacturing sector. For example, Resnick and Wolff (2010) relies on the interpretation derived from the growing gap of real wage and productivity and point out rising surpluses and declining purchasing power of workers. Also, Monthly Review school points out the rising rate of exploitation (measured by productivity – wage gap) and the declining wage and salary disbursements as a percentage of GDP after the 1970s, while the consumption share was rising with the growing household indebtedness. Moreover, Foster (2008) indicates declining manufacturing capacity and net private nonresidential fixed investment as percentage of GDP after the postwar boom (see Figure. 5.8). The latter one is thought as an indicator of capital accumulation among Marxist scholars. Foster (2008) argues that declining rate of capital accumulation in the private sector after the 1970s was not due to the lack of economic investment-seeking surplus, which is evidenced in excessive corporate savings according to him, but due to the declining purchasing power of workers. Finally, Kotz (2008) mainly indicates increasing surplus value during the last four decades, but the potential problem of realization of surplus value due to wage stagnation.

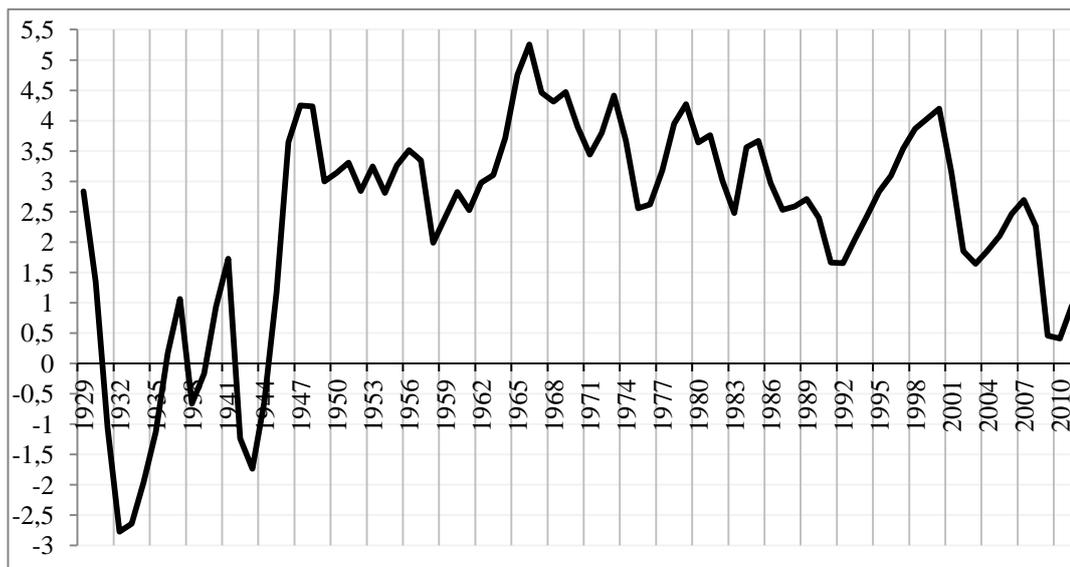


Figure 5.8 Net Private Nonresidential Fixed Investment as a percentage of Net Private Nonresidential Fixed Assets, US, 1929-2011

Source: Bureau of Economic Analysis, National Income and Product Accounts, Table 1.1 “Current-Cost Net Stock of Fixed Assets and Consumer Durable Goods (yearend estimates)”, Table 5.2.5 “Gross and Net Domestic Investment by Major Type”.

As we have already shown in the previous part, the evidence on the inadequate aggregate demand arisen from declining purchasing power of the workers is not supportive for these Marxian arguments. Ever-increasing consumption share is in dispute with alleged ‘inadequate aggregate demand’ and developments in the relative price of consumption goods and services to total output prices are in dispute with alleged ‘deficient purchasing power of workers’. These mean that there might not have been any realization problem during the neoliberal era. Moreover, although growing gap of real wage and productivity can be interpreted as an indicator of growing surplus value in Marxian terms, it is not the only determinant of profit rate, which is considered as the main driver of capital accumulation and investments. As we will discuss in the subsequent parts, technological determinants of profits and distributional aspects of surplus value among capitalists should be considered too, while interpreting the direction of profit rate.

Now we turn to the specific arguments of MR school. We argue that declining trend of net non-residential fixed investment, i.e. declining rate of capital accumulation, most probably reflect changing supply-side factors or the path of profit rates in the long-run. The arguments of Foster (2008) rely on increasing corporate savings. He (2008) states that the “failure to invest is clearly not due to a lack of investment-seeking surplus. One indicator of this is that corporations are now sitting on a mountain of cash—in excess of \$600 billion in corporate savings that have built up at the same time that investment has been declining due to a lack of profitable outlets.” What he means exactly with excess corporate savings is not clear, but possibly it should be net financial position (undistributed profits minus capital spending) of the corporate sector. In an earlier work presented in the IMF’s World Economic Outlook (IMF, 2006b hereafter), this excess saving position of corporate sector in G-7 countries is discussed in detail. However, considering only the US case, the findings of this study do not support the view of MR school considering the fundamental points.

At first, IMF (2006b) study shows that non-financial corporate sector (NFCS) of the US became a net lender after the mid-1980s; with a short break during the second half of the 1990s<sup>162</sup>. This phenomenon can be seen in the left-hand panel of Figure 5.9. When we look at the left-hand panel, it seems that two sharp declines in capital spending after the mid-1980s and after 2000 are supportive for the arguments of MR school, except for the information technology boom period in the 1990s. Moreover, the same panel also shows that there has been a rise in undistributed profits as a percentage of GDP after the mid-1970s, despite a stable trend with some fluctuations in the late phases. However, the right-hand panel discredits the arguments of MR school partly. Gross operating surplus, which represents the ratio of “total income minus labour compensation minus production taxes” to GDP in this study, is the

---

<sup>162</sup> Net financial position of NFCS is calculated as the undistributed profits (gross saving) minus capital spending. Undistributed profits (gross saving) are the remaining profits after dividend payments, all taxes and net interest payments subtracted from gross operating surplus. In the IMF (2006b), every ratio is considered in “gross” terms and as a percentage of GDP. However, in Marxist works, in general, all these ratios are considered in “net” terms.

closest variable to “surplus value” definition of Marxist school<sup>163</sup>. As opposed to the arguments of MR school, i.e. “investment-seeking surplus increased” primarily because of stagnated real wages after the 1970s, this figure does not display any sign of increasing trend of “investment-seeking surplus” during the recent period.

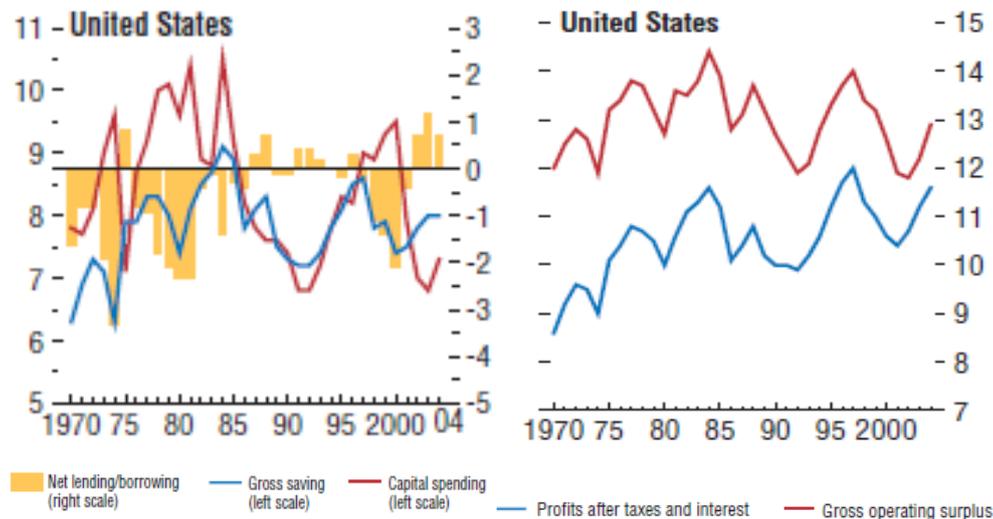


Figure 5.9 US Nonfinancial Corporate Sector Gross Saving, Capital Spending, Net Lending/ Borrowing, Gross Operating Surplus and After-tax, after-interest payments Profits (as a percentage of GDP)

Source: IMF (2006b: 140-142).

Nevertheless, what has driven the excess of undistributed profits (gross saving) over capital spending is still important for the verification of MR school’s arguments. Has it really been driven by inadequate aggregate demand? Firstly, IMF (2006b) shows that the increase in undistributed profits of NFCS was mainly driven by declining net interest payments and taxes for the US, not by gross operating surplus, despite ever-increasing net dividend payments. This further puts caveat on the idea of “ever-increasing investment-seeking surplus driven by stagnated real

<sup>163</sup> However, labour compensation captures all labour, not the productive labor only, the denominator is not the capital stock and every variable is in gross terms.

wages”. Secondly, it shows that improving net financial position of the NFCS reflects mostly declining capital spending after 2000. According to this study, both short-term developments and long-term structural developments explain this phenomenon. For the short-term, it is pointed out that high-leveraged position of corporate sector during the 1990s depressed investment substantially in the early 2000s, when firms’ net worth was declined and they were directed to repay their debt (IMF, 2006b). For the long-term, it is pointed out that long-term downward trend in the relative price of capital goods might have shown investment expenditures less in nominal terms (IMF 2006b). Nonetheless, IMF (2006b) points out also the fall in real investment of the US corporate sector in the early 2000s. However, it proposes that this might have been resulted from relatively higher indebtedness of the US NFCS. Although long-term structural factors might have been influential on this fall, IMF (2006b) states that real investment level bounced back the level of 2000 in 2004. Thirdly, IMF (2006b:146) points out that US NFCS “has been accumulating substantial amounts of equity in recent years.” According to IMF (2006b), this reflects both share repurchasing in the homeland and purchasing of equities from the rest of the world, including the purchases from emerging market economies especially. The latter evidence implies that weakness of domestic capital spending in the US was also partly driven by the orientation of the US NFCS toward financial overseas investments alongside other causes. IMF (2006b:147) states that “if net direct investment abroad by nonfinancial corporations is added to their domestic capital spending, nominal total NFCS capital spending in 2004 is broadly at the same level as in the late 1990s.” Finally, IMF (2006b) draws attention to increasing cash accumulation of NFCS after the 2000s. According to this study, this might have been driven by high profitability in some sectors (especially in information technology and resources sectors), higher volatility of sales in an uncertain environment and increasing share of intangible assets in corporate balance-sheets. As a result, although some of these do not directly refute the general idea of “stagnation” arisen from overaccumulation in mature economies and some of these facts even may be compatible with the thesis of MR school in some sense, it seems that there is not any indication of that inadequate aggregate demand has driven capital spending and

investment downward, so excess corporate saving has emerged. As shown above, the reality is more complicated than this theory offered.

Beside this study, findings of Dumenil and Levy (2011) are also in conflict with the arguments of MR school. As aptly put by them, if Marxists point out the deterministic relationship between the rate of accumulation and profit rates, the closest measure of profit rates to the rate of accumulation should be primarily taken into consideration. They show that “the rate of retained profits” (undistributed profits, net corporate savings) is the one that tightly match the patterns of the rate of accumulation, i.e. the net fixed investment as a percentage of fixed capital at current prices (see Figure.5.10). After the specification of the relevant variable, Dumenil and Levy (2011:30-31) puts their main argument: “the rate of retained profits determines the rate of accumulation, as investment is approximately self-financed. More specifically, once taxes and interest have been paid, corporations “arbitrate” between two possible uses of profits, distribution as dividends or the self-financing of investment. Our view is that the rules inherent in neoliberal corporate governance caused a shift in favor of dividends flows and to the detriment of investment.” This argument is directly opposite of that of MR school, who offers that since investment opportunities has weakened in mature capitalism due to mainly insufficient demand, there reveals excess corporate saving or they distribute those after-tax, after-interest profits to shareholders or gravitate towards financial investments. The discussion here is whether those “excess profits” distributed among shareholders or held in cash or invested in financial claims have just reflected residuals after firms made their investment decisions or they have been shaped by other concerns of corporate sector. Dumenil and Levy (2011) support their main argument with a figure that shows a sharp bouncing in dividends paid out to shareholders after 1980 (see Figure 5.11). They interpret this sudden change as an indicator of the change in corporate governance with neoliberalism. They state that “[i]f the new trends in the distribution of dividends, proper to neoliberalism, had been established as a consequence of deficient demand levels, *the transformation would have been gradual*, not sudden” (Dumenil and Levy, 2011: 32, emphasis in original). As a result, both studies we have covered thus far show that the slowing rate of accumulation does not reflect the

lack of investment opportunities, but it might have been driven by balance-sheet considerations, changing strategies of corporations during neoliberal globalization, other structural factors or short-term concerns.

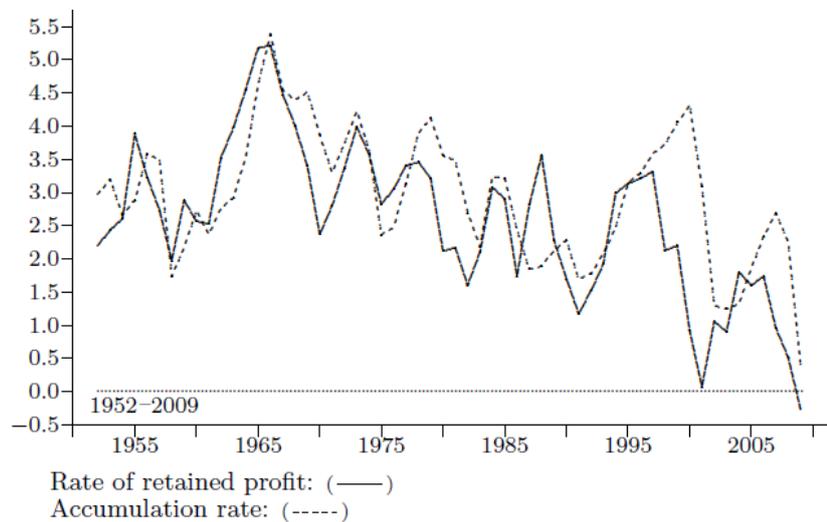
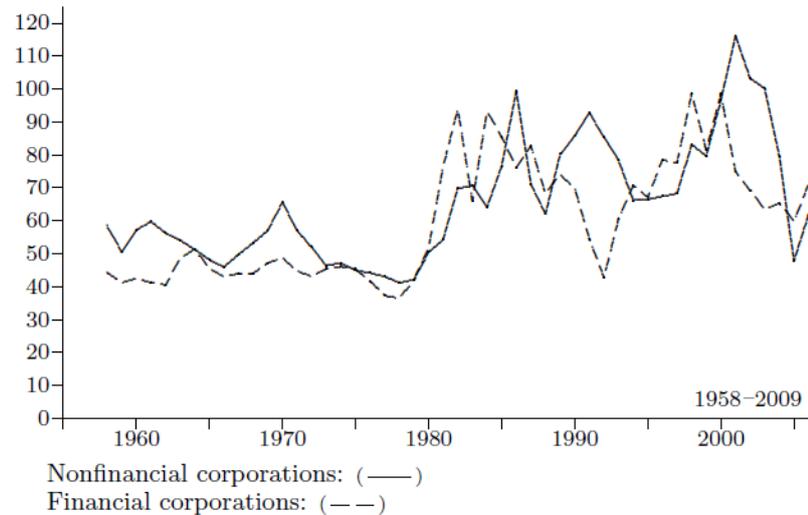


Figure 5.10 The rate of accumulation and the rate of retained profits (undistributed profits) for the US non-financial corporate sector, 1952-2009

Source: Dumenil and Levy (2011: 25)

Note: “The tight correlation between the two variables mirrors the self-financing of investment by corporations.” (Dumenil and Levy, 2011: 24).



Net interest paid are also subtracted from profits.

Figure 5.11 Share of dividends in after-tax profits in the US financial and non-financial corporate sectors, 1958-2009

Source: Dumenil and Levy (2011: 32).

Nonetheless, as pointed by some Marxists, and also by some heterodox scholars, capacity utilization rate displays a declining trend during the last four decades (see Figure.5.12). In general, it is argued that this downward trend of the capacity utilization rate reflects inadequate level of aggregate demand in the long-run due to the wage stagnation and some other consequences of neoliberal macroeconomic policies. However, Dumenil and Levy (2012a) question this argument in a short note and argues that “assessing the levels of the capacity utilization rates during the latter decades in comparison with a “norm” defined in reference to the first decades after World War II is misleading”. They provide two measures of the trend of the capacity utilization rate in their work. According to the assumption of constant trend of capacity utilization rate, which is considered as the average values for the period between 1948 and 1973, it may be argued that there is a long-run tendency of depressed activity in US manufacturing sector after the 1970s. However, as it is admitted in many accounts, the 1990s and the 2000s cannot be seen as the years of depressed activity or stagnation. For their alternative measure, Dumenil and Levy (2012a) consider the trend of the capacity utilization rate as sloping downward after

the 1970s and argue that this is a more plausible indicator in order to assess the developments of the last four decades in comparison to a constant trend assumption. The fluctuations of actual capacity utilization rate according to two different trend measures can be seen in Figure 5.13 below. Although the evidence on the capacity utilization rate seems supporting the foregoing arguments of the heterodox and Marxist scholars, when we assume that there was a downward trend of the capacity utilization rate, which have resulted from, say, supply-side factors, but not from inadequate aggregate demand, there seems not any exclusive or distinctive contribution of demand-side factors in the path of capacity utilization rate. This can be confirmed by Figure.5.13, on which fluctuations –that reflect changes in demand-side factors- around a declining trend does not display any distinctive characteristics relative to postwar period. In conclusion, the critics of Dumenil and Levy (2012a) on the interpretation of the long-term trends cast doubt on the validity of the assumption of constant long-run trend of capacity utilization for the recent decades and the interpretations that hinges on this assumption.

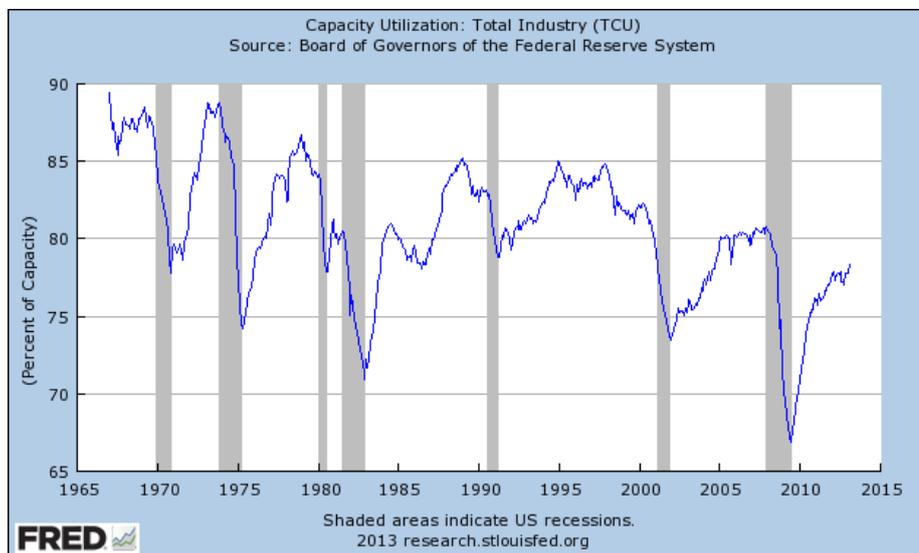


Figure 5.12 Capacity Utilization Rate in the US, 1967-2012

Source: Federal Reserve Bank of St. Louis

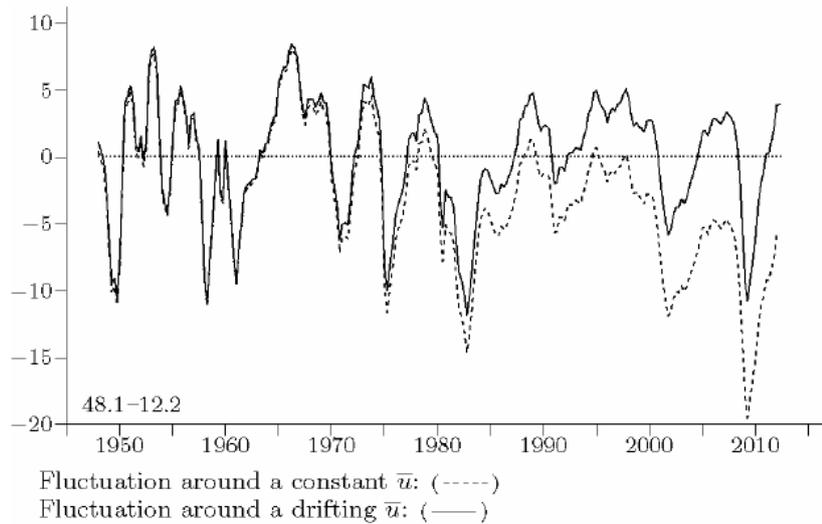


Figure 5.13 Fluctuations of actual capacity utilization rate according to two different trend measures

Source: Dumenil and Levy (2012a).

All in all, foregoing Marxian accounts mainly indicate three phenomena as the signs of inadequate demand or stagnationist tendencies in the US economy: declining purchasing power of the workers, rising surpluses that could not find investment outlets, thereby declining rate of accumulation and rising excess capacity in manufacturing sector. Simply recapping, declining purchasing power of workers and inadequate demand does not reflect the recent phenomena we observed in the US. All those developments highlighted by both heterodox scholars and Marxists imply significant structural changes for the US economy. As a result of them, relative conditions of workers might have been deteriorated, income distribution might have worsened, and manufacturing sector of the US might have been weakened, resulting in high unemployment and poverty in some areas of the country. However, all of these developments do not necessarily bring about weakness in demand generation and as we have shown, there seems no weakness in demand generation. Instead, there has been excessive consumption demand throughout the neoliberal period and it has been witnessed excessive investment waves in information technology and housing during the 1990s and 2000s, respectively. Moreover, it seems that excess

capacity in manufacturing and weak capital accumulation might have reflected mostly supply-side developments, changing investment strategies of corporations during the neoliberal globalization, distributional aspects or other short-term concerns about balance-sheets or volatility in sales.

Although we think that all those Marxian and non-Marxian approaches indicate important structural vulnerabilities in the US economy, the way their arguments followed seems not robust and the basic evidence we provided above do not seem as supportive to their arguments. Nevertheless, some part of the arguments of Kotz (2009, 2011) point out short-term (or medium-term, more precisely 5-10 years) developments in demand. Although we find weaknesses in demand-based arguments considering the long-run, these ideas might have been insightful considering the short-run developments.

Recapping, the second main argument of Kotz (2011) is that “both real and financial sector crises stemmed from the same underlying causes”, those foregoing three outcomes of the features of neoliberal capitalism. In order to prove this hypothesis, Kotz (2011) analyzes the movement of the profit rate during the late phase of the business cycle between 2002 and 2007. The short-term profit rate analysis mainly reveals the effect of demand-side factors on the profit rate. The framework of and the intuition behind this type of short-term profit rate analysis is given by Kotz (2009, 2011), who justifies his analysis by stating that “[i]n the typical economic expansion, the rate of profit reaches a peak and then declines prior to the crisis” (Kotz, 2009: 178). Indeed, Kotz (2009) finds that profit rate starts to decline in the late phases of almost all business cycles of the postwar era (see Figure 5.14). Therefore, he mainly focuses on the decomposition of the profit rate into its driving forces in order to test different hypotheses for the crises<sup>164</sup>.

---

<sup>164</sup> Kotz (2009, 2011) uses a narrow definition of profit rate, which is the ratio of after-tax, after interest payments profits of nonfinancial corporate business sector to the net worth of them at market value. His (2011) decomposition of the rate of profit is as follows:  $r = \frac{R}{NW} = \frac{R}{Y} \times \frac{Y}{TA} \times \frac{TA}{NW}$ , where  $r$  is the profit rate,  $R$  is the after-tax, after-interest profit,  $NW$  is the net worth,  $Y$  is the net output or income  $TA$  is tangible assets; and  $R/Y$  is the profit share, and  $Y/TA$  mainly indicates the changes in the capacity utilization of the stock of means of production (since the analysis focus on the short-term fluctuations of profit rate, Kotz (2009) argues that this ratio mainly indicates capacity utilization,



Figure 13.1 The after-tax rate of profit of the nonfinancial corporate business sector in relation to business cycle expansions and contractions, 1949–2005 (source: US Bureau of Economic Analysis, 2006, Table 1.14; US Federal Reserve System, 2006, Flow of Funds, Z.1 Statistical Release).

Key  
 Solid vertical line indicates last year of business expansion. Dotted vertical line indicates recession year. Arrow indicates peak of profit rate prior to its decline in late expansion.

Figure 5.14 The path of profit rate in the US, 1949-2005, by David M. Kotz.

Source: Kotz (2009: 182).

Notes: With the same methodology and measures of variables here, Kotz (2011) calculates profit rates (after-tax, after-interest payments rate of profit as a percentage of net worth for the US non-financial corporate business sector) for the 1996-2009 periods. Respectively, profit rates were 4.74 in 2004; 4.58 in 2005; 4.54 in 2006; 3.57 in 2007; 2.94 in 2008 and 3.21 in 2009.

Kotz (2009) argues that neoliberal form of capitalism produces over-production crises (overproduction relative to demand) in general due to its general

---

while it is also affected by the changes in the organic composition of capital in the long run). Finally, Kotz (2009, 2011) decomposes profit share into wage share, tax share and interest share components:  $\frac{R}{Y} = 1 - \frac{W}{Y} - \frac{T}{Y} - \frac{i}{Y}$ ; and he (2009) decomposes wage share in the following way:  $\frac{W}{Y} = \frac{w_R \times (CPI/P_Y)}{Y_R/N}$  where  $w_R$  is real wage per worker deflated by  $CPI$ ;  $CPI/P_Y$  is the price ratio, in which  $CPI$  is the consumer price index and  $P_Y$  is the output price index,  $Y_R/N$  is the real output per worker, a measure of labor productivity, in which  $Y_R$  is the real output deflated by  $P_Y$  and  $N$  is the workers.

characteristics as an SSA<sup>165</sup>. He raises the possibility of three types of over-production crisis tendency in the neoliberal capitalism. Firstly, “underconsumption” crisis may occur under the conditions that real wages stagnates while labor productivity rises, creating a realization, so inadequate aggregate demand problem unless unproductive spending (such as state spending or capitalists’ consumption) increases enough to offset the lack of demand. This tendency would be identifiable if the profit share in income increases (reflecting underconsumption) and capacity utilization rate (reflecting demand shortfall) falls faster enough to offset the positive effect of increasing profit share during the late phase of a business cycle, in which the rate of profit declines. Secondly, “over-investment” crisis, which is defined as the case of excessive production of fixed capital relative to demand in the economy, may occur due to aggressive competition among large corporations to raise their market share. Competition may lead to creation of excessive productive capacity relative to aggregate demand, resulting in the decline of capacity utilization, which drives profit rates downward in the late phase. This tendency would be identifiable if capacity utilization declines (reflecting demand shortfall arisen from over-investment) and profit share declines due to increasing wage share with the increase in price ratio (CPI over GDP deflator), reflecting the inability of increasing output prices in a competitive environment, which offsets the opposite effect of the growing gap of real wage - labor productivity growth. Thirdly, “an asset bubble-driven over-investment” may occur in the case of the presence of an asset bubble, which is driven by growing inequality and resulting increase of investable funds that exceeds productive investment opportunities in the neoliberal capitalism, according to Kotz (2009, 2011). With the investment of these funds in financial assets, asset prices start to rise, creating a rise in paper wealth, so driving consumption and investment through wealth channel effects and optimistic expectations about future profits. This situation may create over-investment as productive capacity increases faster than demand. With the break of the asset bubble, since consumption and investment return to normal levels, aligned with real wealth and income, this may create excessive

---

<sup>165</sup> This paragraph summarizes the propositions of Kotz (2009).

productive capacity that depress profit rates for a lengthy period. This tendency would be identifiable with the same indicators of competition-driven over-investment model in addition the presence of an asset bubble during the business cycle and a prolonged decline in investment after the collapse of it.

Based on this framework, Kotz (2009) finds that two earlier crises of neoliberal era (of 1991 and 2001 in the US) fit the characteristics of over-investment and asset-bubble driven over-investment crisis, respectively. It was so, because two periods witnessed declining capacity utilization and declining profit share due to increasing wage share that completely were driven by price ratio despite the growing gap of real wage - labor productivity growth.

With a similar analysis, Kotz (2011) makes a case for an asset-bubble driven over-investment crisis for the recent period. He counts following observations from the 2002-2007 periods that would confirm this proposal. Firstly, this period witnessed a housing bubble and its burst triggered the recession. Secondly, focusing on an elaborative analysis of the components of the aggregate demand, Kotz (2011) argues that consumption was above the “normal” level, considering the historical pattern of consumption to disposable income ratio<sup>166</sup>. Also, he shows that consumption growth led to the expansion of the economy after 2002 despite the general pattern of the leading role of business fixed investment (BFI) in the beginning of an expansion. Then, BFI started to a very rapid growth which lasted until 2008 (Kotz, 2011). Finally, Kotz (2011) shows that consumption declines rapidly with the burst of the bubble and again before the decline in BFI, with the fall of consumption to disposable income and bringing about historically very low level

---

<sup>166</sup> Kotz supports this argument with these findings: “[d]uring 2000-07 GDP grew at the rate of 2.32% per year, disposable personal income grew by 2.66% per year, while consumption grew by 2.94% per year (US Bureau of Economic Analysis, 2008). Thus, the long expansion of 2000-07 was driven by consumer spending that rose more rapidly than GDP, rising from 68.7% of GDP in 2000 to 70.3% in 2007” (Kotz, 2008:10). Furthermore, he argues that consumption exceeded disposable income through equity extraction from housing: “[i]n 2002 such equity extractions leaped up to equal about 8% of disposable personal income, and from 2004-06 they were in the range of 9-10% of disposable personal income.” (Kotz, 2008: 10). In the figure he used, gross equity extracted as a percentage of disposable income fluctuated between 2-3% between 1991 and 1997, then rising to the 4-6% interval for the 1998-2001 periods.

of capacity utilization<sup>167</sup>. In addition, Kotz (2011) investigates the drivers of the profit rate movement for the late phase of the cycle. Accordingly, he finds that the profit rate declines mainly due to the decline in the rate of capacity utilization, which explains over 70 percent of the profit rate decline. Furthermore, he shows that the profit share also declined, accounting for over 20 percent of the profit rate decline, but not as the reflection of increasing wage share, which declined in the 2004-2007 periods with the growing gap of wage-productivity and a small rise in price ratio that did not offset the effect of the gap<sup>168</sup>. The fall of profit share is associated with the increasing tax share and interest payments share in Kotz (2011)'s findings, but he does not indicate any reason for this interesting phenomenon. As a result, although declining wage share and capacity utilization seems as supportive to "underconsumption" crisis view, since this type of crisis is linked with rapid decline and recovery in investment and with increasing share of profits during the last phase of cycle, it does not fit the recent crisis. Thus, considering the existence of a bubble, a relatively long decline in investment activities after the crisis hit, and compatibility of all indicators, Kotz (2011) argues that these findings confirm the argument of asset-bubble driven over-investment during the 2000s and that neoliberal capitalism laid the ground for these developments.

Assuming that demand-side factors would be more effective on the short-run fluctuations in profit rate and capital accumulation, the foregoing arguments of Kotz may be very insightful in understanding the real-side of the recent recession. During the recent asset price bubble, wealth effect of the bubble and optimistic expectations about future profits might have been very influential on consumption and investment demand, creating excesses in both of them during the boom and bringing about

---

<sup>167</sup> Based on the finding about that the ratio of consumption to disposable income fell to a level of the beginning of the 1990s, Kotz (2011: 13) emphasizes that "[f]ifteen years of consumption rising relative to disposable income had been reversed. This process was not a consequence of the condition of the banks limiting their ability to make loans resulting from the financial crisis -- it stemmed from the effects of the collapse of bubble-driven growth on the real sector."

<sup>168</sup> "During 2004-07, the average real wage of all employees in the nonfinancial corporate business sector declined at an annual rate of 0.20% per year while real output per worker rose by 1.25% per year" (Kotz, 2011: 32). "For the period 2004-07 that price ratio did rise but not very rapidly -- at a 0.63% annual rate. Over-investment was manifested in a decline in output (relative to capacity) rather than price weakness in the 2000s" (Kotz, 2011:33).

excess capacity in manufacturing and sharp decline in consumption when the bubble burst. We will discuss this point below with the help of critics. Before the discussion, we should draw attention to an important point. The earlier analysis of Kotz (2009) that was relied on the schema above provides further evidence that confirms our conclusions with regard to long-run, and unfortunately weakens his general arguments about the long-run causes of the crisis. He finds that the earlier crises of neoliberal era fit also the characteristics of “over-investment” crisis and “asset-bubble-driven over-investment” crisis, respectively, although he indicates inadequate aggregate demand and the problem of realization of surplus value as the tendencies arisen from the severance of productivity-wage growth. Furthermore, he finds that two earlier cycles of the neoliberal period witnessed declining capacity utilization and declining profit share due to increasing wage share, which is completely driven by the price ratio despite the growing gap of real wage - labor productivity growth. This is exactly what we indicated in the foregoing discussion, relying on Dumenil and Levy (2011). The changes in the price ratio can be favorable to the improvement of wage share and can be enough to offset the worsening real wage conditions, creating a more or less stable wage share in GDP. What is more, although Kotz (2009) interpret the movement of the price ratio as a consequence of competition and considering the short-run developments, it may be considered as a result of long-term changes in the organic composition of capital, i.e. technological developments depress the prices of capital goods especially. Interestingly, while Kotz (2009) finds that wage share increased mainly driven by changing price ratio in two earlier cycles of the neoliberal period, however, he (2011) does not significant effect of the price ratio during 2004-2007 periods<sup>169</sup>. On the other hand, Basu and Vasudevan (2012) point out a significant change in the relative price of capital goods after 2004 as a consequence of changing structural factors. Moreover, Basu and Vasudevan (2012) take into consideration the effect of the price ratio on capital productivity trends and

---

<sup>169</sup> “For the period 2004-07 that price ratio did rise but not very rapidly -- at a 0.63% annual rate. Over-investment was manifested in a decline in output (relative to capacity) rather than price weakness in the 2000s. In the two earlier late expansions of the neoliberal era in the late 1980s and late 1990s, Kotz (2009) found a rapid rate of increase in this price ratio (1.9% per year) to be an important source of the late-expansion profit rate decline” (Kotz, 2011: 33).

propose more suggestive explanation for the recent trends. This issue will be discussed in a more detailed way with the findings of Basu and Vasudevan (2012) in the following pages. However, this discussion implies that focusing on short-run determinants of profit rates may not be enough to draw robust conclusions. Nonetheless, what is clear from Kotz (2009, 2011) is that wage share and price ratio patterns do not seem supportive for the general arguments of deficient purchasing power of workers, realization problem or inadequate aggregate demand.

Considering the findings of Kotz (2011) on the short-term developments, we can point out two critical positions against them. Firstly, the general argument of MR school implies the lack of investment before the crisis. Also, from a different perspective, Lapavitsas (2010) argues more explicitly that the recent boom period have witnessed stable consumption share and falling investment in the US. These arguments are in dispute with “over-investment” concept of Kotz (2011). However, both figures we provide below, Figure 5.15 and Figure 5.16, show that there was a rise in the share of gross private fixed investment as a percentage of GDP and net private fixed investment as a percentage of fixed assets after 2003. Moreover, the second one shows that despite the existence of housing boom, net non-residential fixed investment has rapidly risen between 2003 and 2007. It also shows that the boom in residential investment ended up in 2005, while non-residential fixed investment lasted until 2007. These figures seem as supportive for the arguments of Kotz (2009). Moreover, the concept of “over-investment” refers to a hypothetic level of “normal”, which is determined by only real factors without considering any contribution of financial developments. So, the argument here is that financial developments, such as a housing bubble, drives consumption, thence investment, above “normal” and creates “excesses” in investment. Hence, the explanation of Kotz (2011) on the determinants of the deepness of recession, not the financial crisis, seems valid considering only these figures and conceptual clarification.

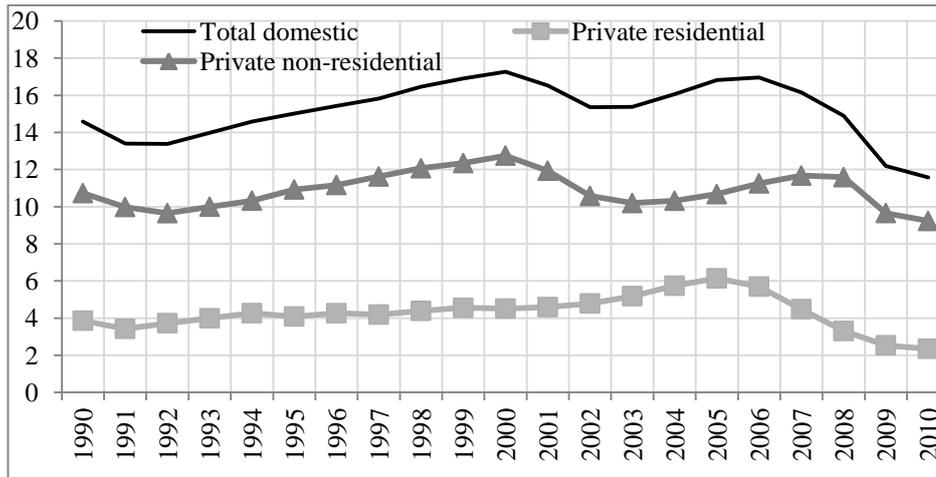


Figure 5.15 Gross Private Domestic Fixed Investment Share (as a percentage of GDP), 1990-2010

Source: Bureau of Economic Analysis, National Income and Product Accounts, Table 1.1.5.

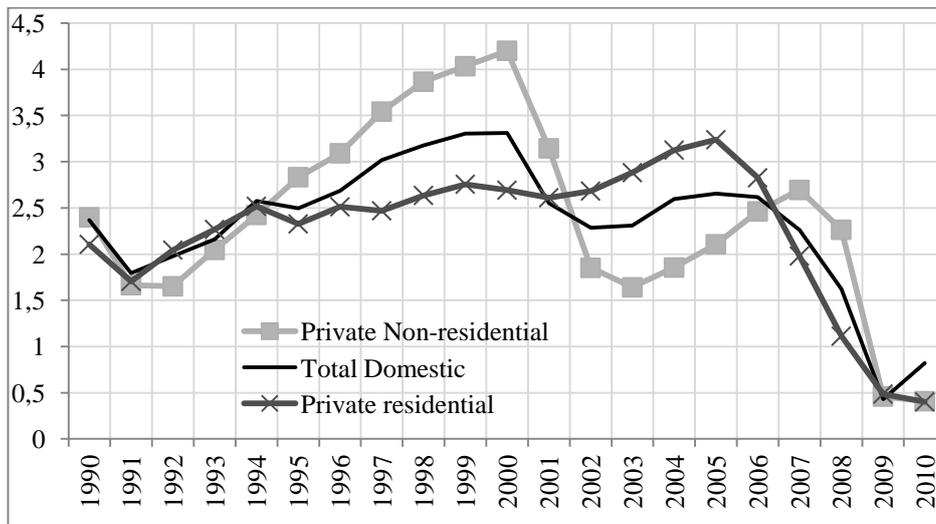


Figure 5.16 Net Private Fixed Investment as a percentage of Net Private Fixed Assets, US, 1990-2010

Source: Bureau of Economic Analysis, National Income and Product Accounts, Table 1.1 “Current-Cost Net Stock of Fixed Assets and Consumer Durable Goods (yearend estimates)”, Table 5.2.5 “Gross and Net Domestic Investment by Major Type”.

Nonetheless, the causality between profit rate and demand-side developments, say capacity utilization rate, can be two-sided in the short-run (Dumenil and Levy, 2011). This means that as opposed to Kotz (2011)'s findings, declining profit rate might have caused the fall in capacity utilization rate partly. To determine the relationship, Dumenil and Levy (2011) compare the peaks and troughs in profit rates and in output from 1947 to 2010, taking logarithm of variables and taking out their trends. The picture displays the existence of high correlation between fluctuations of output and profit rate, but also leading position of profit rates in some instances. Nonetheless, as admitted by Dumenil and Levy (2011), this is not enough to draw conclusion about causality. Thus, this does not make the arguments of Kotz (2009, 2011) invalid, but it just puts some caveats on them. However, the very same figure of Dumenil and Levy (2011) shows that profit rate fluctuations in the recent crisis do not display unexceptional amplitudes during both boom and bust periods. Thus, they argue that "[t]he hypothesis that these fluctuations caused a major recession appears very questionable" (Dumenil and Levy, 2011: 43). As a result, agreeing with the last point of Dumenil and Levy (2011), the short-run developments (demand-side factors) does not seem as being able to fully capture the deepness of the recession. Nonetheless, detailed interpretation of Kotz (2011) on timing of the changes in consumption and investment growth patterns and his emphasis on the effect of financial processes over demand patterns, thence recession is able to capture some of the important phenomena of the recent crisis.

### **5.1.3. The link between inequality, aggregate demand problems and financial excesses**

In the second step of the foregoing arguments, heterodox scholars and Marxists consider the rise of finance, indebtedness or asset bubbles as counterbalancing mechanisms against the problems related with inequality and aggregate demand. In most of these accounts, it is argued that growing household indebtedness was a response to the worsening income condition of households. In some accounts, growing surpluses of firms and incomes of the wealthiest part of the society are pointed out as the source of funds that have fed the asset bubbles and indebtedness. In

general, two ways of relationship (or mechanisms) between increasing inequality and the recent crisis are proposed by heterodox and Marxian scholars. Mainly, it is argued that rising inequality contributed to both increasing household debt due to relatively worsening conditions of the majority of households and to the speculative use of wealth due to increasing wealth accumulated by top income groups.

For the first relationship, Setterfield (2010:18) clearly states that “an unsustainable pattern of debt accumulation by lower and middle income households, seeking to offset weak real income growth caused by the failure of the real wages to keep pace with productivity growth” became the root of “the latent fragility of the US economy [that] finally became manifest, in the form of the financial crisis and, subsequently, the Great Recession.” For the relationship between increasing wealth in the hands of top income groups and the use of this in feeding bubbles and indebtedness, Stockhammer (2012) argues that rising inequality has increased propensity to speculate on the part of superrich individuals. The intuition behind this argument is that “with increasing income, the consumption possibilities get exhausted and speculative use of wealth increases” (Stockhammer, 2012: 15). Similarly, Wisman (2013) states that “windfall of income and wealth accruing to an elite was far greater than could readily be spent, even on the most lavish consumption, leaving them and their money managers with the challenge of locating ways to place these increased assets to maximum effect”. Moreover, he argues that “[s]eeking profitable outlets for its dramatically increased income and wealth, the elite fuelled first a stock market boom and then, after the high-tech bubble burst, a real-estate boom. It flooded financial markets with credit, helping keep interest rates low and encouraging the creation of new high-risk credit instruments that recycled part of the elite’s greater wealth as loans to those receiving smaller shares” (Wisman, 2013).

On the Marxian side, Resnick and Wolf (2010) analyze the responses of capitalists and workers to the conditions in the post-1970s and how they culminated in the recent crisis. According to them, the inequality of wealth and income, arisen from the ever-increasing wage-productivity gap, resulted in increased borrowing on

the worker's side and resulted in the flow of growing surplus into the hands of wealth-managing financial institutions (shadow banks) on the other side. For the latter response, they argue that growing surplus was distributed among banks and financial institutions that received interest payments and service fees; top corporate managers, specialists (lawyers, advertisers) and shareowners that received huge fees, bonuses, shares and dividends; land and technology owners that received rents; and merchants and retailers that received a share of surplus through discounts from giant producers. Accordingly, it is argued that exploding wealth of these communities flowed into the hands of specialized wealth-managing financial institutions, such as investment banks, hedge funds, mutual funds. Finally, they argue that the debt nexus provided by financial institutions that connect workers whose wages were squeezed for years to the investors who received a share from growing surpluses was the underlying dynamic of the developments in the recent era. They conclude that with intense competition among financial firms that drive them into subprime mortgage market, and given the innovations that bundle different securities in together, the collapse of subprime securities triggered the crisis.

Kotz (2008) argues that realization problem (or inadequate aggregate demand problem) was solved with increasing borrowing, which allows spending more than income. He argues that since borrowing entails increasing collateral, asset bubbles (stock bubble in the 1990s and housing bubble in the 2000s) have provided increasing collateral against borrowing and stimulating consumption in the end. Since this type of expansion created ever-increasing household indebtedness throughout the neoliberal period, and it reached unsustainable levels with the last bubble, this set the ground for a structural crisis with the break of the bubble, according to him.

On the other hand, another type of explanation focuses on the general link between stagnation and financialization rather than only on the increasing inequality and financialization and attributes more or less a functional role to financialization in alleviating the allegedly stagnationist tendencies in the recent era. Monthly Review scholars argue that rising of finance after the 1980s, as a relatively autonomous

structure from the productive base, created an important outlet to absorb growing surpluses, to employ a part of the labor force and to stimulate demand through its effects on asset price appreciation<sup>170</sup>. Foster and McChesney (2009) state that “unable to find an outlet for its growing surplus in the real economy, capital (via corporations and individual investors) poured its excess surplus/savings into finance, speculating in the increase in asset prices. Financial institutions, meanwhile, on their part, found new, innovative ways to accommodate this vast inflow of money capital and to leverage the financial superstructure of the economy up to ever greater heights with added borrowing”. This phase is defined as the monopoly-finance capital, referring to increasing reliance of corporations to the financial mechanisms in order to expand their capital, and to increasing reliance of the economy to asset price bubbles and debt in order to expand itself and it is characterized by stagnation-financialization trap. Besides, Kotz (2008) also attributes a functional role to bubbles in alleviating the adverse effects of real sector developments, although the basic structure of SSA does not entail such an attribution of functional role to bubbles because, in the end, SSA implies that both bubbles and real sector developments are the products of common causes, i.e. neoliberal policies and institutional transformation. Nonetheless, Kotz (2011:6) states that “such bubbles were the only means available to resolve the central macroeconomic contradiction of neoliberal capitalism between favorable conditions for profit-making and unfavorable conditions for realizing the growing profits, which would require growing final demand.”

In a similar kind of interpretation, Palley (2009, 2010) argues that in order to boost worsening demand generation due to structural problems, financial deregulations and innovations fill the hole that has been arisen from stagnationist macroeconomic tendencies. According to Palley (2009, 2010), given the structural problems, the neoliberal growth model increasingly relied on debt accumulation and asset price inflation in order to alleviate the negative effects on aggregate demand. He argues that “[t]he economic growth model adopted after 1980 lasted far longer

---

<sup>170</sup> Besides, Foster (2008) emphasizes on the role of military spending as an outlet, shortly.

than it might have been expected to because of our capacity to expand access to debt and increase leverage. That is the real significance of deregulation and financial innovation, which had a functional role in sustaining the neoliberal model” (Palley, 2009:12). In short, a functional role is attributed to financial innovations and deregulation in facilitating borrowing throughout the process. By this way, aggregate demand or inequality problems or stagnationist tendencies, wherever they have been arisen from, have evolved into the problems of finance, according to these accounts.

In short, there are three prominent arguments of the foregoing accounts. First, suppressed wages and relatively deteriorating income conditions on the part of workers and low- and middle-income groups has resulted in increasing borrowing. Second, increasing surpluses or rising income concentration for the sake of top income groups has resulted in feeding asset bubbles and credit booms. Finally, according to some accounts, for the last four decades, the US economy is characterized by stagnation and financialization cycles, in which stagnationist tendencies of mature capitalism or neoliberal period were alleviated by the pouring of excess surpluses of corporate sector to finance and by financial deregulation and innovations that facilitated borrowing and investment in financial assets.

For the first argument, Stockhammer (2012) shows that while the household debt share by income groups (according to net worth of households) remained stable between 1989 and 2007, debt-to-income ratio by income groups increased more in lower income groups (see Table.5.1). Thus, he concludes that “lower income groups have been driven into debt by falling wages (and social services) is consistent with the data” (Stockhammer, 2012: 15). In a similar vein, Setterfield (2010:16) focuses on the distribution of debt burdens and argues that “although wealthier households accumulate more debt in absolute terms, debt to income ratios are far higher in low and middle income households”. He (2010: 17) concludes that with increasing debt service burden on the part of lower and middle income groups, as a consequence, “financial fragility of household sector (and by extension the US economy as a whole) was increasing over time”.

Table.5.1 Debt-to-Income ratios by income groups in the US, 1989-2007

	<i>Percentile of the distribution of family net worth</i>				
	<i>0-50</i>	<i>50-90</i>	<i>90-95</i>	<i>95-99</i>	<i>99-100</i>
1989	0.61	0.81	0.71	0.5	0.25
1992	0.72	0.88	0.8	0.77	0.57
1995	0.89	0.92	0.77	0.67	0.43
1998	1	0.97	0.92	0.81	0.4
2001	0.89	0.99	0.73	0.59	0.32
2004	1.14	1.36	1.1	0.91	0.6
2007	1.37	1.48	1.07	0.95	0.37

Source: Kennickell (2009)

Source: Stockhammer (2012).

However, these arguments have important weaknesses. First and foremost, considering that wealthier households accumulate more debt in absolute terms and also considering that household debt share by income groups have not changed significantly for the last two decades, it is hard to conclude that wage suppression and growing inequality were the fundamental reason behind growing household indebtedness. Also, since household debt shares by income groups have not changed, but debt-to-income ratios has increased more in lower income groups, it is reasonable to derive that growing income inequality can account for the movements of these indicators. Since income grows more on the part of higher income groups, their debt-to-income ratios grows with a smaller pace than that of lower income groups. Although it is not obvious that growing income inequality brought about more borrowing for low- and middle- income groups, it is obvious that it can create different growth rates of debt-to-income ratio for different income groups.

Moreover, the empirical literature we reviewed in previous chapters points out that lower income groups have been driven into indebtedness only after the 2000s and only for the mortgage sector, not for other consumer debts (Mian and Sufi, 2008). In fact, one noteworthy figure from Setterfield (2010) points out that increasing overall household debt has been closely associated with rising mortgage debt for the last four decades, especially for the 2000s (see Figure 5.17). Moreover, many researches

show evidence on the determinacy of supply side factors in the build-up of growing mortgage loans (see the chapter on financial system). As aptly put by Dumenil and Levy (2011:18), “it is the function of lenders and of the central bank to define the standards for borrowing and adjust interest rates and regulation to borrowing trends”. Considering the outbreak of the crisis, we have shown in the previous chapters that many empirical studies point out supply-side factors, such as the deterioration in lending standards, which were set exactly by the originators of credits.

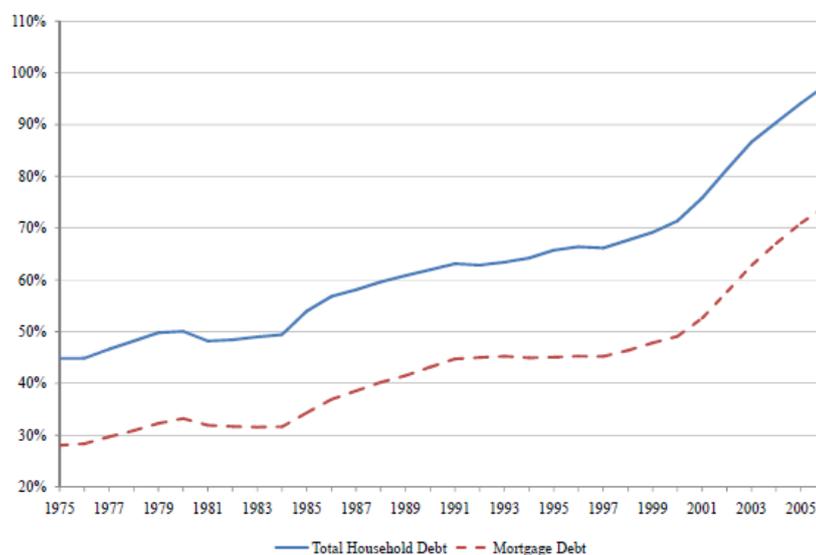


Figure 5.17 Total household debt and Mortgage debt as percentage of GDP

Source: Setterfield (2010).

Although we argue that foregoing arguments, i.e. suppressed wages created circumstances for increasing indebtedness or entailed it, are not persuasive, it is the fact that low- and middle-income groups got drawn into subprime mortgage bonanza. We think that this was not the result of gradually and relatively worsening conditions of workers, but the result of rapid developments in financial innovations, willingness of banking sector to risk-taking and increasing demand for those risky but high-yielding products. Moreover, Chomsisengphet and Pennigton-Cross (2006) show that while subprime mortgage lenders extended loans with different loan-grades during 1995-

1998 periods; when the market experienced its first collapse in 1998, lenders became more careful about extending loans with low loan-grades after 2001. This means that subprime lenders set the conditions for borrowing and they have sought the best borrowers of low- and middle-income groups insomuch as the other conditions allowed that.

Nonetheless, once low- and middle-income groups got drawn into mortgage borrowing, their debt and income conditions matters for the payments of debt. Therefore, as Setterfield (2010) pointed out, debt servicing might have been one of the main constraints on growing indebtedness and it might have determined the last stage of the boom. In a similar vein, Shaikh (2011), who points out a similar connection between indebtedness and fragility, shows that debt-service ratio of households, a much more relevant indicator for the severity of indebtedness, started to rise only after the mid-1990s peaking at 2007 and declining sharply as the crisis hit. Moreover, Lapavitsas (2010:8) notes that “[i]t is historically unprecedented for a global crisis to be precipitated by debt default among the poorest workers.” As a result, it seems that although workers’ relative condition and suppressed wages did not entail growing household borrowing, the outbreak of the crisis has certainly to do with the lower income groups and their problems related with affording debt servicing.

On the second point, which points out pouring of increasing wealth among top income groups into financial system, creating available funds to feed bubbles and contribute to low interest rates and other financial excesses, we could not find enough empirical discussion within the studies of those foregoing scholars. Nonetheless, Lysandrou (2009) provides deeper analysis and evidences that support the main argument. He proposes that huge concentration of wealth ownership after the 1980s was at the root of the recent crisis, creating excess demand for high-yielding securities, thence creating excess demand for those structure products after 2001. Considering the low-yielding environment after 2001, Lysandrou (2009) draws attention to investors’ pressure on investment banks and on hedge funds for high-yields, and the pressure of these firms for manufacturing alternative financial

products that could generate high-yields. In order to support this argument, he presents two figures that show how assets under the management of hedge funds have grown sharply during the 2000s (see the left-hand panel of Figure 5.18) and how much high the demand for structured products by hedge funds in 2006 (see right-hand panel of Figure.5.18). According to Lysandrou (2009), while those hedge funds held only 1 percent of the world’s total stock of securities, they held approximately one half of all CDOs, that generate above-average returns. Furthermore, he points out the role of wealthy individuals on demand for those assets. According to Lysandrou (2009), high-net-worth-individuals, which comprises 0.01 percent of world population, held \$19.3 trillion in securities, 17 percent of all securities; and 3.7 trillion in alternative investments, more than one half of all alternative investments, which includes investments under management of hedge funds. As a result, Lysandrou (2009) argues that demand for high-yielding structured products from hedge funds, which were pressured by demand for high-yields from mainly ultra-wealthy investors, has driven financial firms into manufacturing risky products and extending more mortgage loans to households.

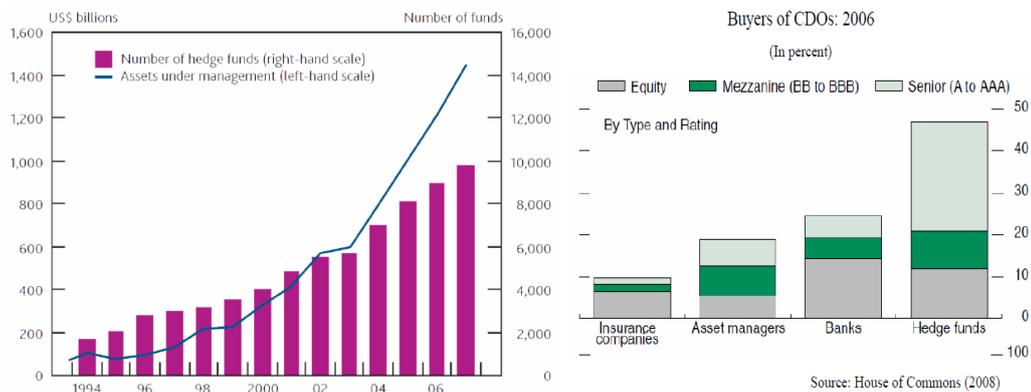


Figure 5.18 Growth of Hedge Funds and Demand Composition of CDOs

Source: Lysandrou (2009).

On the other hand, Bordo and Meissner (2012), covering the period from 1920 to 2008 and 14 advanced countries in their sample, they find no significant correlation between credit growth<sup>171</sup> and the growth of the top 1 percent income share. Also, their findings show that growing top income share is not correlated with interest rate movements during the credit booms. Moreover, they point out the other way causality between increasing inequality and credit booms in the cases of the existence of coincidence. They argue that since the balance-sheet of workers and consumers improve during the credit boom that affects their net worth through rising asset prices, “they may be able to easily sustain consumption growth with credit rather than demanding wage increases”, so, “[i]f workers are induced to limit wage demands, but creditors, capitalists, and rentiers take capital gains and benefit from the financial and economic expansion inequality might rise during the boom.” (Bordo and Meissner, 2012: 2151).

Although it is hard to draw conclusions from such a limited discussion that concentrates on the link between wealth concentration and credit booms, we think that this second channel (between wealth concentration and crisis) seems much more plausible than the first one (between depressed wages and household indebtedness). The arguments of Lysandrou (2009) draw attention to striking coincidences of wealth concentration, its effect on growing hedge funds, the concentration of hedge funds on purchasing structured products and rising of structured products with mortgage credit boom after 2001. On the other hand, Bordo and Meissner (2012), by construction of their empirical methodology, find only very broad generalities in credit booms of advanced countries; therefore, it seems that there has no role for the effect of income concentration. Nonetheless, one picture from Bordo and Meissner (2012) also points to the possibility of a correlation between wealth concentration and credit booms for the US case. In Figure 5.19 below, it can be seen that the changes in bank loans has become tightly correlated with the changes in the income share of top 1 percent of income earners in the US after 1980, although there seems

---

<sup>171</sup> Bordo and Meissner (2012), firstly, run a regression in order to test the hypothesis that real credit growth and the probability of banking crisis are positively correlated in their sample and find confirmative results.

no correlation between these variables before that date. Nonetheless, as pointed out by Bordo and Meissner (2012), it should be careful about two way causality between growing inequality and credit booms. As a result, although the discussion and evidence is not enough to draw more robust conclusions, it seems that there was much role for the relationship between wealth concentration and its effect on the build-up of financial excesses than the alleged relationship between weakening income and high household indebtedness.

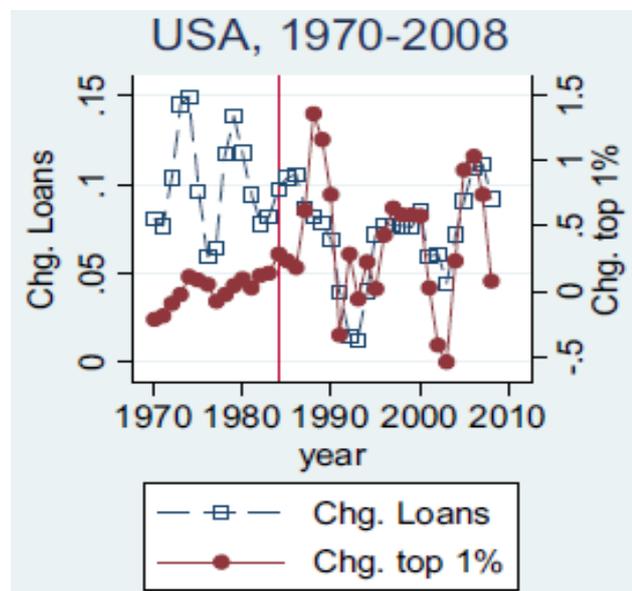


Figure 5.19 Changes in Bank Loans and Changes in Income Share of top 1 percent of income earners in the US, 1970-2008.

Source: Bordo and Meissner (2012: 2156).

Notes: “Chg. Loans is the 3-year moving average of the annual change in the logarithm of the ratio of total bank loans to the domestic consumer price index. Chg. Top 1% is 3-year moving average of the annual change in the percentage share of the top 1% of income earners.” (Bordo and Meissner, 2012: 2156).

On the third point, which attributes a functional role to the finance in alleviating the adverse effects of real sector developments, Palley (2009) argues that growing household indebtedness and non-financial corporate debts during the entire neoliberal

period provide evidence on the role of debt in alleviating the adverse effects of the neoliberal growth model. Furthermore, since the periods of excess housing price inflation (measured as the difference between average house price inflation and average CPI inflation) coincided with three boom periods, including 1987-1990, 1995-2001, 2001-2006, this show evidence on the systemic role of the asset bubbles in driving economic expansion through wealth effects and easier borrowing conditions with good collaterals during the neoliberal era, according to Palley (2009). Finally, by comparing the 2001-2007 cycle with the other cycles of postwar period, Palley (2009) shows that the latest cycle was the worst (or nearly the worst) in several measures, including the growth of GDP, consumption, investment, employment, wages and so on. Thus, he argues that “[t]his weak performance occurred despite a house price and credit bubble of historic proportions. It is clear evidence of the structural weakness of the U.S. macroeconomic model and why a bubble was needed to sustain growth” (Palley, 2009:25).

The other evidences provided by those attribute a functional role to the finance in alleviating macroeconomic problems are more or less similar with those presented in the first and second points. The main idea here is the centrality of the real sector problems and ascribing a secondary or functional role to the finance. There are two fundamental weaknesses in this type of arguments. Firstly, these arguments do not fit well to the general picture of the recent era. As we have shown above, these analyses start with putting stagnated real wages at the centre and displaying its possible macroeconomic effects, such as depressing consumption and aggregate demand or the problem of realization of surplus value, thereby the suppression of growth. However, increasing consumption share and more or less stable wage share was the characteristics of the recent era. Moreover, although average growth rate was well below the post-war era, there were striking transient growth periods. Again, capital accumulation was weak but it seems that this was not the product of “insufficient aggregate demand”. The main problem of this type of analysis is the centrality of real wage stagnation and its adverse effect on demand, thereby linking all those phenomena of the neoliberal period to these central factors. In the end, “financialization”, the expansion of financial sector, repeating asset bubbles and

many other finance-related phenomena are linked to those central factors with a functional role. In doing so, both those phenomena that could not be explained by the developments in the real sector are explained with finance-related developments and the recent crisis was linked to the financial sector problems. Indeed, we do not think that asset bubbles or credit booms were the only means to revitalize aggregate demand, manufacturing and employment during the neoliberal period as opposed to Kotz (2009) and Palley (2009), but there are other factors, such as technological developments during the 1990s or gradually developing neoliberal globalization and related global relocation of investments that could pour cheap goods and abundant profits into the US economy. This means that finance was not the only solution for the “problems” of real sector, although it certainly affected real sector developments.

Secondly, as we argued in the previous chapters, the crisis was certainly related with financial sector development, as admitted also by foregoing interpretations, but we think that financial sector developments were not only the means for the development of real sector and they have had own dynamics that interacted with real sector developments throughout the process. In other words, the interaction between financial sector and real sector is not determined one-sidedly. Of course, some of those foregoing arguments, such as SSA theory of Kotz (2008) and Wolfson and Kotz (2009), or the arguments of Resnick and Wolff (2010), leave large rooms for developing theoretical structure to analyze both real and financial sector developments by giving equal weight to each other and by considering them in two-sided deterministic interaction. Nonetheless, in some interpretations, the authors of these studies also attribute only a secondary role to financial developments. We propose that, for example, relying on the structure of Kotz (2008), three features (stagnated real wages and growing inequality, growing financial sector, and repeating asset bubbles) of the neoliberal period arisen from its institutional structure can be used to explain the crisis of recent period, but without giving centrality to growing inequality.

We argue that considering the relationship of financial developments with other developments, Lapavistas (2010) proposes one of the most useful and successful

theoretical structures to analyze the developments that ended up with the crisis. He (2010: 17) states that “[i]t is misleading to seek direct causation along the lines of ‘troubled production has led to growth in finance’, or ‘booming finance has led to weak production’<sup>172</sup>. The real issue is to specify the mediations through which malaise in production has been associated with booming finance in recent decades. This involves establishing changes in the behaviour of industrial capital, the operations of banks, the practices of workers, the articulation of financial markets, the interventions of the state, and so on. These are also necessary steps in demonstrating the character of financialisation. The issue, in other words, is to show how industry, banks, workers, financial markets, and so on, have become ‘financialised’, individually as well as jointly. Causation between indifferently performing real accumulation and a booming financial system would then appear in its several dimensions.” Relying on this framework, Lapavitsas (2010) identifies three key areas in which the transformation of relationships among financial sector, industry and households have changed and created the fundamentals that paved the way for the recent global crisis. According to him, first, large corporations became more independent from banks in their financial activities; secondly, as a response to the first, banks restructured themselves in way that they turned towards and extract profits from individuals, whose revenues and savings have got drawn into the spheres of finance throughout the process; and thirdly, again as a response to the first, banks engaged in more financial market mediation and turned towards investment banking. In this structure, for example, stagnated real wages are included in the explanation of the transformation of the relationship between banks and individuals. As a result, we think that the structure and critics proposed above are

---

<sup>172</sup> According to Lapavitsas (2010: 17), “[c]ausation between real accumulation and finance ... runs in both directions, even if the former sets the parameters for the latter. Even more important, however, is that such causation is never direct but always mediated, and heavily so. A complex set of structures, often reflecting historical, institutional, political, customary and even cultural factors, mediate the interaction between finance and real accumulation. Thus, real accumulation shapes the financial system through the trade credit customs and practices of industrial corporations, the replacement of trade by banking credit, the availability of reserves and liquidity for banks, the informational environment of inter-bank lending and so on. Finance, on the other hand, impacts on real accumulation through credit accelerating the turnover of capital, lower money reserves improving enterprise profitability, loans and information opening up new areas of profitability, and so on.”

very useful in capturing the developments of neoliberal period that paved the way for the recent global crisis in a coherent structure.

## **5.2. Was profitability underlying cause of the crisis?**

Among Marxian accounts of the crisis, one stream of scholars put long-term profitability trends at the center of their analyses since its determinant role on capital accumulation, investment and growth. The structure of arguments that we focus on in this part resembles the previous demand-based explanations and the second part of the arguments is more or less same with the foregoing views. In general, it is argued that after the 1970s capitalist class succeeded in withstanding against declining trend of profits, mostly thanks to the policies that suppressed wages (Shaikh, 2011; Moseley, 2011). However, this prepared the ground for the problem of household indebtedness. When growing indebtedness reached its limits, the financial crisis erupted and underlying weakness in the profit rate and accumulation surfaced.

Shaikh (2011) mainly argues that underlying movements of the profit rate, which is the driver of “alternating long phases of accelerating and decelerating accumulation”, create the fundamentals for an economic collapse as triggering events activate the process. Thus, he focuses on the long-run trends of profitability in the US and his analysis takes “the rate of profit-of-enterprise” as the central variable, which is the profit rate minus the interest rate. Shaikh (2011) argues that this is the driver of active investment, so capital accumulation<sup>173</sup>.

Shaikh (2011) starts with analyzing the path and the trend of actual rate of profit (before interest payments and taxes) for non-financial corporations in the US from 1947 to 2008. Based on his findings, he argues that trend rate of profit (sterilized

---

<sup>173</sup> Shaikh (2011) calculates the rate of profit-of-enterprise in the following way: First, he calculates the before-interest and taxes to derive actual profit rate of non-financial corporate sector. Then, he extracts the 3 month T-bill rate from the actual profit rate to get the main variable. He considers this interest rate as the benchmark, the safe alternative, or the return to a passive investment, referring to Marxian and Keynesian propositions. Also, he adds that the rate of profit-of-enterprise corresponds to the concept of “economic profit” in neoclassical economics, so the interest rate he refers to corresponds to the interest equivalent on the capital stock. Finally, we should note that Shaikh (2011) uses the current-cost capital stock measure for as calculating profit rates.

from the short-run fluctuations) moved downward until the first half of the 1980s and then stabilized. He explains this pattern with the growing gap of real wage and labor productivity, which implies the rise of the rate of exploitation, thereby surplus value and a positive effect on the actual profit rate trend. By employing a counterfactual path of actual profit rate, considering as if real wages were not suppressed in the Reagan era and continued on their postwar trend, he argues that the effect of wage suppression was dramatic (the counterfactual rate falls to the interval of 3-5 percent as the actual rate fluctuates 10-12 percent). Nonetheless, his novel proposition bases on the idea that the “great boom” of the post-1980s relies on the extraordinary fall in the interest rate (namely, 3-month T-bill rate) after the first years of the 1980s alongside the wage suppression dynamics. Thus, Shaikh (2011) calculates the rate of profit-of-enterprise by extracting this interest rate from the actual profit rate, considering it as the driver of accumulation (see Figure 5.20), and argues that this shows the positive effect of both wage suppression and the fall in the interest rate on the accumulation dynamics in the recent period.

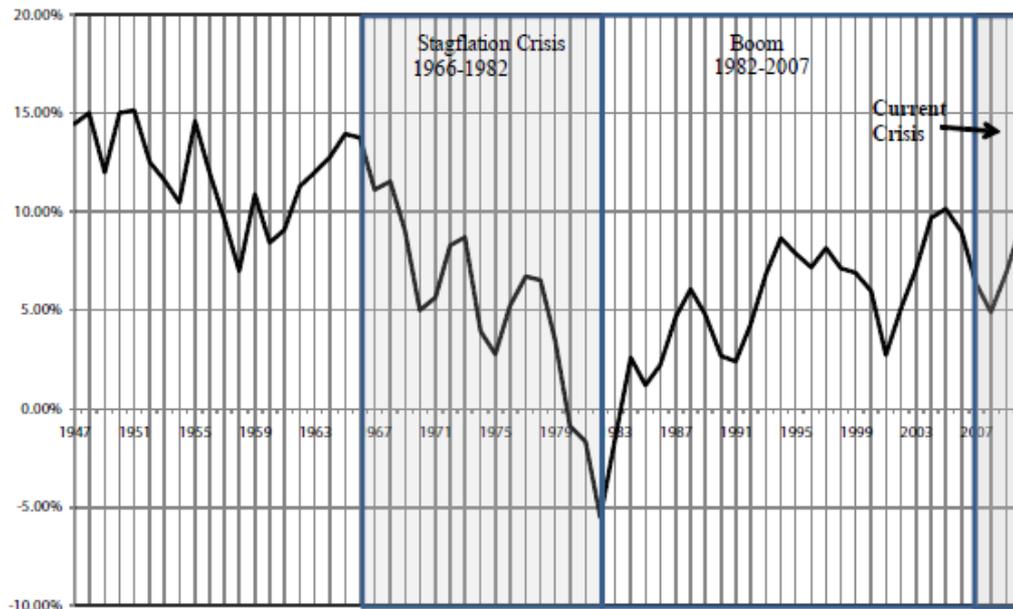


Figure 5.20 The rate of profit-of-enterprise in the US, 1947-2008, by Anwar Shaikh  
Source: Shaikh (2011:52).

Finally, based on this background, Shaikh (2011) argues that both of the dynamics that made positive effects on the accumulation was inherently contradictory and they paved the way for the dynamics that ended up with the crisis. He argues that wage suppression had a side effect on the consumer spending, but with the fall of interest rates and easier access to credit this tendency was suspended during the boom. Finally, he explains the bust with the limits of the fall in interest rates and the limits of the rise in household indebtedness and in household debt-service ratios.

In a more or less similar account, Moseley (2011) argues that the underlying causes of the crisis were the long-term declining trend in the profit rate from 1950s to 1970s and subsequently the responses of the capitalists in order to restore the profitability. Therefore, he emphasizes on the strategies that restore profitability, such as wage suppression, inflation, speed-up in the workplace and globalization. By this way, he concludes, “there has been a substantial recovery of the rate of profit in the United States” (Moseley, 2011: 63). However, according to Moseley (2011) despite the restored profitability, business investment has not increased substantially because of the higher dividend payments to stockholders, buying-back of the shares, loaning money and investing in the low-wage countries rather than in the homeland. Thus, the combination of the growing profits and weak investment resulted in the search for new borrowers on the part of capitalists outside the non-financial corporate sector. Considering the wage suppression, he argues that banks directed money into the workers class, which resulted in the increasing household indebtedness. As a result, he argues, “[i]n this way, the profitability crisis for firms has evolved into an overindebtedness crisis for households” (Moseley, 2011: 64)

In sum, both of these accounts sees the contradictory response of capitalist classes to declining profit rates of the roughly 1950-1980 periods as the underlying cause of the recent crisis. Although, wage suppression was the main mechanism of the restoration of profitability for both of them, the dynamics that paved the way for the crisis was a little bit different. While Shaikh (2011) directly links wage suppression with increasing borrowing, Moseley (2011) draws attention to dynamics

that poured excess funds of the non-financial corporate sector towards households with the mediation of banking sector. Since we criticized direct association of wage suppression and increasing borrowing in the previous section, we will not elaborate on this point any more. However, although Moseley (2011), in general, attributes a secondary role to the finance in his analysis, the mechanism proposed here is worth-pondering. Firstly, as opposed to Shaikh (2011), he points out general weakness in accumulation despite restored profitability. He counts more or less similar factors that we stressed on in the previous section while criticizing MR school. Higher dividend payments, buying-back of shares, loaning money and investments in overseas are factors that explain the distance between weakening accumulation and stable profits, according to Moseley (2011). The significant point here is the emphasis on the mediation by banks that direct those non-invested funds towards household sector. Thus far, we have not encountered any study that investigates the role of those funds of non-financial corporate sector in extending the available resources of the financial sector. Nonetheless, theoretically, this point is very strong. Moreover, such causation does not necessitate attributing a secondary or complementary role to the finance and can be fitted into our interpretation, which gives more or less equal weights to the developments in real and financial sector and draws attention to two- way causality.

Although we have discussed elaborately on the accumulation, investment and profit rate dynamics in the previous section, the studies of Shaikh (2011) and Basu and Vasudevan (2012) pose new questions and findings on these points. As it is shown above, Shaikh (2011) implies that there was robust accumulation of capital during the neoliberal period since “the rate of profit-of-enterprise” display a rising trend. This means that the crisis of 2007/08 fell on to a peak of long-term accelerating accumulation period. We think that it is hard to associate this view with falling rate of accumulation, the characteristic of the neoliberal period (see Figure.5.8) and the sharp recession after the financial crisis, while the rate of profit-of enterprise did not fall exceptionally (see Figure 5.20). Moreover, using real interest rate instead of nominal interest rate (3-month T-bill rate) in the calculation of the rate of profit-of-enterprise would be more appropriate since both measures of

profit rate and interest rate provides the preservation against inflation in this case (Dumenil and Levy, 2011). Also, it is not clear why short-term interest rate is used instead of long-term interest rate, which would be more appropriate considering the duration of real investment (Dumenil and Levy, 2011). Nevertheless, even if both of these concerns are taken into consideration, Dumenil and Levy (2011) find that the profiles of the rate of profit-of-enterprise in each three measures do not fit the patterns of the rate of accumulation, as opposed to the claim of Shaikh (2011).

On the other hand, Basu and Vasudevan (2012) provide much more detailed analysis of the profit rate patterns, concluding that “[d]eclining profitability might not have caused the Great Recession, but it certainly is an intimation of an impending profitability problem” (Basu and Vasudevan, 2012). Referring to the variety of empirical methods and theoretical arguments in the calculation of the profit rate and in its decomposition, and emphasizing on the absence of agreement even on the basic question of empirical trend of profitability among discussants, they plot several measures of the profit rate for the US, capturing 1946-2010 period<sup>174</sup>. Their main conclusion from the trends of nearly all measures of the profit rate (except for one measure<sup>175</sup>) is that declining trend of probability was reversed in the early 1980s and subsequent period has witnessed either trendless or a slightly increasing trend of profit rate. Thus, relying on this extensive research on profit rates, it can be argued that the crisis was not preceded by a trend of declining

---

<sup>174</sup> Basu and Vasudevan (2012) plot over 80 different profit rate time series in 20 figures, including appendix. The measures they used include the calculations according to the separation of corporate business, non-financial corporate business, non-farm non-financial corporate business; according to the separation of replacement cost and historical cost values of capital stock; according to the separation of net total fixed assets, gross total fixed assets, non-financial assets and net worth in order to measure capital stock. Based on this sectoral separation and different measures of capital stock, they calculate profit flows for a year with several measures, including the broader one, income flows less of compensation of employees, and then the narrower ones, subtracting indirect taxes, interest payments, dividend payments, direct taxes. Finally, in the appendix, they include non-farm inventories to some of the basic capital stock measures.

<sup>175</sup> This exceptional measure includes the historical cost valuation of capital stock and broader measures of profit flows for both non-financial and total corporate business sectors that display a secular trend of decline for the entire postwar period. However, the authors argue that historical cost valuation of capital stock tend to rotate the profit rate series. See Basu and Vasudevan (2012) for more on this issue.

profitability, but only was preceded by a short-term downward movement associated with a business cycle fluctuation (Basu and Vasudevan, 2012).

Furthermore, Basu and Vasudevan (2012) decompose the profit rate into the variables that captures the effect of technology and distribution in long-periods in order to assess the role of these factors on the profitability trends. Their fundamental decomposition is as follows:

The rate of profit = (profit/output) × (output/capital stock);

where the former indicates profit share (measured as the ratio of net operating surplus –i.e. net value added less employee compensation less production and import taxes- to the net value added) and the latter indicate capital productivity (measured as the ratio of net value added to net stock of total fixed assets)<sup>176</sup>. Their findings mainly are as follows. Firstly, they find that capital productivity followed an alternating path of four phases from 1958 to 2010, in which it increased from 1958 to 1966 or 1968, and then declined until 1982; and reversing the trend, it increased slowly until 2000; finally, reaching a peak below its 1968 level, it has significantly trended downward in the 2000s by falling below the level of 1982 in 2009. In the end, capital productivity reached the lowest level of the entire post-war period in 2009 (Basu and Vasudevan, 2012). Secondly, they find that distributional aspect of profit rate displayed two distinct patterns separated by 1982. In the first phase, the profit share trended downward significantly, especially after the late 1960s, while in the second phase, the trend has been reversed (Basu and Vasudevan, 2012).

Firstly, an important finding of this study considering our discussion is that rising profit share of the recent phase is reflected more in the whole corporate business sector, reaching the level of the 1950s, than in the nonfinancial corporate business sector, so “giving evidence of the rising share of profit accruing to the financial sector” (Basu and Vasudevan, 2012). This provides evidence for the

---

<sup>176</sup> We should note that Basu and Vasudevan (2012) argue that this decomposition allows demand fluctuations to affect both profit share and capital productivity as opposed to three-components decomposition which includes capacity utilization and allows demand to affect only utilization rate. See Kotz (2009, 2011) for such an application of three-component decomposition.

argument that although profitability restored after the late 1970s, a significant portion of profits poured into the hands of financial corporations. Secondly, this study also shows that for the two recessions of the 2000s, the late phases of the cycles (two or three years before the recession) witnessed a declining profit share, but with a quick recovery. This further supports the findings of Kotz (2009), but with a more broad perspective, it also supports the “underconsumption crisis” view since profit share shows rising trend and we know that capacity utilization declined throughout the period. However, reminding that consumption share has displayed ever-increasing trend, it is not easy to fit the recent crisis into “underconsumption crisis” concept. Finally, these findings do not support any view that explicitly or implicitly proffers ever-declining profitability due to technological effects –i.e. ever-increasing organic composition of capital and declining capital productivity. This study shows that this was not the case for the period between 1982 and 2000. Although Shaikh (2011) does not explicitly refer to the law of tendency of the profit rate to fall in his study, its counterfactual rate of profit implies his embracement of the law in this analysis. The findings of Basu and Vasudevan (2012), on the other hand, imply that such a counterfactual analysis based on different real wage paths may not reflect the reality and overstate the role of real wage patterns on profit rate patterns<sup>177</sup>. Nonetheless, there is a room for the law of tendency of the profit rate to fall, but they differ from other views analyzing the materialization of this tendency in different periods.

Above all, Basu and Vasudevan (2012) mainly argue that post-1980s witnessed a favorable trend of the profit rate due to favorable effects of both distribution and technological change, which allows for capital-saving and increasing capital productivity. The latter point is the original argument of this study, as opposed to the general view that attributes favorable trends in profit rate to only stagnated real

---

<sup>177</sup> This finding of Basu and Vasudevan (2012) is also dispute with the arguments of Brenner (2009), who dubbed the crisis as “overaccumulation crisis”. He mainly proposed that ever-declining profit rate as the result of overaccumulation that were concealed by asset bubbles resurfaced with the burst of bubble in the recent crisis and depressed economic activity sharply. In this study, we will not elaborate on the discussion about the arguments of Brenner (2009). Original views of Brenner can be found in Brenner (2002, 2006). The critics of these arguments with regard to the recent crisis can be found in Dumenil and Levy (2011) and Lapavitsas (2010).

wages. To prove this, Basu and Vasudevan (2012) further analyze the components of capital productivity. In doing so, they capture the effect of capital intensity (capital per labor) to the trend of profit rates and assess the role of Marx-biased technical change in the recent profit rate patterns. In Marxian terms, increasing organic composition of capital (or capital intensity) mainly driven by capitalist competition constitutes the basis of the theory of the tendency of the profit rate to fall.

Initially, Basu and Vasudevan (2012) show that labour productivity and capital productivity followed distinct patterns in different periods of the postwar era. While they moved towards opposite directions in the periods of 1966-1982 and the 2000s, they both increased from 1982 to 2000, not conforming to the pattern of Marx-biased technical change. Accordingly, they decompose the capital productivity in two ways to analyze these patterns<sup>178</sup>. Firstly, relying on the decomposition of capital productivity (output per capital) into labour productivity (output per labour) and capital intensity (capital per labor), they find that since labour productivity grew roughly at the same rate after 1982, including 1982-2000 and the 2000s period, different patterns of growth of capital productivity reflect different patterns of capital intensity growth during the neoliberal period (See Figure 5.21). This means that capital intensity (organic composition of capital) did not increase enough to drive profit rates downward during the 1982-2000 periods. Thus, not only depressed wages contributed to the restoration of profits, but also some other factors suppressed the growth of capital intensity and contributed to restoration of profit rate after the late 1970s until 2000.

---

<sup>178</sup> Two ways of decomposition are in the following ways: Firstly, by definition, capital productivity ( $Y/K$ ) is the ratio of labour productivity ( $Y/L$ ) and capital intensity ( $K/L$ ). Thus, growth rate of capital productivity is equal to the difference of two decomposition variables. Secondly, capital productivity can be written as the ratio of the real capital productivity and the relative price of capital. This will be in the following way:  $\frac{Y}{K} = \frac{Y/P_Y}{P_K/P_Y}$  where  $Y/P_Y$  is the real net value added deflated by GDP deflator,  $K/P_K$  is the real capital stock deflated by an implicit price deflator, and  $P_K/P_Y$  represent the relative price of capital.

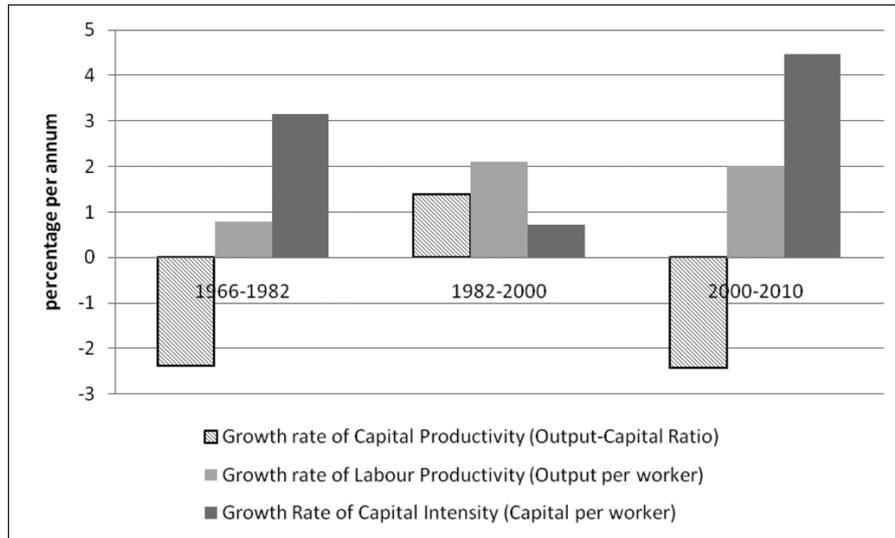


Figure 5.21 Decomposition of capital productivity growth rate for the US, 1966-2010.

Source: Basu and Vasudevan (2012).

Moreover, considering the weak growth in capital accumulation during the 2000s and the implications of Marxian theory on the role of rapid accumulation in capital-intensive technical change, the unusual growth of capital intensity in the 2000s was paradoxical under the conditions of weak accumulation; therefore, it needs to be explained (Basu and Vasudevan, 2012). Relying on the decomposition of capital productivity into real capital productivity and the relative price of capital, Basu and Vasudevan (2012) find that since the 1980s real capital productivity displays a stable trend, while nominal capital productivity have been driven by the relative price of capital for the entire period<sup>179</sup> (see Figure 5.22). The relative price of capital shows a declining trend until 1993, after it had reached a peak in 1982. Then, it remains stable until 2004, after which it starts to increase. This means that the end of favorable trends in the relative price of capital goods in 2004 precipitates downward movement of profit rates in 2004. This finding also complements the lack

<sup>179</sup> Moreover, Basu and Vasudevan (2012) use both net total fixed assets and net non-residential fixed assets to measure capital stock and since the results are the same for two measures, they argue that their findings are not affected by the housing price boom.

of explanation for distinctive price-ratio developments of the recent boom-bust cycle in the studies of Kotz (2009, 2011), who focus only on short-term explanatory factors. In fact, the analysis of Kotz (2009, 2011) allows relative prices to affect only profit share and finds only a small effect for the recent period. However, Basu and Vasudevan (2012) allow them to affect capital productivity and show that long-run changes in relative prices changed the patterns of capital productivity after 2000s. Basu and Vasudevan (2012) remind that, in theory, cheapening of capital goods relative to all goods gives an indication of rapid technological change, therefore it can increase the rate of profit and this may contribute to explain the patterns of the profit rate between 1980 and 2000. Thus, Basu and Vasudevan (2012) argue that the decline in capital productivity in the 2000s reflect the declining pace of technological progress in the capital goods and the exhaustion of the gains of the previous two decades, arisen from the adoption and growth of information technology, new forms of organization and managerial control, globalization and relocation of production.

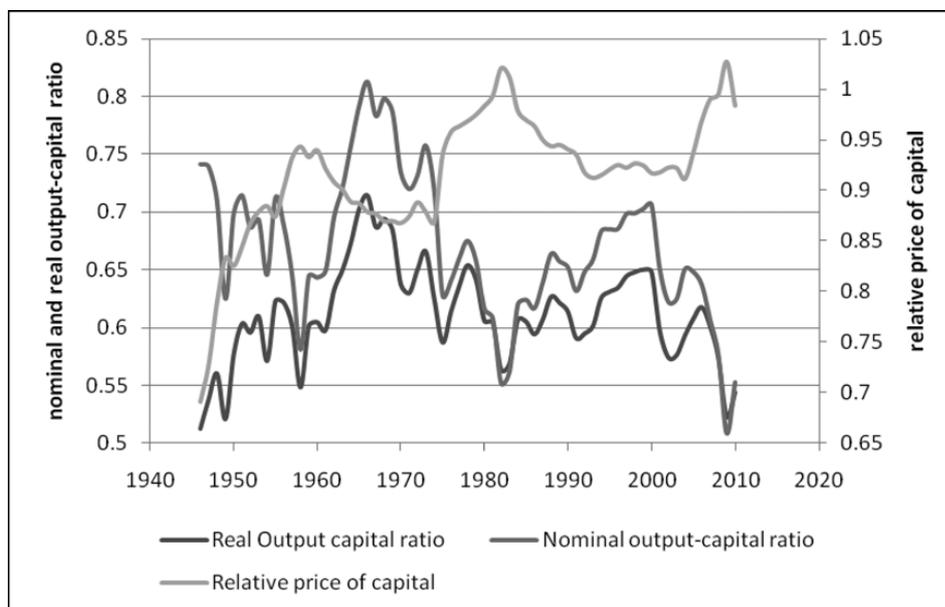


Figure 5.22 Alternative Decomposition of Capital Productivity growth rate for the US, 1947-2010

Source: Basu and Vasudevan (2012).

Thus, based on the findings of Basu and Vasudevan (2012), and collating these findings with those of Kotz (2009, 2011), we can argue that given the favorable technological changes went down in the late 1990s and given falling capital productivity in the 2000s driven by rising capital intensity (organic composition of capital), although favorable distributional factors maintained throughout the 2000s, when the share of profit declined with increasing relative price of capital before the crisis of 2007, the ground for another structural crisis of capitalism was ready. This does not mean that the recent crisis was the crisis of profitability, but we argue that a severe financial crisis that was capable of depressing real economic activity for a long time coincided with the end of favorable technological trends that helped restore the profitability during the first two decades of neoliberal period. Although regressive distributional factors have still been effective on profit rates positively, what we observe from numerous presentations of the patterns of profit rates is that profit rates got stuck on the levels of the 1970s at best, despite three-to-four decades-long wage suppression. We offer that while interpreting the deepness of the recession and post-crisis stagnation, profitability still matters. On the other hand, we are aware of that the profit rate patterns had nothing to do with the characteristics of the recent crisis, i.e. the collapse of mortgage boom and high-level of financial and household leverage which was driven by three-decades-long financial deregulation process and the rapid developments in new financial products and practices. The only possible contribution of these real-side developments to explain the characteristics of the crisis might have come from the “excess funds” –which were the result of depressed accumulation and restored profitability- that poured into financial sector in the long-run. These excess funds of non-financial corporate sector might have contributed to increase liquidity and decrease funding constraints in the financial markets.

### **5.3. Conclusion**

In general, the literature reviewed above attributes the long-term causes of the crisis to the structural and inherent problems of the capitalism, or of neoliberal period. In this chapter, we criticized some of those views, but we found also important interpretations that could be helpful in solving some parts of the puzzle.

Firstly, we analyzed the chain of arguments that link the growing gap of real wage and productivity during the neoliberal period to the crisis. At the first step, these arguments point out that the severance of real wage and productivity growth paths would entail inadequate aggregate demand through declining wage share in GDP, so creating structural weaknesses in the economy. However, we showed that wage share has not changed so much during the neoliberal period. Although this pattern of wage share could be attributed to increasing managerial salaries as real wages of workers were declining at the same time, there is no reason to assume that managerial salaries did not spend in the year they were generated, resulting in inadequate consumption and aggregate demand. Moreover, we argue that ever-declining average saving rate could be an indicator of increasing consumption of top income groups, including managers. Besides, we argue that relative price developments could also explain the stability of wage share. What is more, ever-increasing share of consumption in GDP and short-winded but striking investment booms show the opposite of the implications of these arguments.

Besides these arguments, some of the Marxist scholars point out different indicators of structural weaknesses as a consequence of the growing gap between real wage and productivity, such as rising surpluses that could not find investment outlets, thereby declining rate of accumulation and rising excess capacity in manufacturing sector. Both of these indicators are thought as indicators of inadequate aggregate demand. After a discussion on the validity of these arguments, we drew attention to other possible sources of declining capital accumulation rate and declining capacity utilization rate. Although we did not show robust evidences for the latter one, we argue that these two important phenomena might have reflected mostly supply-side developments. Moreover, we could not find any indicator of rising surpluses, which displayed more or less stable trend between the late 1970s and the mid-2000s. However, there was excess surplus arisen from declining rate of accumulation in the non-financial corporate sector. Nevertheless, it seems that this excess surplus and declining rate of accumulation most probably do not reflect the absence of investment outlets arisen from inadequate aggregate demand. Arguably, they reflect most probably changing investment strategies of corporations during the

neoliberal globalization process, distributional aspects or other short-term concerns about balance-sheets. Although we think that all those Marxian and non-Marxian approaches indicate important structural vulnerabilities in the US economy, the way their arguments followed seems not robust while they attempt to explain the crisis with structural problems and the basic evidence we provided in this chapter do not support these arguments. In short, we argue that the crisis does not seem as the result of structural demand weaknesses arisen from the severance of productivity-wage growth, despite its other important consequences.

Nonetheless, considering that demand-side factors could be effective in short-run periods, we analyzed the studies of Kotz (2009, 2011), who investigate the determinants of declining profit rates at the last phases of business cycles. For the preceding period of the recent global crisis, he finds that declining profit rate mainly reflects the decline in the rate of capacity utilization and partly declining profit share, which reflects increasing tax share and interest payments share despite the decline in wage share. Relying on these findings and on the analysis of the growth rates of GDP components, Kotz (2011) argues that the recent crisis can be characterized as an asset-bubble driven over-investment crisis. We think that the arguments of Kotz may be very insightful in understanding the effect of real-side developments on the recent recession, despite some shortfalls of this analysis. During the recent boom period, wealth effect of the bubble and optimistic expectations about future profits might have been very influential on consumption and investment demand, creating excesses in both of them during the boom and bringing about sharp decline in consumption and excess capacity in manufacturing when the bubble burst. These arguments partly conform to the facts; nonetheless, they do not seem as being able to fully capture the deepness of the recession. The deepness of the recession may be explained both with those real side factors and dry-up of credits to the real sector after banking sector was severely hit by the financial crisis and went into severe deleveraging process.

In the second part of these aggregate demand-based interpretations, in general, financial sector developments are incorporated into analysis by giving them to a

secondary or functional role. It is argued that financial developments (growing household indebtedness and asset bubbles) mainly alleviated the effects of real sector developments temporarily, but when they reached their limits, structural weaknesses of the economy revealed paving way to a structural crisis. Two types of mechanisms are proposed. First, it is argued that while the adverse effects of suppression of real wages created the need for borrowing and they were alleviated by increasing household indebtedness, this created vulnerabilities that revealed with the outbreak of the crisis. Secondly, increasing wealth or surpluses on the part of top income groups fed into the bubbles of neoliberal period, poured into speculative financial activities or contributed to credit booms that bound to burst in the end, according to these interpretations.

We argue that the evidence provided for supporting the first channel is not persuasive. Since growing household indebtedness of the neoliberal period was mostly driven by growing mortgage debt and low- and middle-income groups got drawn into mortgage borrowing only at the latest phase of the neoliberal period, we think that this does not correspond to gradually worsening conditions of the workers. Moreover, we argue that, in general, lenders, regulators and policymakers set the conditions for the rise of borrowing and worsening conditions of workers do not entail the rise of household indebtedness. Nonetheless, since low- and middle-income groups got drawn into mortgage borrowing in the end (because of mainly supply-side developments), their debt and income conditions might have mattered for the last stage of the housing boom. Therefore, it can be argued that the outbreak of the crisis has certainly to do with the lower income groups and their problems related with affording debt servicing. On the second channel that links income concentration to financial excess, although we presented a limited discussion and evidence, we argue that this channel seems much more plausible than the first one. The limited literature provides striking coincidence of wealth concentration, its effect on growing hedge funds, the concentration of hedge funds on purchasing structured products and rising of structured products with mortgage credit boom after 2001. Moreover, although the evidence shows that there has not been universal relationship between the changes in the income share of top income groups and credit booms, these variables were tightly

correlated with each other after 1980 for the US case. Nonetheless, it should be noted that there is a possibility of two way causality between income concentration and credit booms.

Besides, we discussed the argument that puts real sector problems at the center of analysis and ascribes only a functional role to financial sector developments. We argue that this type of analysis neglect the two-way interaction at some points and do not explain prominent phenomena of the neoliberal period well. Financial sector developments could not be considered as only the means for alleviating the adverse effects of real sector developments since they have had own dynamics. A coherent explanation that focus on long-term underlying causes of the recent crisis should give equal weights both financial sector and real sector developments without putting any of them into the center. In fact, financial sector developments explain most of the causes of the recent crisis. Nonetheless, the transformation of the financial system was accompanied with the transformations in the relationships between financial sector and productive sector and between financial sector and households. Inasmuch as real-sector developments contributed to the transformation of these relationships, an analysis of them may be very helpful. Although such an analysis is beyond the scope of this thesis, as we have mentioned inside this chapter, Lapavitsas (2009, 2010) points out important developments that could generally explain the phenomena of the 2000s, such as the orientation of corporations towards open financial markets instead of banks in their external financing and consequently the orientation of banking sector towards individuals and investment banking activities as the main sources of profits. Besides, Dumenil and Levy (2011, 2012b) also provides a flexible structure to analyze the developments of the neoliberal era and long-term causes of the crisis, in which the interactions among globalization, financialization, growing indebtedness, trade deficit, slow accumulation, quest for high income paved the way for the crisis.

Finally, we shortly analyzed some of the prominent views that take the long-term trend of profit rates into the center of their analysis. In general, it is argued that the contradictory responses of capitalists to declining profit rates of the roughly

1950-1980 periods were the underlying causes of the recent crisis. At first, wage suppression is indicated as the main mechanism of the restoration of profitability in these analyses, and again the link between wage suppression and increasing borrowing is presented as one of the dynamics that paved the way for the crisis. However, as we have discussed, this explanation does not correspond to some of the facts. Also, these interpretations have similar problems to that of inequality-based explanations in their approach to finance. Nonetheless, another mechanism, which is presented by Moseley (2011), is noteworthy. He draws attention to dynamics that resulted in excess surplus in the non-financial corporate sector and argues that those excess funds poured towards households with the mediation of banking sector. Since this causation does not necessitate attributing a secondary or complementary role to the finance, but it indicates possible real sector sources of funding, we argue that this mechanism should be taken into consideration while analyzing the transformations of the neoliberal period.

On the other hand, another stream of interpretation about profit rate patterns is presented by Basu and Vasudevan (2012). The difference of this study from the foregoing analyses is the weight of technological factors in explaining the trends of profit rates in the neoliberal period. These authors show that alongside distributional factors, technological developments, organizational transformations in the workplace or globalization have been effective on the recovery of profit rates after the 1970s until the beginning of the 2000s. Moreover, this study provides supportive evidence on the findings of Kotz (2009, 2011). Relying on these findings, we agree with the main idea of this study, which is that the crisis was not preceded by a trend of declining profitability in the long-run, but only was preceded by a short-term downward movement in profit rates associated with a business cycle fluctuation.

Above all, the study of Basu and Vasudevan (2012) show that this short-term downward movement in profit rates, which was associated with a business cycle as Kotz (2011) analyzed elaborately, coincided with the expiration of long-term favorable technological developments to profit rates. Thus, relying on the findings of this study and other evidences, we argue that given the favorable technological

changes went down in the late 1990s and given falling capital productivity in the 2000s driven by rising capital intensity (organic composition of capital), the ground for another structural crisis of capitalism was ready. Moreover, it seems that this decline in profit rates materialized despite ongoing favorable distributional trends throughout the 2000s. Nonetheless, we should note that the profit rate patterns had nothing to do with the characteristics of the recent crisis, i.e. the collapse of mortgage boom and high-level of financial and household leverage which was driven by three-decades-long financial deregulation process and the rapid developments in new financial products and practices. The profit rate patterns can only be linked to the deepness of recession. It should also be noted that the severe financial crisis of 2007/08 was capable of depressing real economic activity for a long time, however, we think that the coincidence of a severe financial crisis and declining capital productivity, thence the materialization of the tendency of the profit rate to fall in the second half of the 2000s could explain the deepness of the recession and post-crisis stagnation much better.

Hence, we conclude that developments and transformations in the real-side of the economy during the neoliberal period can be very useful to understand the underlying structural transformations that ended up with the most severe crisis since the Great Depression. Nonetheless, many of those foregoing arguments that tried to explain real-sector-based structural causes of the crisis seems weak because fundamentally of the way they followed while approaching financial-side developments. However, we think that Marxist theory provides a solid ground to analyze the contribution of contradictory inner mechanisms of capitalism to crises and to develop a theoretical framework which could include exclusive consequences of the financialization and neoliberal transformation, and which could use them to explain the underlying causes of the recent crisis. Although we do not develop such a framework in this thesis, our synthetic and eclectic interpretation for the crisis that will be summarized in the subsequent conclusion chapter can be read as an immature outline of such a framework.

## **CHAPTER 6**

### **CONCLUDING REMARKS: A SYNTHETIC EXPLANATION FOR THE CRISIS**

This study aims to comprehend the causes of the recent crisis in a coherent way by analyzing some of the prominent arguments in the literature. Thus far, we have elaborated on four distinctive approaches over the causes of the recent crisis. The general conclusion of this analysis is as follows: financial innovations, regulation and supervision failures, and perverse incentives explain the characteristics, contagion channels and timing of the crisis well. The depth of the financial crisis was related with system-wide leverage, accumulation of systemic risks and unleashing of self-reinforcing mechanisms of finance by three-decade long financial liberalization. Deep recession and subsequent stagnation can be related to the effect of financial crisis on the financial sector and household sector balance-sheets and declining profitability as a consequence of the structural problems of the US capitalism. On the other hand, monetary policy stance of the Federal Reserve seems less effective on credit boom determinants during the 2000s. Finally, global-imbalances-explanation of the crisis misinterprets the possible international sources of mortgage boom and financial excesses; and it exaggerates the role of developing countries in global financing patterns. In this concluding chapter, we summarize the fundamental points of our study in a synthetic explanation for the crisis.

The epicenter of the global financial crisis of 2007/08 was the United States economy. The financial crisis of the US can be characterized with three developments, in brief. First, it started with meltdown in subprime mortgage market

and the collapse of prices of the riskiest segments of subprime mortgage-backed securities in the first half of 2007. Secondly, with the effect of these developments and declining housing prices, some financial firms' balance-sheets were affected adversely, uncertainty increased and the atmosphere of mutual trust among financial firms started to evaporate. The first shock that induced the crisis for the whole financial system occurred in August, 2007, and was characterized as run on short-term wholesale funding markets, such as repo market and asset-backed commercial paper market. Such runs on wholesale funding markets, on mutual funds, on large investment banks continued during the 2007/08 crisis, bringing about more severe shocks to the financial system every time. Thirdly, these shocks led many financial institutions to come to the brink of collapse or led to effective insolvency or bankruptcy of many firms, including some of the largest ones. The last stage of the crisis can be characterized by severe deleveraging process, frozen credits and funds markets, injection of huge amount of rescue packages and a hard recession.

Firstly, subprime mortgage crisis was the low-end of a mortgage credit boom that lasted between 2001 and 2007, in which subprime mortgage lending reached to unprecedented amounts. Although the generation of mortgage boom can, indeed, be traced back to the mid-1990s; the 2000s have witnessed unprecedented rise in subprime lending and securitization of mortgage products. After 2006, those subprime mortgages started to default, again, in an unprecedented pace. These defaults can be explained by accompanying housing price deceleration after 2006, high household leverage (lowering down-payments, high loan-to-value ratio), the access of more risky borrowers to mortgage credits and deteriorated underwriting standards, lax screening of borrowers on their creditworthiness, and finally increasing debt-service burden for low- and middle-income households. Although some of these factors explain only cross-county differences in defaults, a general deterioration of lending standards throughout the boom period and accompanying rise in household leverage seems as the most important determinants of the unprecedented rise in mortgage defaults after 2006.

Alongside other factors, we argue that advancements in securitization of mortgage loans and especially the inclusion of subprime loans into this process after the mid-1990s by private financial institutions reserved a significant place in the origination of mortgage boom and the rise of subprime lending. By allowing off-loading originated loans from the balance-sheet of banks, securitization allowed liquidity in lending and contributed to the emergence of mortgage credit boom. Throughout the process, securitization also contributed to relaxing of lending standards and created incentives for avoiding of costly screening activities, especially in subprime mortgage market, which, in turn, prepared the ground for the deterioration of underwriting standards in subprime loans and their defaults gradually. In addition, subprime mortgage boom advanced hand-in-hand with increasing household leverage, which was another important determinant of subprime defaults. Despite insufficient evidence, we think that, by significantly contributing to mortgage credit boom, securitization might have been one of the most important underlying causes that created housing price boom, which, of course display self-reinforcing dynamics throughout the process.

Besides, demand-side of mortgage-backed financial products and some other financial innovations that facilitated the rise of subprime mortgage lending fed into mortgage boom, thence housing price boom. Firstly, demand for mortgage-backed securities that came from government-sponsored enterprises (GSEs), commercial banks and many components of shadow banks in the US and foreign demand for mortgage-related products played significant role in the rise of mortgage boom. Although it seems that GSEs role in creating demand for mortgage originations was very large, these institutions mostly focused on prime mortgages. The bulk of the demand for subprime mortgage origination came from private sector securitization vehicles. The ultimate source of the demand was again mostly private sector, including commercial banks, shadow banks (ABCP vehicles, SIVs, hedge funds, investment banks and so on) and European financial institutions. When securitization turned those risky mortgages into high-grade securities with higher yields relative to other assets in the markets, many types of financial institutions demanded them as a part of their investment strategies and this fed into mortgage boom and housing price

boom in the end. In addition to demand-side factors, some other financial innovations, such as many exotic types of mortgages, which facilitated acquiring mortgage loans for low- and middle- income groups completed the low-component of mortgage boom. Finally, another financial innovation, mortgage companies, helped large banks and bank holding companies to originate riskier loans by holding less, if any, capital against them, providing also shielding from the losses of such loans after the crisis. All in all, several financial innovations completed the needs of the origination of a mortgage boom throughout the process and increasing demand from financial institutions for the products of securitization pushed the process further.

Was there any role for the monetary policy stance of the Fed in these developments? The claim that easy monetary policy stance of the Fed contributed to housing boom and triggered the subprime mortgage collapse by tightening monetary policy does not seem as supported by the evidence. Several econometric analyses that regress both long term and short term (adjustable) mortgage rates on federal funds rate displays that the responsiveness of mortgage rates to monetary policy stance diminished gradually, especially after the starting of the 2000s and especially for long term mortgage rates. Moreover, considering a general rise in asset prices during the housing boom, and also the role of financial innovations and deregulations that provide easier access to credit for households and funding resources for financial institutions, it seems that balance-sheet and credit channels of monetary transmission mechanism have not worked as it was expected. For example, securitization of once-illiquid loans led to that funding constraints of banks have been less effective in the decision of mortgage origination. Since bank-lending channel of monetary policy works through the ability of central banks in raising funding costs, so making credit supply difficult, securitization rendered monetary policy bank-lending channel less effective throughout the process. Besides, the empirical literature also provides evidence on the inefficaciousness of macroeconomic factors in explaining the rapid rise of subprime mortgage markets, which implies that even if the Fed have been effective on those macroeconomic factors, monetary policy stance of the Fed could

not be effective on the specific developments of the recent credit boom, such as unprecedented rise in subprime mortgage lending.

Nevertheless, subprime mortgage boom and bust was only a part of the story and it does not help to explain how such a devastating wave of deleveraging materialized, how those large investment banks went into bankruptcy and how it caused system-wide trauma. A significant part of the answer lies in the rise of system-wide leverage and accumulation of devastating “tail risks” that materialized during the crisis.

First of all, we argue that increasing leverage of large commercial banks and investment banks created significant vulnerabilities in the financial system and this conditioned the deepness of deleveraging. During the recent boom period, investment banks increased their leverage after 2004 until the crisis, which was partly related with changing regulatory conditions on their leverage limits. Although large commercial banks’ leverage was concealed by the traditional measures of leverage, many of them were exposed to high level of effective leverage through their off-balance-sheet vehicles, against which they held only limited amount capital, which was, of course, a consequence of the regulatory arrangements on bank capital. Moreover, both balance-sheet expansion and off-balance-sheet activities of large commercial banks, and all activities of investment banks were financed through short-term wholesale funding markets, making the system vulnerable to huge amount of liquidity risk in the case of small shocks. This vulnerability to liquidity risk turned into reality when several runs on short-term borrowing markets materialized during the crisis.

Besides, for the largest banks and investment banks, the active management of balance-sheet and equity capital according to market prices of assets and perceived risks, created tendencies toward procyclical balance-sheet expansion or contraction and procyclical leverage. Asset price changes immediately influenced net worth of these large banks. Since they targeted either their risk-based equity capital or their leverage ratio, asset price increases that brought about surplus capital, required expansion of balance-sheets, which was materialized through short term-borrowing,

long-term lending and investing in securities. On the other hand, balance-sheet expansion and increasing leverage of financial firms (by the way, increasing leverage of households, too) have strong tendencies to put more pressure on asset prices. Thus, the cycle of feedback between asset prices and leverage becomes completed. This seems as one of the most important self-reinforcing feedback mechanisms that aggravated the accumulation of systemic risks during the boom. Since all these self-reinforcing feedback mechanisms can work in the inverse direction, the interaction between asset prices and balance-sheet size and leverage exacerbated the problems during the crisis, requiring self-reinforcing contraction of balance sheets and deleveraging during the crisis. What is more, inveterate practices arisen from short-term-performance based remuneration schemes of financial firms contributed to short-sightedness, excessive risk-taking and fed into procyclicality of balance-sheet size and leverage. These practices were also reinforced and perpetuated through competition among financial firms and consolidation of financial stock ownership within the financial system. Finally, it can be argued that credit default swaps played an important role at the last stage of the crisis by creating incentives for manipulations in the financial markets, affecting housing prices through subprime MBS-related credit default swaps, creating non-transparency, resolution or settlement problems and creating new contagion channels through making counterparty evaluation difficult.

In addition, those foregoing mechanisms help fulfilling our conclusions about housing price boom. In sum, we argue that housing prices soared mainly because of the mortgage credit boom that characterized by lowering lending standards and increasing household leverage throughout the process. Increasing household leverage fed into housing price boom. Besides, increasing financial firm leverage and the prices of mortgage-backed securities created another vicious circle that affect housing price boom through cheapening mortgage loans with the expansion of mortgage-backed security markets. Also, housing price boom fed into credit boom and created self-reinforcing dynamic through creating optimistic expectations about the longevity of housing price acceleration. In the end, the decline of housing prices was inevitable, not because of sudden changes in the psychological conditions of

market participants but mainly because of the inner boundaries of the credit boom, i.e. increasing defaults due to declining lending standards, accompanying high household leverage and increasing debt-service ratios, although psychological factors was also effective in some of those turning points. Considering that all these factors was, to a great extent, the products of financial liberalization process, financial innovations and new practices, we can argue that housing price boom was the product of financial liberalization, too.

All in all, we argue that financialization process of the last three decades which can be characterized by gradual deregulation, emergence of new financial practices and financial innovations, consolidation of perverse incentives and amplification of self-reinforcing feedback mechanisms was most likely the major underlying cause of the crisis. We counted some of the direct causes of the crisis above, which are financial innovations and self-reinforcing mechanisms mostly. However, they were also related with regulatory inconsistencies and failures and consolidated beliefs with regard to policymakers' actions, which were mostly the products of three-decade long deregulation process. Firstly, capital adequacy requirements set by Basel accords and national complementary regulations created incentives to establish off-balance-sheet vehicles and expand balance-sheets through investing in high-grade MBSs in order to exploit regulatory arbitrage and leverage effectively. Secondly, inefficient regulations and supervision of some firms, such as GSEs and large investment banks, contributed to excessive leverage in these firms and enhanced self-reinforcing feedback mechanisms by allowing for the avoidance of balance-sheet constraints. Thirdly, the lack of integration and consistency in the setup and implementation of banking regulations created a shadow banking sector, whose actions culminated in high leverage, oversize balance-sheets, and excessive risk-taking; and contributed to the development of mortgage credit boom. Fourth, repeated bailouts during the last decades contributed to the consolidation of the belief over that government would always step in when "too-big" or "systemically important" firms got hurt during the crisis, thence contributed to excessive risk-taking of these large firms. Fifth, regulations that bestowed privileged position to credit rating agencies resulted in that the interests of credit rating agencies were

aligned with both security issuers and security investors on inflated ratings, so contributed to excessive mispricing of risks, especially for mortgage-backed securities during the recent boom. Finally, although we did not focus on each of them in a detailed way in this thesis, the regulations that allowed especially large commercial banks to engage in financial mediation activities; and that supported consolidation of banking system, growing of large banks with mergers and acquisitions and expanding of their activities across the country should be counted among the most important factors that contributed to transformation of the US financial system during the last three decades.

Moreover, this deregulation and financial liberalization process that accompanied with the emergence of inconsistencies in the regulation framework was not only passed over by regulatory agencies and policymakers, but also they effectively did their best to push forward deregulation with the belief over the merits of self-regulation of financial firms. This was the case especially for the rise of mortgage companies, which effectively overleaped the regulation over depository institutions; or for the rise of excessive leverage through off-balance-sheet vehicles, which counteracted against on-balance-sheet capital adequacy requirements; or for the rise of leverage in investment banks, which was effectively delimited with the belief in the capacity of self-regulation in these banks.

Besides, although we argue that monetary policy stance of the Fed does not seem as one of the causes of the crisis, there is a role for the Fed, considering its regulatory and supervisory role and its approach towards deregulation process. With an optimistic interpretation, retrospectively, it can be said that the Fed's monetary policy benchmark, which aimed at influencing output and inflation through affecting the prices and amounts of financial instruments, was in contradiction with the method the Fed embraced for attaining financial stability, by which the Fed approved and supported several deregulation, believing in the benefits of "self-regulation" of financial institutions. We argue that the latter caused declining effectiveness of the Fed's ability to influence on the prices and amounts of financial assets. This process ended up with financial instability in the end. Considering these points, first, it may

not be fair to say that there was “monetary excess” due to the Fed’s monetary policy stance during the housing boom, because the Fed gave up controlling broader monetary aggregates at the end of a deregulation process and there are convincing evidences on declining responsiveness of these aggregates to the monetary policy stance because of financial deregulation and financial innovations. Second, we also argue that the Fed could not have succeeded in preventing the bubble because of the same reasons. Considering the self-reinforcing and evolving housing bubble from the mid-1990s, ever-increasing financial flows between countries, financial deregulations and innovations that empower the capacity of financial institutions in expanding their balance-sheets and making excessive profits at the cost of generating excessive systemic risks, the capability of the Fed in affecting asset prices and preventing bubbles might have been severely diminished. Moreover, the Fed policymakers might have contributed to the build-up of financial excesses because of their general belief in the asymmetric response to asset bubbles, i.e. passing by rising asset prices and intervening into the markets for only cleaning up the mess when the bubble burst. Thus, our conclusions bring into question not the monetary policy stance of the Fed, but its contradictory approach to its regulatory and supervisory role, its recklessness about deregulations and bubbles, and its supportive stance for deregulation process and self-regulation of financial institutions. We argue that if there is a role for the Fed in the build-up of financial excesses before the crisis, it should be investigated among its regulatory and supervisory responsibilities and in three-decades-long process of financial deregulation.

Although financial liberalization and accompanying developments in the financial sector were underlying causes of the recent crisis, in fact, they were also the products of a broader structural transformation in the US economy and in the world economy. This transformation was mainly characterized by the implementation of neoliberal policies and the emergence of neoliberal institutional structure. The basic features of this transformation for the US economy were the gradual deregulation process in real and financial sectors, privatization of many state services, the retreat of the state in active regulation of macroeconomy, reductions in social spending and taxes on business and wealth, attack on trade unions, enabling labor market

flexibility, unrestrained competition among large corporations, new competitive-based managerial practices (Kotz, 2008). Besides the features that directly related with the financial sector, all these changes have been interacted with financial sector developments in different ways. Moreover, these features of the neoliberal transformation facilitated or caused the transformation of the relationships between corporate sector and financial sector, and between household sector and financial sector. The transformation of these relationships was important for understanding the unprecedented rise in household sector indebtedness mainly associated with mortgage debt and the transformations in the practices of banking sector (Lapavitsas, 2009; 2010). On the other hand, this broader structural transformation was a response to and an outcome of the stagnation and the structural crisis of the 1970s that arose from the internal conflicts of capitalism. The US economy witnessed a prolonged stagnation that was arisen from a profitability crisis during the 1970s (Dumenil and Levy, 2011; Moseley, 2011; Shaikh, 2011). In order to overcome those structural problems, the US economy entered into a process of restructuring, in which gradual financial liberalization reserved a significant place. In our view, without taking into consideration of this broader structural transformation of the US economy and the world economy and without taking into consideration the causes of this transformation, the analysis of the underlying structural causes of the crisis is left half finished. Although we criticize some of the specific explanations of Marxist scholars on the causes of the crisis, we think that Marxist accounts provide most useful explanations and insights in order to comprehend the nature and the roots of the recent financial liberalization process.

Besides the role of explaining the recent financial liberalization process, we think that the structural (or institutional) transformation of the US economy and the world economy may also help to explain the depth of the recession and post-crisis stagnation. We analyzed two streams of explanations for the structural transformation of the US, which link them to the crisis by arguing that the recent crisis was a structural crisis. Neither aggregate-demand-based explanations nor profitability-based prominent explanations could give a coherent explanation for the direct links between structural transformations and the crisis, since they consider

financial sector developments as secondary or attribute only a functional role to them. We argue that financial sector developments could not be considered as only the means for alleviating the adverse effects of real sector developments since they have had own dynamics and a coherent explanation that focus on long-term underlying causes of the recent crisis should give equal weights both financial sector and real sector developments. We think that financial sector developments explain most of the causes of the recent crisis. Nonetheless, the transformation of the financial system was accompanied with the transformations in the relationships between financial sector and productive sector and between financial sector and households. Inasmuch as real-sector developments contributed to the transformation of these relationships, the analysis of them may be very helpful.

We identify five important real sector phenomena for the US economy considering the last three decades: (1) more or less stable (slightly declining) wage share in GDP as real wages stagnated throughout the period; (2) ever-increasing consumption share and two significant investment booms that occurred during the late 1990s and between 2004 and 2007; (3) more or stable trend of profit rates, which fell significantly only after 2004; (4) ever-decreasing rate of accumulation and the emergence of excess surpluses in the corporate sector as a consequence of (3) and (4); (5) declining trend of capacity utilization rate. We showed that aggregate-demand-based explanations could not explain many of these phenomena and call in financial sector developments for help by arguing that growing household indebtedness and increasing financial excesses was the result of increasing inequality that sourced from the growing gap of real wage and labor productivity. Although increasing income concentration might indeed have important effects on asset bubbles and credit booms, increasing household indebtedness was not caused by increasing inequality. It was mainly the result of supply-side developments in the mortgage market and financial markets. Thus, we can argue that the crisis does not seem as the result of structural demand weaknesses arisen from the severance of productivity-wage growth, despite its other important consequences.

However, we think that the deepness of the recession and post-crisis stagnation were related with profitability patterns, alongside financial factors, such as dry-up of credits to the real sector after banking sector was severely hit by the financial crisis and went into severe deleveraging process. We argue that when favorable technological changes went down in the late 1990s and capital productivity started to fall down rapidly in the 2000s with the rapid growth of capital intensity (organic composition of capital), despite the maintenance of favorable distributional factors throughout the 2000s, two-decade long stable trends of profit rates came to an end. The fall of profit rates started in 2004, when investment and consumption was just soaring. When the housing bubble burst in 2007, it depressed consumption and investment leaving huge excess capacity in manufacturing, which also depressed profit rates. All in all, although the recent global crisis was not preceded by a trend of declining profitability in the long-run, it was preceded by a short-term downward movement of profit rates associated with a business cycle fluctuation. Nonetheless, this downward-side of this business cycle was associated with the expiration of long-term favorable technological developments to profit rates. Considering that profit rates in the US have been below its mid-1960s throughout all subsequent decades – even when there was favorable technological developments between 1980 and 2000 and despite the three-decade long suppression of real wages- this short-term downward trend of profit rates might have remain devastating effects on real activity in the end. Nonetheless, we should note that the severe financial crisis of 2007/08 was surely capable of depressing real economic activity for a long time. What we argue here is that the coincidence of a severe financial crisis and declining capital productivity, thence the materialization of the tendency of the profit rate to fall in the second half of the 2000s could explain much better the deepness of the recession and post-crisis stagnation.

On the other hand, when we look at the possible international sources that could affect the housing boom and some other financial excesses, the most of the responsibility falls predominantly on the part of advanced European countries. When gross capital inflows to the US are analyzed, they show that advanced European countries and private sector were the major source of foreign financial flows to the

US. On the other hand, the empirical literature focuses mostly on net capital flows and finds significant explanatory power for them on declining long-term interest rates and term spreads, low mortgage rates, housing price acceleration and financial sector excesses, such as high-leverage. As a result, these findings are presented as evidence on the role of global imbalances (net capital flows) in explaining the crisis. This means that net capital outflows that generated by the East Asian developing countries, especially China, the oil-exporting countries, and Germany and Japan, were the global sources of the crisis. Moreover, an important part of this literature argues that deliberate policies of developing countries -such as undervaluation of domestic currencies or official reserve accumulation- and underdevelopment of their financial system resulted in the flow of savings of these countries to the US, alongside other deficit countries, thence contributing to the factors that culminated in the crisis.

However, we argue that both global imbalances and proximate causes of the crisis can be a consequence of the financial deregulation process in the US and effective financial innovations of the recent era, as opposed to the arguments that propose a causality running from global imbalances to the crisis. When financial innovations and deregulations paved the way for the generation of a credit boom, this can increase consumption and investment activities, precipitating the deterioration in current account position. When the process advances with its own dynamics, it can draw more foreign financial resources, further feeding into credit boom and deteriorating current account position. Thus, both global imbalances (net capital flows) and the crisis-driving factors may seem in correlation.

Moreover, as we discussed, net capital flows do not say anything about the sources of international financing. Relying on the conceptual difference between saving and finance, and its international counterpart -which is the difference between net flows and gross flows-, it can be shown that there seems very little role for the implications of any kind of global imbalances stories in the crisis. Although they imply the role of net capital flows and of surplus-running developing countries, these countries have only a negligible share among all gross inflows to the US. Although,

they imply the role of reserve accumulation of developing countries, again, there has only a minor share for official flows among gross capital inflows. Although they imply the underdevelopment of financial system in developing countries as one source of net flows, the bulk of gross flows were belong to advanced countries and the financial crisis was mostly related with financial relationships of advanced-countries. Finally, the outbreak of the crisis and its contagion channels show that both deficit- and surplus-countries in the advanced world were hit by the crisis nearly at the same time via the exposures of their large banks to the mortgage-related assets. This implies that the eruption of the crisis had nothing to do with global current account imbalances, but it had to with global banking systems and their significant exposure to substantial risks of the mortgage-related products. Thus, as opposed to the misinterpretation of global imbalances story on the international sources of the crisis, we argue that European countries played the major role among international sources of the build-up of financial imbalances, not developing countries.

Recapping, financial liberalization of the last three decades and accompanying developments in the financial sector of the US was the most important underlying causes of the crisis. This process was characterized mainly by gradual deregulation, the emergence of very effective financial innovations, the consolidation of perverse incentives and the enhancement of the capacity of self-reinforcing feedback mechanisms. All these explain the characteristics, contagion channels, the timing and the depth of the financial crisis. Nonetheless, deep recession and subsequent stagnation can be related to declining profitability in the real sector alongside the effects of financial crisis on the financial sector and household sector balance-sheets. However, monetary policy stance of the Federal Reserve does not seem as a an important contributing factor among the causes of the crisis. Finally, global-imbalances-explanation of the crisis misinterprets the possible international sources of mortgage boom and financial excesses. Although we relied on a relatively extensive literature to comprehend the causes of the recent crisis in a coherent way, our analysis have certainly limitations. Firstly, it does not refer to old theoretical discussions about the causes of the crisis, which is important in making a compact analysis of the causes of the crisis. Secondly, it lacks some of the important

arguments about the underlying causes of the recent crisis, such as some Post-Keynesian arguments that focuses mainly on financial sector developments while explaining the crisis. These arguments could be incorporated into the discussion about structural causes of the crisis. Thirdly, although we take a critical position against monetary-policy-based explanations and global-imbalances-based explanations and we make strong cases for the weaknesses of these approaches in explaining the causes of the crisis, our analysis needs to be elaborated at some points. For example, the possible effects of loose monetary policy stance of the Fed on financial vulnerabilities of the US through its contribution to global liquidity, through risk-taking channel and through facilitating borrowing in repo market needs to be analyzed in order to make robust conclusions. Also, although we make a case for the possible explanatory power of financial liberalization of the US for growing global imbalances, this case needs to be substantiated with an empirical analysis. Although we think that many points of this study requires further research to sharpen the main conclusions, the last two points above deserve special attention considering the prevalence of monetary-policy-based explanations and global-imbalances-based explanations. Fourthly, the main argument of this study takes financial sector developments into the center; however, we provide only a synthetic explanation for the role of gradual financial liberalization and accompanying developments in the crisis. A well-structured and well-clarified explanation needs to be developed in order to improve theoretical understanding of crises. Finally, this study purely attempts to comprehend the causes of the recent crisis. Therefore, it overlooks political implications of the main conclusions of this study. This requires further research in order to clarify possible political implications.

## REFERENCES

- Acharya, V. & P. Schanbl (2008). How banks played the leverage “game”?. November 21, 2008. Retrieved August 29, 2013, from [http://web-docs.stern.nyu.edu/salomon/docs/crisis/Leverage\\_WP\\_Final.pdf](http://web-docs.stern.nyu.edu/salomon/docs/crisis/Leverage_WP_Final.pdf)
- Acharya, V. & P. Schnabl (2009). Do Global Banks Spread Global Imbalances? The Case of Asset-Backed Commercial Paper During the Financial Crisis of 2007–09. *Paper presented at the 10th Jacques Polak Annual Research Conference Hosted by the International Monetary Fund*, Washington, DC—November 5–6, 2009.
- Adrian, T. & H-S Shin (2010). Liquidity and leverage. *Journal of Financial Intermediation*, Elsevier, vol. 19(3), pages 418-437, July.
- Aizenman, J. & Y. Jinjarak (2008). Current Account Patterns and National Real Estate Markets. *NBER Working Papers 13921*, National Bureau of Economic Research, Inc.
- Basu, V. & R. Vasudevan (2012). Technology, distribution and the rate of profit in the US economy: understanding the current crisis. *Cambridge Journal of Economics*, Oxford University Press. doi:10.1093/cje/bes035.
- Bernanke, B. (2002). Asset-Price "Bubbles" and Monetary Policy. *Remarks Before the New York Chapter of the National Association for Business Economics*, New York, October 15, 2002.
- Bernanke, B. (2005). The Global Saving Glut and the US Current Account Deficit. *Speech at the Homer Jones Lecture*, St. Louis, Missouri, April 14, 2005.
- Bernanke, B. (2007). Global Imbalances: Recent Developments and Prospects. *Speech at the Bundesbank Lecture*, Berlin, Germany, September 11, 2007.
- Bernanke, B. (2009). Financial Reform to Address Systemic Risk. *Speech at the Council on Foreign Relations*, Washington, D.C. March 10, 2009.
- Bernanke, B. (2010a). Monetary Policy and the Housing Bubble. *Speech at Annual Meeting of the American Economic Association*, Atlanta, Georgia, January 2010.

- Bernanke, B. (2010b). Causes of the Recent Financial and Economic Crisis. *Before the Financial Crisis Inquiry Commission*, Washington, D.C. September 2, 2010.
- Bernanke, B. (2011). Global imbalances – links to economic and financial stability. *Speech at the Banque de France Financial Stability Review Launch Event*, Paris, 18 February 2011.
- Bernanke, B & M. Gertler (2001). Should Central Banks Respond to Movements in Asset Prices?. *The American Economic Review*, Vol. 91, No. 2, Papers and Proceedings of the Hundred Thirteenth Annual Meeting of the American Economic Association. (May, 2001), pp. 253-257.
- Berrone, P. (2008). Current Global Financial Crisis: An incentive problem. *IESE Occasional Papers*, OP-158, October, 2008.
- BIS (2009). Report on Special Purpose Entities. Basel Committee on Banking Supervision, The Joint Forum, Bank for International Settlements. Retrieved August 29, 2013, from <http://www.bis.org/publ/joint23.pdf>
- Biggs, M. & T. Mayer (2012). How Central Banks contributed to the financial crisis. Retrieved August 29, 2013, from <http://www.voxeu.org/article/how-central-banks-contributed-financial-crisis>
- Bordo, M. D. & Meissner, Christopher M. (2012). Does inequality lead to a financial crisis?. *Journal of International Money and Finance*, Elsevier, vol. 31(8), pages 2147-2161.
- Borio, C. (2012). The financial cycle and macroeconomics: What have we learnt?. *BIS Working Papers* 395, Bank for International Settlements.
- Borio, C. & P. Disyatat (2011). Global imbalances and the financial crisis: Link or no link?. *BIS Working Papers* 346, Bank for International Settlements.
- Borio, C. & H. Zhu (2008). Capital regulation, risk-taking and monetary policy: a missing link in the transmission mechanism?. *BIS Working Papers* 268, Bank for International Settlements.
- Brenner, R. (2002). *The Boom and The Bubble: the US in the world economy*. London: Verso.
- Brenner, R. (2006). *The Economics of Global Turbulence: the Advanced Capitalist Economies from Long Boom to Long Downturn, 1945- 2005*. London: Verso.
- Brenner, R. (2009). What is Good for Goldman Sachs is Good for America The Origins of the Present Crisis. *Institute for Social Science Research, Working Paper Series qt0sg0782h*, Institute for Social Science Research, UCLA.

- Brunnermeier, M. K. (2009). Deciphering the Liquidity and Credit Crunch 2007-2008. *Journal of Economic Perspectives*, American Economic Association, vol. 23(1), pages 77-100, Winter.
- Caballero, R. J. & A. Krishnamurthy (2009). Global Imbalances and Financial Fragility. *NBER Working Papers 14688*, National Bureau of Economic Research, Inc.
- Calomiris, C. W. (2009). Financial Innovation, Regulation, and Reform. *Cato Journal*, Cato Institute, vol. 29(1), pages 65-91, Winter.
- Chomsisengphet, S. & A. Pennington-Cross (2006). The evolution of the subprime mortgage market. *Review*, Federal Reserve Bank of St. Louis, issue Jan, pages 31-56.
- Cooper, R. N. (2005). Living with Global Imbalances: A Contrarian View. *Policy Briefs PB05-03*, Peterson Institute for International Economics.
- Cooper, R. N. (2007). Living with Global Imbalances. *Brookings Papers on Economic Activity*, Economic Studies Program, The Brookings Institution, vol. 38(2), pages 91-110.
- Corden, M. (2011). Global imbalances and the paradox of thrift. *CEPR Policy Insight No. 54*, April 2011.
- Cömert, H. (2012). Decoupling between the Federal Funds Rate and Long-term Interest Rates: Decreasing Effectiveness of Monetary Policy in the U.S. *PERI Working Paper Series*, No. 295, October 2012.
- Cömert, H. (2013). *Central Banks and Financial Markets, The Declining Power of US Monetary Policy*. Northampton, MA: Edward Elgar.
- Crotty, J. (2009). Structural causes of the global financial crisis: a critical assessment of the 'new financial architecture'. *Cambridge Journal of Economics* 2009, 33, 563-580.
- Crotty, J. (2011). The Bonus-Driven "Rainmaker" Financial Firm: How These Firms Enrich Top Employees, Destroy Shareholder Value and Create Systemic Financial Instability. *PERI Working Paper Series*, No. 209, June 2011.
- Crotty, J. & G. Epstein (2009). Avoiding Another Meltdown. *Challenge*, vol. 52, no. 1, January/February 2009, pp. 5-26.
- Cuomo, A. (2009). No Rhyme or Reason: The 'Heads I Win, Tails You Lose' Bank Bonus Culture. Retrieved August 29, 2013, from [http://www.oag.state.ny.us/media\\_center/2009/july/pdfs/Bonus%20Report%20Final%207.30.09.pdf](http://www.oag.state.ny.us/media_center/2009/july/pdfs/Bonus%20Report%20Final%207.30.09.pdf).

- D'Arista, J. (2009). Setting an Agenda for Monetary Reform. *PERI Working Paper Series*, No. 190, January 2009.
- Dell'Ariccia, G., L. Laeven & D. Igan (2008). Credit Booms and Lending Standards: Evidence from the Subprime Mortgage Market. *IMF Working Papers 08/106*, International Monetary Fund.
- Desroches, B. & M. Francis (2007). World Real Interest Rates: A Global Savings and Investment Perspective. *Working Papers 07-16*, Bank of Canada.
- Demyanyk, Y. (2009). Ten Myths about Subprime Mortgages. *Economic Commentary*, 07.23.09. Retrieved August 29, 2013, from [www.clevelandfed.org/research/commentary/2009/0509.cfm](http://www.clevelandfed.org/research/commentary/2009/0509.cfm)
- Demyanyk, Y. & E. Loutskina (2012). Mortgage companies and regulatory arbitrage. *Working Paper 1220R*, Federal Reserve Bank of Cleveland.
- Demyanyk, Y. & O. Van Hemert (2008). Understanding the Subprime Mortgage Crisis. Retrieved August 29, 2013, from <http://ssrn.com/abstract=1020396>
- Diamond, D.W. & R. Rajan (2009). The Credit Crisis: Conjectures about Causes and Remedies. *NBER Working Papers 14739*, National Bureau of Economic Research, Inc.
- Doms, M., F. Furlong & J. Krainer (2007). House Prices and Subprime Mortgage Delinquencies. *FRBSF Economic Letter*, Number 2007-14, June 8, 2007.
- Dodd, R. (2007). Subprime: Tentacles of a Crisis. *Finance & Development*, December 2007, 15-19.
- Dodd, R. (2010). Backgrounder: Derivatives. Retrieved August 29, 2013, from [http://www2.gsb.columbia.edu/ipd/j\\_derivatives.html](http://www2.gsb.columbia.edu/ipd/j_derivatives.html)
- Dooley, M. P., D. Folkerts-Landau & P. Garber (2003). An Essay on the Revived Bretton Woods System. *NBER Working Papers 9971*, National Bureau of Economic Research, Inc.
- Dooley, M.P., D. Folkerts-Landau & P. Garber (2004). The Revived Bretton Woods System: The Effects of Periphery Intervention and Reserve Management on Interest Rates and Exchange Rates in Center Countries. *NBER Working Papers 10332*, National Bureau of Economic Research, Inc., March 2004.
- Dooley, M.P., D. Folkerts-Landau & P. Garber (2005a). Savings Gluts and Interest Rates: The Missing Link to Europe. *NBER Working Papers 11520*, National Bureau of Economic Research, Inc., July 2005.

- Dooley, M.P., D. Folkerts-Landau & P. Garber (2005b). Interest Rates, Exchange Rates and International Adjustment. *NBER Working Papers 11771*, National Bureau of Economic Research, Inc., November 2005.
- Dumenil, G. & D. Levy (2011). The Crisis of the Early 21st Century: A Critical Review of Alternative Interpretations. Retrieved August 29, 2013, from <http://www.jourdan.ens.fr/levy/>
- Dumenil, G. & D. Levy (2012a). Being Post-Keynesian in the Medium Term and Classical- Marxian in the Long Term?. Retrieved August 29, 2013, from <http://www.jourdan.ens.fr/levy/>
- Dumenil, G. & D. Levy (2012b). The Crisis of the Early 21st Century: Marxian perspectives. Retrieved August 29, 2013, from <http://www.jourdan.ens.fr/levy/>
- Dymski, G. A. (2009). Racial Exclusion and the Political Economy of the Subprime Crisis. *Research on Money and Finance*, Discussion Paper No 1., February 15, 2009.
- Evans, T. (2010). Five explanations for the international financial crisis. *Working Paper, Institute for International Political Economy Berlin, No. 08/2010*.
- Fostel, A. & J. Geanakoplos (2011). Tranching, CDS and Asset Prices: How Financial Innovation Can Cause Bubbles and Crashes. *Cowles Foundation Discussion Papers 1809*, Cowles Foundation for Research in Economics, Yale University.
- Foster, J. B. (2008). The Financialization of Capital and the Crisis. Retrieved August 29, 2013, from <http://monthlyreview.org/2008/04/01/the-financialization-of-capital-and-the-crisis>
- Foster, J.B. & R.W. McChesney (2009). Monopoly-Finance Capital and the Paradox of Accumulation. Retrieved August 29, 2013, from <http://monthlyreview.org/2009/10/01/monopoly-finance-capital-and-the-paradox-of-accumulation>
- Foster, J.B. & R.W. McChesney (2010). Listen Keynesians, It's the System! Response to Palley. Retrieved August 29, 2013, from <http://monthlyreview.org/2010/04/01/listen-keynesians-its-the-system-response-to-palley>
- Frankel, J. (2007). Nine Reasons We Are Given Not to Worry About the US Deficits. *Commission on Growth and Development workshop on Global Trends and Challenges*, Yale University, September 2007.

- French, K.R., M.N. Baily, J.Y. Campbell, J.H. Cochrane, D.W. Diamond, D. Duffie, A.K. Kashyap, F.S. Mishkin, R.G. Rajan, D.S. Scharfstein, R.J. Shiller, H.S. Shin, M.J. Slaughter, J.C. Stein & R.M. Stulz (2010). *The Squam Lake Report, Fixing the Financial System*. Princeton University Press: Princeton and Oxford.
- Freund, C. (2010). Adjustment in global imbalances and the future of trade growth. In S. Claessens, S. Evenett and B. Hoekman (eds.), *Rebalancing the Global Economy: A Primer for Policymaking*, VoxEU.org publication, pp. 11-22.
- Geanakoplos, J. (2009). The Leverage Cycle. *Cowles Foundation Discussion Papers 1715*, Cowles Foundation for Research in Economics, Yale University.
- Geanakoplos, J. (2010). Solving the present crisis and managing the leverage cycle. *Economic Policy Review*, Federal Reserve Bank of New York, issue Aug, pages 101-131.
- Gorton, G. & A. Metrick (2010). Securitized Banking and the Run on Repo. Retrieved August 29, 2013, from <http://ssrn.com/abstract=1440752>
- Green, R. (2007). Lehman Shuts Unit; Toll of Lenders Tops 100: Subprime Scorecard. Aug 23, 2007. Retrieved August 29, 2013, from [www.bloomberg.com/apps/news?pid=21070001&sid=aQBUrPcefMtc](http://www.bloomberg.com/apps/news?pid=21070001&sid=aQBUrPcefMtc)
- Greenspan, A. (2004). Risk and Uncertainty in Monetary Policy. *Remarks at the Meetings of the American Economic Association, San Diego, California*, January 3, 2004.
- Greenspan, A. (2008). A Response to My Critics. *Financial Times*, April 6, 2008.
- Greenspan, A. (2009). The Fed Didn't Cause the Housing Bubble. *Wall Street Journal*, March 11, 2009.
- Greenspan, A. (2010a). The Crisis. *Brookings Papers on Economic Activity*, 2010 (1), pp. 201-246.
- Greenspan, A. (2010b). Testimony of Alan Greenspan, Financial Crisis Inquiry Commission. Retrieved August 29, 2013, from [http://fcic-static.law.stanford.edu/cdn\\_media/fcic-testimony/2010-0407-Greenspan.pdf](http://fcic-static.law.stanford.edu/cdn_media/fcic-testimony/2010-0407-Greenspan.pdf)
- Gruber, J. W. & S. B. Kamin (2008). Do differences in financial development explain the global pattern of current account imbalances?. *International Finance Discussion Papers 923*, Board of Governors of the Federal Reserve System (U.S.).
- Hirtle, B. (2009). Credit derivatives and bank credit supply. *Journal of Financial Intermediation*, Elsevier, vol. 18(2), pp 125-150, April.

- Henderson, D.R. & J.G. Hummel (2008). Greenspan's Monetary Policy in Retrospect, Discretion or Rules?. *Cato Institute Briefing Papers, No 109*, November 3, 2008
- IMF (2005). Global Imbalances: A Saving and Investment Perspective. *World Economic Outlook*, Chapter 2, September 2005.
- IMF (2006a). Oil Prices and Global Imbalances. *World Economic Outlook*, Chapter 2, April 2006.
- IMF (2006b). Awash With Cash: Why Are Corporate Savings So High?. *World Economic Outlook*, Chapter 4, April 2006.
- Itoh, M. & C. Lapavistas (2012 [1999]). *Para ve Finansın Ekonomi Politiği*. 1<sup>st</sup> Ed., İstanbul: Yordam Kitap [*Political Economy of Money and Finance*, London: Palgrave Macmillan].
- Kalemlı-Ozcan, S., B. Sorensen & S. Yesiltas (2012). Leverage across firms, banks, and countries. *Journal of International Economics*, Elsevier, vol. 88(2), pages 284-298.
- Keys, B. J., T. Mukherjee, A. Seru, & V. Vig (2008). Did Securitization Lead to Lax Screening? Evidence From Subprime Loans. Retrieved August 29, 2013, from <http://ssrn.com/abstract=1093137>
- King, M. (2010). Speech at the University of Exeter on Tuesday 19 January 2010. Retrieved August 29, 2013, from <http://www.bankofengland.co.uk/publications/Documents/speeches/2010/speech419.pdf>
- Kotz, D. M. (2008). The Financial and Economic Crisis of 2008: A Systemic Crisis of Neoliberal Capitalism. *Paper written for a panel on "The Global Financial Crisis: Heterodox Perspectives," sponsored by the Union for Radical Political Economics at the Allied Social Science Associations annual convention, San Francisco, January 4, 2009.*
- Kotz, D. M. (2009). Economic Crisis and Institutional Structures: A Comparison of Regulated and Neoliberal Capitalism. In Jonathan Goldstein and Michael Hillard (eds), *Heterodox Macroeconomics: Keynes, Marx and Globalization*. London and New York: Routledge, 176- 88.
- Kotz, D. M. (2011). Over-Investment and the Economic Crisis of 2008. Retrieved August 29, 2013, from [http://people.umass.edu/dmkotz/OverInvestment\\_and\\_the\\_Crisis\\_11\\_01.pdf](http://people.umass.edu/dmkotz/OverInvestment_and_the_Crisis_11_01.pdf)
- Krugman, P. (2009). *The Return of Depression Economics and the Crisis of 2008*. 1st Ed., New York: W. W. Norton and Company.

- Kuttner, K. N. & P. C. Mosser (2002). The Monetary Transmission Mechanism: Some answers and further questions. *Federal Reserve Bank of New York Economic Policy Review*, 8 (1), pp. 15-26.
- Lapavitsas, C. (2009). Financialised Capitalism: Crisis and Financial Expropriation. *Research on Money and Finance*, Discussion Paper No 1., February 15, 2009.
- Lapavitsas, C. (2010). Financialisation and Capitalist Accumulation: Structural Accounts of the Crisis of 2007-9. *Research on Money and Finance*, Discussion Paper No 16., February, 2010.
- Lapavitsas, C., A. Kaltenbrunner, D. Lindo, J. Michell, J.P. Paineira, E. Pires, J. Powell, A. Stenfors, & N. Teles (2010). Eurozone Crisis: Beggar Thyself and Thy Neighbour. *RMF (Research on Money and Finance) occasional report*, March 2010.
- Legg, A., N. Prasad & T. Robinson (2007). Global Imbalances and the Global Saving Glut – A Panel Data Assessment. *RBA Research Discussion Papers rdp2007-11*, Reserve Bank of Australia.
- Levine, R. (2010). An Autopsy of the US Financial System. *NBER Working Paper*, no.15956, April 2010
- Loutskina, E. & P. Strahan (2008). Securitization and the Declining Impact of Bank Financial Condition on Loan Supply: Evidence from Mortgage Acceptance Rates. *Paper presented at the Financial Cycles, Liquidity, and Securitization Conference Hosted by the International Monetary Fund*, Washington, DC—April 18, 2008.
- Lysandrou, P. (2009). Global Inequality and the Global Financial Crisis: The New Transmission Mechanism. Retrieved August 29, 2013, from [http://www.boeckler.de/pdf/v\\_2009\\_10\\_30\\_lysandrou.pdf](http://www.boeckler.de/pdf/v_2009_10_30_lysandrou.pdf)
- Merrouche, O. & E. Nier (2010). What Caused the Global Financial Crisis - Evidence on the Drivers of Financial Imbalances 1999 – 2007. *IMF Working Papers 10/265*, International Monetary Fund.
- Mian, A. R. & A. Sufi (2008). The Consequences of Mortgage Credit Expansion: Evidence from the U.S. Mortgage Default Crisis. (December 12, 2008). Retrieved August 29, 2013, from <http://ssrn.com/abstract=1072304>.
- Mishkin, F.S. (1991). Anatomy of a Financial Crisis. *NBER Working Papers 3934*, National Bureau of Economic Research, Inc.
- Mishkin, F. S. (2007). Housing and the Monetary Transmission Mechanism. *NBER Working Paper*, No. 13518, October 2007.

- Mishkin, F. S. (2008). How Should We Respond to Asset Price Bubbles?. *Financial Stability Review*, Banque de France, issue 12, pages 65-74, October.
- Mishkin, F. S. (2010). Over The Cliff: From the Subprime to the Global Financial Crisis. *NBER Working Papers 16609*, National Bureau of Economic Research, Inc.
- Mishkin, F.S. & S. G. Eakins (2012). *Financial Markets and Institutions*. 7th Ed., Pearson Education.
- Moench, E., J. Vikery & D. Aragon (2010). Why Is the Market Share of Adjustable-Rate Mortgages So Low?. *Federal reserve Bank of New York Current Issues in Economics and Finance*, Volume 16, Number 8, December 2010.
- Moseley, F. (2011). The U.S. Economic Crisis. *International Journal of Political Economy*, M.E. Sharpe, Inc., vol. 40(3), pages 59-71, October.
- O'Driscoll Jr., J. P. (2009). What Savings Glut?. *Wall Street Journal*, March 27, 2009.
- Obstfeld, M. & K. Rogoff (2009). Global Imbalances and the Financial Crisis: Products of Common Causes. *Paper prepared for the Federal Reserve Bank of San Francisco Asia Economic Policy Conference*, Santa Barbara, CA, October 18-20, 2009.
- Özatay, F (2011a). *Finansal Krizler ve Türkiye*. 3th Ed., Istanbul: Doğan Kitap.
- Özatay, F. (2011b). *Parasal İktisat: Kuram ve Politika*. 2th Ed., Ankara: Efil Yayınevi.
- Painceira, J. P. (2009). Developing Countries in the Era of Financialisation: From Deficit Accumulation to Reserve Accumulation. *Research on Money and Finance*, Discussion Paper No 4., February 15, 2009.
- Palley, T. I. (2009). America's exhausted paradigm: Macroeconomic causes of the financial crisis and great recession. *Working Paper, Institute for International Political Economy Berlin*, No. 02/2009.
- Palley, T. I. (2010). The Limits of Minsky's Financial Instability Hypothesis as an Explanation of the Crisis. Retrieved August 29, 2013, from <http://monthlyreview.org/2010/04/01/the-limits-of-minskys-financial-instability-hypothesis-as-an-explanation-of-the-crisis>
- Patnaik, P. (2010). The Theory of the Global 'Savings Glut'. Retrieved August 29, 2013, from <http://mrzine.monthlyreview.org/2010/patnaik010310.html>

- Portes, R. (2009). Global Imbalances. In M. Dewatripont, X. Freixas and R. Portes (eds.), *Macroeconomic Stability and Financial Regulation: Key Issues for the G20*, CEPR Publication. Retrieved August 29, 2013, from [http://www.ssc.wisc.edu/~mchinn/dewatripont\\_G20\\_ebook.pdf](http://www.ssc.wisc.edu/~mchinn/dewatripont_G20_ebook.pdf).
- Posner, R. A. (2009). A Failure of Capitalism: Reply to Alan Greenspan. *The Atlantic*. Retrieved August 29, 2013, from <http://www.theatlantic.com/business/archive/2009/05/a-failure-of-capitalism-reply-to-alan-greenspan/18161/>
- Rajan, R. (2005). Has Financial Development Made the World Riskier?. Retrieved August 29, 2013, from <http://www.kansascityfed.org/publicat/sympos/2005/pdf/rajan2005.pdf>
- Reinhart, C. M. & K. Rogoff (2009). *This Time Is Different: Eight Centuries of Financial Folly*. Princeton: Princeton University Press.
- Resnick, S. & R. Wolff (2010). The Economic Crisis: A Marxian Interpretation. *Rethinking Marxism: A Journal of Economics, Culture & Society*, 22:2, pp.170-186.
- Romer, C. D. (2009). Back from the Brink. *Speech at Federal Reserve Bank of Chicago*, Chicago, Illinois, September 24, 2009.
- Roubini, N. (2006). Why Central Banks Should Burst Bubbles?. *International Finance* 9:1, 2006: pp. 87–107.
- Roubini, N. (2008). Global Imbalances: a contemporary ‘Rashomon’ saga. In J-P Touffot (ed), *Central Banks as Economic Institutions*, Cheltenham: Edward Elgar, pp.162-176.
- Roubini, N. & B. Setser (2005). Will the Bretton Woods 2 Regime Unravel Soon? The Risk of a Hard Landing in 2005-2006. *Paper written for the Symposium on the “Revived Bretton Woods System: A New Paradigm for Asian Development?” organized by the Federal Reserve Bank of San Francisco and UC Berkeley*, San Francisco, February 4th, 2005.
- Sa, F., P. Towbin & T. Wieladek (2011). Low interest rates and housing booms: the role of capital inflows, monetary policy and financial innovation. *Bank of England working papers 411*, Bank of England.
- Sa, F. & T. Wieladek (2010). Monetary policy, capital inflows and the housing boom. *Bank of England working papers 405*, Bank of England.
- Sachs, J. (2008). Fed's failures behind US financial crisis. *China Daily*, June 19, 2008.

- Schwartz, A. J. (2009). Origins of the financial market crisis of 2008. *Cato Journal*, 29 (1), pp. 19-23.
- Setterfield, M. (2010). Real Wages, Aggregate Demand, and the Macroeconomic Travails of the US Economy: Diagnosis and Prognosis. *Working Papers 1005*, Trinity College, Department of Economics.
- Shaikh, A. (2011). The First Great Depression of the 21<sup>st</sup> Century. *Socialist Register 2011: The Crisis This Time*, Vol. 47, pp. 44-63.
- Sinn, H-W, J. Hassler, G. Saint-Paul, G. Corsetti, M.P. Devereux, T. Jenkinson, J-E. Sturm & X. Vives (2009). Chapter 2: The Financial Crisis. *EEAG Report on the European Economy 2009*, 2009, 59-122.
- Smaghi, L. B. (2008). The financial crisis and global imbalances – two sides of the same coin. *Speech at the Asia Europe Economic Forum conference “The Global Financial Crisis: Policy choices in Asia and Europe”*, Beijing, 9 December 2008.
- Snowdon, B. & H. R. Vane (2005). *Modern Macroeconomics, Its Origins, Development and Current State*. Northampton, MA: Edward Elgar.
- Stiglitz, J. E. (2009). Interpreting the Causes of the Great Recession of 2008. *Lecture to have been delivered at BIS Conference, Basel*, June, 2009.
- Stockhammer, E. (2012). Rising Inequality as a Root Cause of the Present Crisis. *PERI Working Paper Series*, No. 282, April 2012.
- Stulz, R. M. (2010). Credit Default Swaps and the Credit Crisis. *Journal of Economic Perspectives*, American Economic Association, vol. 24(1), pages 73-92, Winter.
- Taylor, J.B. (2007). Housing and Monetary Policy. *NBER Working Paper No. 13682*, December 2007.
- Taylor, J. B. (2009). The Financial Crisis and the Policy Responses: An Empirical Analysis of What Went Wrong. *NBER Working Paper No. 14631*, January 2009.
- Wallison, P.J. (2009). Deregulation and the Financial Crisis: Another Urban Myth. *American Enterprise Institute for Public Policy Research*, October, 2009. Retrieved August 29, 2013, from <http://www.aei.org/article/economics/financial-services/banking/deregulation-and-the-financial-crisis/>
- Wallison, J. (2010). Government Housing Policy and the Financial Crisis. *Cato Journal*, Cato Institute, vol. 30(2), pages 397-406, Spring.

- Warnock, F.A & V.C. Warnock (2009). International capital flows and U.S. interest rates. *Journal of International Money and Finance*, Elsevier, 28 (2009) 903–919.
- Wisman, J.D. (2013). Wage stagnation, rising inequality and the financial crisis of 2008. *Cambridge Journal of Economics*, Oxford University Press, vol. 37(4), pp 921-945.
- Wolf, M. (2008). Why Greenspan Does Not Bear Most of the Blame. *Financial Times*, April 8, 2008.
- Wolfson, H. M. & D. M. Kotz (2009). A Re-conceptualization of SSA Theory. *Paper written for Terrence McDonough, Michael Reich, and David M. Kotz (eds), Contemporary Capitalism and Its Crises: Social Structure of Accumulation Theory for the Twenty-First Century*, Cambridge: Cambridge University Press, 2010.
- Zywicki, T. J. (2009). Low Rates Led to ARMs. *Wall Street Journal*, March 27, 2009.

## TEZ FOTOKOPİSİ İZİN FORMU

### ENSTİTÜ

Fen Bilimleri Enstitüsü	<input type="checkbox"/>
Sosyal Bilimler Enstitüsü	<input checked="" type="checkbox"/>
Uygulamalı Matematik Enstitüsü	<input type="checkbox"/>
Enformatik Enstitüsü	<input type="checkbox"/>
Deniz Bilimleri Enstitüsü	<input type="checkbox"/>

### YAZARIN

Soyadı : DÜZÇAY  
Adı : GÜNEY  
Bölümü : İKTİSAT

**TEZİN ADI** (İngilizce) : A CRITICAL SURVEY ON FOUR  
DISTINCTIVE APPROACHES OVER THE CAUSES OF THE CRISIS

**TEZİN TÜRÜ** : Yüksek Lisans  Doktora

1. Tezimin tamamından kaynak gösterilmek şartıyla fotokopi alınabilir.
2. Tezimin içindekiler sayfası, özet, indeks sayfalarından ve/veya bir bölümünden kaynak gösterilmek şartıyla fotokopi alınabilir.
3. Tezimden bir bir (1) yıl süreyle fotokopi alınamaz.

**TEZİN KÜTÜPHANEYE TESLİM TARİHİ:**