THE NATURE OF FINANCIAL INNOVATIONS:
A POST-SCHUMPETERIAN ANALYSIS

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

BY

PELİN BULGURLUOĞLU

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR
THE DEGREE OF MASTER OF SCIENCE
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.

_____

Dr. Çınla Akdere
Supervisor

Examining Committee Members (first name belongs to the chairperson of the jury and the second name belongs to supervisor)

Prof. Dr. Erkan Erdil (METU, Econ) _____

Dr. Çınla Akdere (METU, Econ) _____

Asst. Prof. Derya Güler Aydın (HÜ, 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 :

Signature :

ABSTRACT

THE NATURE OF FINANCIAL INNOVATIONS:
A POST-SCHUMPETERIAN ANALYSIS

Bulgurluoğlu, Pelin
M.S. Department of Economics
Supervisor: Dr. Çınla Akdere

August 2013, 81 pages

This thesis analyzes the nature of financial innovations by taking a post-Schumpeterian approach. The aim of this thesis is to show that Schumpeter's analysis of entrepreneurial innovation, which takes place in the real economy, proposes also a theoretical framework for understanding the dynamics of financial innovations. Therefore, it suggests that Schumpeterian notion of innovation can be used as a guide in analyzing the dynamics of financial innovations today. In this respect, through the analysis of financial innovations, this thesis should be considered as a post-Schumpeterian description of the evolution of the capitalist system.

Keywords: Joseph A. Schumpeter, financial innovation, creative destruction, entrepreneurship, capitalism

ÖZ

FİNANSAL YENİLİKLERİN DOĞASI:
POST-SCHUMPETERCİ ANALİZ

Bulgurluoğlu, Pelin
Yüksek Lisans, İktisat Bölümü
Tez Yöneticisi: Dr. Çınla Akdere

Ağustos 2013, 81 sayfa

Bu tez, post-Schumpeterci bir yaklaşım ele alarak finansal yeniliklerin doğasını analiz etmektedir. Bu tezin amacı, Schumpeter'in reel ekonomide yer alan girişimci yenilik analizinin aynı zamanda finansal yeniliklerin dinamiğinin anlaşılması için teorik bir çerçeve sunuyor olduğunu göstermektir. Bu yüzden bu tez, Schumpeter'in yenilik kavramının, bugünün finansal yeniliklerinin dinamiği analizinde bir rehber olarak kullanılabileceği fikrini ileri sürmektedir. Bu açıdan bu tez, finansal yeniliklerin analizi üzerinden, kapitalist sistemin evriminin post-Schumpeterci bir tanımlanması olarak değerlendirilmelidir.

Anahtar kelimeler: Joseph A. Schumpeter, finansal yenilik, yaratıcı yıkım, girişimcilik, kapitalizm

To My Beloved Grandfather

ACKNOWLEDGMENTS

This thesis would not have been possible without the guidance, support and encouragement of many people, who I hope to acknowledge in this section.

Foremost, I would like to express my deepest gratitude to my supervisor, Dr. Çınla Akdere, for her guidance, valuable advices and encouragement throughout this thesis. She fully motivated me in reaching various academic achievements which I consider to be among the greatest experiences in my life.

I owe my special thanks to Prof. Dr. Fikret Şenses, from whose life and academic experiences I learned a lot. Without his teaching on academic writing, it would also be very hard to begin this thesis.

I also take this opportunity to thank to my undergraduate professor, Assoc. Prof. Gökçer Özgür. I feel lucky and honored to have learned from his intellectual debt. Discussions with Asst. Prof. Dr. Derya Güler Aydın, committee member, on Schumpeter have also been illuminating.

During the writing of this thesis, there were times when I felt down about its completion. I would like to thank my very special friends, for always cheering me up and showing their support at such times. I also appreciate sharing the experience of being a master degree student with Deniz Plevneli.

Most importantly, I want to give my special thanks to my beloved parents, especially my mom and brother, for their endless love, support and always having faith in me.

Last but not least, I want to thank my colleagues for granting me the necessary privilege and encouragement to complete this thesis.

TABLE OF CONTENTS

LIST OF TABLES

TABLES

LIST OF FIGURES

FIGURES

CHAPTER 1

INTRODUCTION

One of the bedrocks of our financial system is financial innovation, the life blood of efficient and responsive capital markets.

(Van Horne, 1985, p. 621)

Financial innovation has proven its significancy not only for the financial but also the global economy with the recent global crisis. However, this has also given a rise to a new discussion regarding the financial innovations. Having centralized innovations for economic development, Joseph A. Schumpeter has been recalled with an attempt to characterize financial innovations through his innovation theory. Focusing on financial innovations, this thesis mainly asks if it is possible to apply Schumpeterian notion of entrepreneurial innovation to the sphere of finance.

It is difficult to find the origins of financial innovation. Frame and White (2004) presents a comprehensive review of literature on the sources of financial innovation. Nevertheless, their study cites only two papers on the origins of financial innovations: Ben-Horim and Silber (1977) and Lerner (2002)[1]. However, there are also some studies, as mentioned below, that give an insight on the history of financial innovation.

[1] Rather than providing a general overview on the origins financial innovation, Lerner (2002) focuses on financial patents, which is a particular aspect of financial innovation. See also Lerner (2006) for a firm-specific analysis on the origins of financial innovation.

Pointing out the small literature on the history of financial innovation, Tufano (2003) suggests that its roots date back at least to four centuries ago. In the same vein, Merton (1990) mentions the evidence from the history shows that the options and contracts, which resemble futures today, were being largely transacted on Amsterdam stock exchange by the 17th century. In the same paper, Merton further asserts that even the concerns, which had been raised about those contracts in Amsterdam by that time, such as manipulation and excessive speculation, share similar characteristics to those of today. Knoll (2004) also searched about the ancient roots of modern financial innovation with a specific focus on the put-call parity technique and found that, contrary to common belief, it has roots from 2000 years ago in Medieval England and ancient Israel.[2] From a closer time perspective, Miller (1986) shows that the trade of options on commodity futures was taking place on the Chicago Board of Trade in the 1920s.

Regardless from the fact that financial innovation has being used over the past few centuries; it did not arouse a strong interest in neither economics nor finance literature until the recent decades. According to Miller (1986, p. 460), "They were lying like seeds beneath the snow, waiting for some change in the environment to bring them to life". Only starting with the second half of the 20th century, this disregard in the literature turned into a recognized significance due to an increase in both the popularity and rate of financial innovation in the financial markets (Marty, 1961; Tucker, 1976; Ben-Horim & Silber, 1977; Silber, 1975, 1983; Van Horne, 1985; Kane, 1983, 1986; Miller, 1986; Faulhaber & Baumol, 1988; Allen & Gale, 1988, 1994; Ross, 1989; Mishkin, 1991; Merton, 1990; King & Levine, 1993a; King & Levine, 1993b; Duffie & Rahi , 1995; Tufano,1989, 2003; Persons & Warther, 1997; White, 2000; Akhavein, Frame, & Lawrence, 2005; Lerner 2002, 2006; Frame & White, 2009; Allen, 2012). After the global crisis of 2008-09, this literature has gained an even greater momentum, especially with studies focusing on the new financial system in which financial innovation has not only gained a substantial role but also caused a structural change in the nature of financial

[2] Knoll suggests that while financial tools are first described as technique in 1969, it was used in ancient Israel and Medieval England before it was formally described.

markets (Barrell & Davis, 2008; Crotty, 2009; Park, Blach, 2011; Awrey, 2011; Allen, 2012; Engelen, Erturk, Froud, Leaver, & Williams, 2010; Sánchez, 2010; World Economic Forum, 2012).

In recent years, besides the increasing popularity of financial innovation, studies have also started addressing the risks and drawbacks that are associated with these financial tools. Until the global crisis, the conventional wisdom towards financial innovation was generally positive and the potential risks related to it was either unexplored or underestimated. Erupted the global crisis in 2008; this positive look over financial innovation has been strongly challenged as the burdensome outcome has called for its reconsideration from a different standpoint.

Yet, as demonstrated by Johnson and Kwak (2012) "the social value" of financial innovation is unclear. Hereof, the global crisis acted as a catalyst in questioning this unknown, or, hidden, aspect of financial innovation: it showed that financial innovation, in addition to its bright side, has also a dark side, which could affect the global economy in a hazardous manner. This is mainly due to its relation to the real sector and economic growth.[3]

In this respect, Johnson and Kwak (2012) argue that unlike the conventional wisdom, benefits of financial innovation do not exceed the costs and risks that it creates. Using a macro-economic policy approach to evaluate the impact of financial innovation, they mainly point out the fiscal policy issues and address the need for a criticism to be brought upon financial innovation. The authors assert that financial intermediation is the core function of the financial sector and financial innovation has the primary role of improving financial intermediation; however, the outcome is more likely to be destructive and excessive with financial innovation. The risks of unchecked financial innovation as Johnson and Kwak (2012) claim, also increases the risks attached to financial markets. On the contrary, Sánchez (2010) discusses that, apart from financial innovation, there are some other

[3] See Chou and Chin (2001), Mishra (2008), Michalopoulos, Laeven, and Levine (2009) on the relation between financial innovation and economic growth.

fundamental forces behind the global crisis and hence, it is not per se the financial innovation to be blamed on.

In the pre-crisis period, the benefits of financial innovations were largely praised as it mainly improved risk management and risk control. Risk sharing has constituted the primary incentive for financial innovation (Allen & Gale, 1994). Thereby, market participants extensively used financial innovation to share the risk they bear and improved their risk profiles. However, the global crisis proved that the consequences of this risk sharing ability of banks and market participants could, indeed, be hazardous for the overall economy. Blommestein (2012, p.3) refers to this situation as *risk paradox*: financial innovations resulting in potentially improved risk profiles of individual financial institutions and higher standards of living, on the one hand, with an increase in financial fragility and systemic risk, on the other. In his study, Blommestein argues that the global crisis has revealed the dark side of the risk paradox as it increased the financial fragility, contagion and systemic risk.

In this context, for instance, Mason (2008) distinguishes between two types of financial innovation as follows: the first is the *real financial innovation*, which provides economically valuable benefits and the second is *the nominal financial innovation*, which does not provide economic benefits in the long term. As it is obvious, there is not any compromise in the literature on whether financial innovation caused the crisis or not.[4] Hence, there is still an ongoing debate, especially regarding the tax and regulatory concerns towards financial innovation.

Frame and White (2009) defines financial innovation as something new that reduces costs and risks or provides an improved product/service/instrument that better satisfies financial system participants' demands. In a more generalized manner, for Pol (2009), financial innovations is any new idea applicable to the essential function of finance.

[4] For more information on the relationship between financial innovation and global crisis see Park (2009), Sánchez (2010), Henderson and Pearson (2011), Beck, Chen, Lin, and Song (2012).

By the time of Schumpeter, financial innovation existed as a fact of an ongoing process over the past few centuries; however, his innovation theory focuses largely on the innovations of the real sector. Nonetheless, the rising importance of financial innovation in the global economy has called for the elements of Schumpeterian theory with an aim to adapt it in the context of financial innovation.

For instance, Burlamaqui (2000) addresses Schumpeterian competitive approach in the context of financial innovation. He presents a “blending” approach - an evolutionary macrofinance perspective - by connecting Schumpeterian competition with Minsky’s financial fragility framework and extending it to the financial sphere through the competition for financial innovation. Burlamaqui argues that when financial innovations stem from competitive strategies implemented by the banking sector, a Schumpeterian competitive approach becomes highly suitable for financial fragility framework of Minsky. The author suggests that taking such a comprehensive “blending” approach enables Schumpeterian competition to establish a direct link between financial innovation and financial fragility as well as finance and development. It should also be noted that the creation of this approach has its source in the view that Schumpeter, albeit centralizing finance in his theory, only focused on the innovations of the real sector and hence, financial innovations remained out of his focus. This is also shared by Knell (2012), who related Schumpeter’s views mainly on money and credit with Minsky as claiming that Minsky adopted Schumpeter’s idea of the innovating entrepreneur to the idea of financial innovations that are produced by financial institutions. Knell mentions that Schumpeter set his focus on the innovations of only the real economy and left the financial innovations as a missing point. This is exactly where Minsky entered into picture as focusing on the innovations of financial sector.

According to Minsky (1990, p.52), “new combinations, which result from the outcomes of negotiations among entrepreneurial business men and financiers, lead to process and product innovations as well as new financing relations and new financial institutions.” In his study, Knell also points

out to the sharp contrast in between Schumpeter and Minsky since the former regarded innovation as the main source of stability whereas the latter regarded financial innovations as the main source of financial fragility and instability.

Festre and Nasica (2009) explains Schumpeter's view on money, banking and finance from an Institutionalist framework and places an emphasis on the significant role of banking system and its innovative characteristics in Schumpeter's theory. For Schumpeter, the process of transformation in monetary, banking and financial institutions is mainly important within economic development and the changes are all based upon an institutional background. The authors state that financial innovations could be seen as the many tools of adaptations to the tension existing between industrial and banking capital. In this sense, the authors suggest taking an Institutionalist approach when the aim is to analyze developments in banking and finance form a Schumpeterian perspective.

It is in *The Theory of Economic Development* (1912/1934) that Schumpeter explained the types of entrepreneurial innovation; yet, none of these types specifically addressed the innovations of the financial sphere. Furthermore, Schumpeter did not use the term 'financial innovation' in any of his well-known studies (1912/1934, 1939, 1942, 1954). However, the similarity between Schumpeter's entrepreneurial innovation and financial innovation enables making a reassessment on Schumpeter's innovation theory through adapting its context, process and characteristic into financial innovation.

In the recent literature, there is a new trend in which financial innovation is treated as it is an entrepreneurial innovation described and analyzed by Schumpeter. The role of financial innovations within a Schumpeterian business cycle as well as its process, whether it is also subject to creative destruction or not, is among the most researched areas within the studies. However, the case of entrepreneurship within financial innovation has not been explored in the literature, yet. In this respect, this thesis aims to contribute to the literature as exploring an important aspect of Schumpeterian

theory and ask if the theory of entrepreneurship innovation is useful to explain financial innovation.

Guided by the Schumpeter's theory of innovation, the evolutionary characteristic of the financial institutions and banking as well as the interdependence between the real and financial sectors, this thesis introduces a new approach in order to Show that financial innovation can be analyzed within the context of Schumpeterian entrepreneurial innovation.

The thesis plan is as follows. Chapter 2 examines Schumpeter's entrepreneurial innovation by analyzing it's role during the process of creative destruction and business cyle. It aims to highlight the fact that as Schumpeter's theory focuses on the innovations of the real sector, the innovations of the financial sector are unexplored within these processes. Arising from this, Chapter 3 provides an overview on the character of financial innovation and searches for the traces of financial innovation in Schumpeter's theory. It questions if the financial innovations have a role in the innovational processes decribed by Schumpeter: Do financial innovations lead into creative destruction? Chapter 4 argues that the interdependence between the real and financial sector makes it very difficult to isolate financial innovation from the Schumpeterian economic system. It demonstrates the great similarity between entrepreneurial and financial innovations through a comparative analysis. Furthermore, while searching for the performer of the financial innovation, this chapter proposes a new argument by suggesting that the Schumpeter's rationalization process becomes a "backwards" rationalization process in the case of financial innovation. This is a unique contribution as it enables making predictions for the future of capitalism. Chapter 5 concludes by suggesting some future research areas, which are thought to contribute to the development of the literature.

CHAPTER 2

THE INNOVATION

Innovation has become the key factor not only for the development and growth of the countries but also for the firms aiming to sustain their competitiveness and growth in the sector they are operating in. In this sense, the importance of innovation for an economy is grounded upon both micro and macro foundations. Furthermore, the scope of innovation has grown exponentially and today, it is possible to observe an innovative activity that has an impact in almost every aspect of life.

Schumpeter is the pioneering economist in analyzing the concept of innovation within the economic sphere and eventually, centralizing it not only for the development of economy but also for the functioning of the capitalist system.

In this chapter, first, the life of Schumpeter is explored in order to find the roots of his interest towards innovation. Then, an overview on Schumpeter's innovation theory is presented. This is deemed necessary to explain the role of innovation during the process of creative destruction. The changes brought by innovation gains also a cyclical characteristics during capitalism. This cyclicaliy leads into instability in the economy, which are referred as business cycles. In this respect, this chapter also points out to the relation between innovation and business cyles.

2.1. The Life of Schumpeter: Why Innovation?

Schumpeter was born on 8th of February 1883 in Třešť (formerly of Austro-Hungarian Empire, now in the Czech Republic) to German parents. His father was a local entrepreneur, who owned a textile factory. Unfortunately, he died when Schumpeter was at the age of four. That was a misfortune that Schumpeter could neither observed a real entrepreneur nor did he learned from him. After the premature dead of this father, the family moved to Vienna in 1893 as Schumpeter's mother married a retired aristocracy military general.

This second marriage had a direct consequence on Schumpeter's educational development since from that year to 1908; he attended the Theresianum, an exclusive elite school that only served for the sons of aristocracy. As Hanusch and Pyka (2007) explains, in Theresianum, Schumpeter acquired inter-alia knowledge of Greek, Latin, French, Italian and Spanish. He also read widely in literature and history. Schumpeter also had some knowledge about music and graphic arts while his knowledge of mathematics was only limited. Therefore, as he graduated from high school, Schumpeter had a diverse knowledge about many subjects, which also reflected on his academic studies through his intellectual development.

For Schumpeter, Vienna is a city that is not only a home to his education and early academic career but also highly influential on his character. McFadyen (2008) suggests that it is from Vienna that Schumpeter acquired the agreeable, sometimes quaintly over polite old manner, which shaped his character together with his natural charm, friendliness, and vitality. Yet, the Viennese influence on Schumpeter does not solely address his character. Having witnessed the collapse of the Austria-Hungary Empire with the rise of the Austrian state in Vienna, it has no doubt an influence on Schumpeter's intellectual legacy.

Schumpeter studied law at the University of Vienna and took a doctoral degree from this university in 1906. There, Schumpeter was a student of Eugen von Böhm-Bawerk, who is one of the leading representatives of

Austrian school of economics.[5] In *Ten Great Economists: From Marx to Keynes*, Schumpeter referred to Böhm-Bawerk as follows,

> He was not only one of the most brilliant figures in the scientific life of his time, but also an example of that rarest of statesmen, a great minister of finance. … As a public servant, he stood up to the most difficult and thankless task of politics, the task of defending sound financial principles. (1951, p.145)

Eugen von Böhm-Bawerk has influenced Schumpeter in his early academic career and this can be asserted on the basis of his first publications that appeared in 1905 during his doctoral education.[6]

Concerning the influences on Schumpeter, Fagerberg (2009) suggests that Schumpeter's theorizing was inspired by three main approaches that he encountered during his studying in Vienna. Those inspirations are explained to be: (i) Marxism as he adopted the dynamic outlook; (ii) (German) historical school in economics as he put an emphasis on historical specificity; and (iii) the (emerging) neoclassical strand as he demonstrated the need for a micro-based approach, in which evolution is explained through the interaction of individual actors, rather than at the nation level, for instance.

Among various sources of influence on Schumpeter, the German Historical School (GHS) has presumably been the most researched and addressed source. For instance, Michaelides and Milios (2009) focus on the heavy influence of the German Historical School (GHS) on Schumpeter's later

[5] The Austrian school of economics is a school of economic thought that was founded in 1871 with the publication of Carl Menger's *Principles of Economics*. Basically, it supports the libertian philosophy and focuses on price mechanism as well as the concept of opportunity cost.

[6] Schumpeter's first publications were published in *Statistische Monatsschrift* in 1905. A brief biography, which mentions the influence of Böhm-Bawerk on Schumpeter's first publications, is available at http://www.caslon.com.au/biographies/schumpeter.htm

works. They specifically concentrated on the writings of Schmoller, Max Weber and Sombart and argued that Schumpeter formulated some his principal theses, such as the driving forces of the capitalist enterprise, the 'circular flow' and the 'spirit of capitalism', in accordance with the conceptual framework of GHS. Basılgan (2010) also explored the significant influence of the GHS on mainly Schumpeter's methodology of history and economic sociology. He suggested that as the representative members of the GHS proposed the ideas on the origins of entrepreneurship in capitalist societies and its impact on social and economic change, the GHS had a significant influence on Schumpeter's early ideological development.

Furthermore, praising Leon Walras (1834-1910) as the greatest of all economists in his *History of Economic Analysis* (Schumpeter (1954, p.827), Schumpeter no doubt was a great admirer of him.[7] However, Walras-Schumpeter relation is a highly complex one and there is also a disagreement concerning the influence of Walras on Schumpeter's mainly evolutionary thinking.[8]

After receiving his doctoral degree in law from the University of Vienna, Schumpeter spent few years in England and Egypt mainly for some educational purposes. His first major work, *Das Wesen und der Hauptinhalt der theoretischen Nationaloekonomie (The Nature and Essence of Economic Theory* [2010]), which is concerned with theoretical economics and its methodological foundations, appeared in 1908 during his stay in Egypt. In a Walrasian framework, Schumpeter mainly aimed to convince the members of the GHS about the usefulness of the theoretical approach with this book (Michaelides & Milios, 2009, p.511).

[7] Leon Walras is a French economist, who developed the idea of marginal utility and hence, became one of the founders of the "marginal revolution". His biggest contribution has been on the 'general equilibrium' theory as well as on developing the mathematical economics.

[8] See Andersen E. S. (1992) and Michaelides and Milios (2009) for some examples in this respect.

In year 1909, Schumpeter returned to Austria, where he became a professor of economics at the University of Chernovtsy. Later in 1911, he joined the University of Graz, where he held a professorship chair in Political Economy until the end of World War I in 1918. He also served as a visitor professor at Columbia University as awarded an honorary degree in 1913.

Throughout his period in University of Graz, Schumpeter's international preeminence in economic theory had been acknowledged based upon some of his major works. Most significantly, his first classic work *Theorie der wirtschaftlichen Entwicklung* (1912/1934) was published at the end of his first year in the University of Graz. This work is regarded to be a classic in the sense that Schumpeter clearly presents the economic origins of business cycles as he explains how entrepreneurial actions shape the capitalist economy through economic development early in this particular work. As Courvisanos (2012) emphasizes, it is with this book that Schumpeter re-introduced the entrepreneur into economic analysis after it faded from the economic scene due to dominancy of the static equilibrium neoclassical model in the second half of the 19th Century. In this sense, as conceptualizing the entrepreneur as the driving force for economic development, the influence of the Austrian School on Schumpeter is also apparent in this classic work.

Schumpeter's *The Theory of Economic Development* (1912/1934) is also an important piece when considered in a different regard and the reasoning is as follows: Industrial patterns that are described by Schumpeter are basically divided into two, which are often referred as Schumpeter Mark I and Mark II. In his early writings forming Schumpeter Mark I, he developed an original approach in which focuses on small firms operating in highly competitive industries as well as the visionary entrepreneurs as the major source of innovation, whereas in Schumpeter Mark II, the large firms that are operating in oligopolistic industries play this role (Keklik, 2003). [9] In this framework, *The*

[9] In his empirical study, Keklik (2003) also pointed out to the fact that both Schumpeterian patterns of innovation, Schumpeter Mark 1 and Mark 2, can coexist in the economy in different industries at any point of time.

Theory of Economic Development (1912/1934), clearly represents what is described as Schumpeter Mark I. It is also in this work that Schumpeter explained the crucial role of both the entrepreneur and the banker via credit mechanism for the innovative activity's taking place in an economy.

An early work of Schumpeter *Epochen der Dogmen- and Methodengeschicht* (1914) *(Economic doctrine and method* [1954]) also appeared during his time in University of Graz. This work is regarded as Schumpeter's most important contribution to the history of social science as it concentrated on demonstrating that the battle of methods had been resolved (Andersen, 2011).

Schumpeter's life was not constrained with holding academic positions. After his resign from University of Graz, we see another identity of Schumpeter in which he is entitled with different positions in both government and business at high levels. For a short length of time in 1919, Schumpeter served as Finance Minister of Austria. However, as the economic and financial conditions were already devastating due to World War I during that time, he could not prove to be a successful minister and he was forced to resign even before he was given any possibility to implement an economic policy, especially to fight against inflation (Demir, 1995, p.158). Later, between the years 1920 and 1924, Schumpeter served as the president of the private Biedermann Bank. Unfortunately, mainly resulting from the economic crisis of 1924 that both hit Austria and Schumpeter's personal financial accounts sharply, not only he left Biedermann Bank, but also the Bank closed its door by 1927 due to its inability to meet its obligations. Furthermore, during his time in Biedermann Banks, as parallel with his economic thoughts, he granted privileges for giving high amounts of investment credits to individual investors (Demir, 1995).

Besides mentioned positions above, Schumpeter also had some personal experiences in the business scene. Before developing an entrepreneurship theory, Schumpeter long had an interest towards enterprises related to different industries. One should not be surprised with the fact that his father

was also an entrepreneur. Throughout his life, he put his mentioned interest into practice for several times; unfortunately, none proved to be a true success story. Allen (1991) laid out some examples in this respect. For instance, Schumpeter became a member of the board of the Upper Austrian Porcelain Enterprise in February 1922. He also invested in some other enterprises in order to make quick profits and made a deal with a German chemical company with the purpose of founding an enterprise in Austria of which he was to be its president. Allen (1991) suggested the underlying reasons behind Schumpeter's aim of making money to be as follows,

> He wanted to make money for two reasons. Just as books and published papers in scientific journals measure the success of an academic economist, so the accumulation of wealth measures the success of a businessman. He believed he had already proved his success in economics. … Now, he wanted wealth to prove his mettle in business.
>
> But Schumpeter also needed money for another reason. Schumpeter had always cultivated expensive tastes. … In addition to wanting to live in prime real estate, he wanted to dress elegantly and enjoy good food, wine, and the nightlife of Vienna, usually in the company of young ladies. To maintain this lifestyle, he obviously needed money. (p.187)

Yet, Schumpeter's academic achievements afterwards should have proved his own feelings about his success by that time to be an early one. This is due to the fact that he became a much more successful economist, who is especially being reappraised and known with his later works.

In 1925, Schumpeter gave an end to the gap as he returned to his academic career at the University of Bonn, teaching economic theory. However, as he did not pursue his academic career in Germany, his position at the University of Bonn was only temporary. Giving lectures in Harvard University in 1927-1928 and 1930, and visiting The Tokyo College of Commerce in 1931, he moved to the United States in 1932 and he became a US citizen in 1939. In

the United States, Schumpeter lectured at Harvard University with holding a permanent position of professorship until his retirement in 1949. This obviously makes Harvard University the permanent tenure of Schumpeter besides its being the institution that most of his important, recognized and still debated works were affiliated with. Table 1 represents a brief life chronology of Schumpeter.

Table 1: A brief life chronology of Joseph A. Schumpeter

Year	Life event
1883	Born in Třešť, Austria-Hungary (2/8/1883)
1893	Moved to Vienna with his mother
1893-1901	Attended at the elite Theresianum Academy
1901	Entered Vienna University (law)
1905	First publications appeared
1906	Gained a Juris Doctor in law
1907	Moved to Egypt
1908	First book published (*Das Wesen und der Hauptinhalt der theoretischen Nationaloekonomie*)
1909-1911	Returned to Vienna and became a professor of economics at University of Chernovtsy
1911-1914	Joined University of Graz

Table 1: A brief life chronology of Joseph A. Schumpeter (continued)

1912	*Theorie der wirtschaftlichen Entwicklung* appeared. (Translated into English in 1934 as *The Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interest*)
1913	Visitor professor at Columbia University
1919	Became Austrian Minister of Finance
1920-1924	Became President of the private Biedermann Bank
1924	Left Biedermann Bank
1925-1932	Became a professor of economics in University of Bonn
1932	Moved to the United States and became a professor in Harvard University
1937-1941	Became the President of the Econometric Society (founding member)
1939	*Business Cycles: A Theoretical, Historical, and Statistical Analysis of the Capitalist Process* appeared
1942	*Capitalism, Socialism, and Democracy* appeared
1948	Became the President of the American Economic Association (first European president)
1950	Died in Connecticut, USA (8/01/1950)
1954	*History of Economic Analysis* appeared, posthumously in 1954, edited by his wife, Elizabeth Boody Schumpeter

The major two works that were published during this time in Harvard are the two volumes of *Business Cycles: A Theoretical, Historical and Statistical Analysis of the Capitalist Process (1939),* and his final and presumably the best-known work *Capitalism, Socialism, and Democracy (1942).*

To provide a complete list of his major works throughout his life, one more piece should be mentioned. *History of Economic Analysis (1954*), which was edited by his third wife, Elizabeth Moody Schumpeter, after his death in 1950, presents a monumental study in the area of history of economic thought. In this book, Schumpeter laid out a complete history of economic theory covering a period of more than 2000 years as starting from the ancient Greek. The importance of this last work also takes its source from Schumpeter's propounding the "Great Gap" thesis, which claimed that in history of economic thought, there is a gap of 500 years prior to the Latin Scholastics.[10]

As stated before, *The Theory of Economic Development* (1912/1934) is a classic in different respects but mainly because its' representing the industrial pattern that is called as Schumpeter Mark I. *Capitalism, Socialism, and Democracy* (1942) is another classic in various aspects. First, it is in this book that Schumpeter deals with the evolutionary characteristic of capitalism and supports his original view that the capitalist economic system is bound to disappear-not because of its failure, but because of its success. Second, Schumpeter introduced and described the process of 'creative destruction' in this book as follows,

> The opening up of new markets, foreign or domestic, and the organizational development from the craft shop to such concerns as U.S. Steel illustrate the same process of industrial mutation— if I may use that biological term— that incessantly revolutionizes the economic structure from within, incessantly destroying the old one, incessantly creating a

[10] The "Great Gap" thesis has been exposed to various debates and refutes concerning the role of Medieval Islamic Economic thought, which is largely being ignored by the literature on the history of economic thought. See (Ghazanfar, 1995) for further explanation on this.

> new one. This process of Creative Destruction is the essential fact about capitalism. (1942, p.83)

Last but not least, *Capitalism, Socialism, and Democracy* introduces an industrial pattern opposed to Mark I and hence, referred as Mark II. In Mark II, large and established firms generate innovations, i.e. creative accumulation. Thus, rather than newly establishing firms and individual entrepreneurs as in the case of Mark I, what is praised in *Capitalism, Socialism and Democracy* are the large established firms as the engines of economic growth. Furthermore, contrary to Mark I, in which the appropriability and cumulativeness conditions are low and the knowledge is mainly (firm) specific, codified and simple; in Mark II, the appropriability and cumulativeness conditions are high, while knowledge is mainly generic, tacit and complex (Soete and Weel, 1999).

The other work that came out during his fruitful Harvard years was, as mentioned, *Business Cycle: A Theoretical, Historical, and Statistical Analysis of the Capitalist Process (1939).* In this two volume monumental treatise, Schumpeter developed a theory that centralized the industrial innovations as the main promoter of business cycles. However, this work did not make a tremendous impression in especially the academia. McCraw (2007) even went forward claiming that *Business Cycles* was Schumpeter's least successful book and it is a noble failure that paid unexpected dividends both to the author and to scholarship. Nevertheless, its contribution to the economic theory cannot be entirely ignored. It is an important work in different respects. Having explained the concept of innovation in *The Theory of Economic Development* (1912/1934), it is also in *Business Cycles* that Schumpeter sets out an historical explanation of how those innovations lead into the formation of business cycles and how they proceed along the waves. It also shows the essentiality of an historical analysis in understanding the nature of modern capitalism as well as it introduces and describes the three waves of business cycles, which are referred in the honor of the economics who discovered them: Kitchin, Juglar and Kondratieff.

2.2. The Roots: Innovation in Schumpeter's Theory

Schumpeter (1928) described innovation as follows,

> It first – and by its initiative – expands its own production, thereby creates an expansion of demand for its own and, contingent thereon, other products, and the general expansion of the environment we observe – increase of population included- is the result of it, as may be visualized by taking any one of the outstanding instances of the process, such as the rise of railway transportation. The way by which every one of these changes is brought about lends itself easily to general statement: it is by means of new combinations of existing factors of new commodities, or by a new, i.e. as yet untried, method, or few a new market, or by buying means of production in a new market. What we, unscientifically, call economic progress means essentially putting productive resources to uses hitherto untried in practice, and withdrawing them from the uses they have served so far. This is what we call "innovation". (p.377)

Schumpeter developed an original approach by the early 20th century as centralizing innovation for the economic and social change. For Schumpeter, innovation was the key activity for reaching economic development. In that sense, he made a significant contribution as having brought a new perspective on the dynamics of economic activity.

Although by that time, with *Capitalism, Socialism, and Democracy (1942),* Schumpeter was overshadowed by the *General Theory of Employment, Interest and Money (1936)* of John Maynard Keynes; today, Diamond (2009) showed that for social scientists, since the mid-1990s, annual citations to *Capitalism, Socialism, and Democracy* have exceed annual citations to Keynes's *General Theory*. [11] Schumpeter is regarded as the father of

[11] Regarding their popularity throughout the 20th century and today, *Capitalism, Socialism, and Democracy* (1942) of Schumpeter and *General Theory* of Keynes (1936) has widely been compared. When *General Theory*of Keynes was published in 1936, due mainly to the economic conditions of that time, it received both a great attention and acceptance. Hence, when *Capitalism, Socialism, and Democracy* published 3 years later, Keynes overshadowed

evolutionary economics and the idea that technical change is the key to understand capitalism. Technical change is the engine of economic growth (Blaug, 2005, p.69). This rising popularity of Schumpeter can be interpreted through the rising importance of innovation for the world economies as being the engine of economic growth and development**.**

2.3. From Circular Flow to Innovation

In *The Theory of Economic Development* (1912/1934), Schumpeter starts in his first chapter with a description of the "circular flow", in which the change is absent from the economic system. In circular flow, the same products are produced in the same way every year and 'money has, in circular flow, no other role than of facilitating the circulation of commodities' (Schumpeter 1912/1934, p. 53). For Schumpeter, the circular flow represents the case of a stationary equilibrium, in which there are no profits, no savings, no interest rates and no involuntary unemployment in the economic system.

As Schumpeter (Schumpeter 1912/1934) described the circular flow as in the following,

> It follows, again from the fact that all goods finds a market, that the circular flow of economic life is closed, in other words that the sellers of all commodities appear again as buyers in sufficient measure to acquire those goods which will maintain their consumption and their productive equipment in the next economic period at the level so far attained, and vice versa. (p.8)

Then, Schumpeter introduced an innovator, entrepreneur, who brings change to this economic system by breaking up the circular flow. This change is brought to the system by way of innovation, which Schumpeter (1939, p.80) simply referred as any "doing things differently" in the realm of economic life.

Schumpeter and thus, *Capitalism, Socialism, and Democracy*received less attention than it actually deserved. See Diamond (2009) for a detailed analysis in this respect.

At this juncture, it should also be mentioned that Schumpeter makes a clear distinction between *invention* and *innovation*. As Schumpeter (1939, p. 80) puts it “Innovation is possible without anything we should identify as invention and invention does not necessarily induce innovation, but produces of itself no economically relevant effect at all”.The entrepreneur does not have a scientific concern whereas the main concern of an inventor is scientific and intellectual. The economic concern is only of the entrepreneur whereas the scientific and technologic concern belongs to the inventor. Thus, the keyword for the entrepreneur is innovation, which simply gives invention a practical application and a tradable meaning, i.e. innovation is the commercialization of the invention.

Innovation either introduces or combines a new production function, new sources of supply, new markets and new forms of organization. Then it diffuses the society requiring the destruction of the existing structure in order to replace itself, what Schumpeter called this process as “creative destruction”. It is simply this process that revolutionizes the economic structure.

2.4. The Relation between Innovation and Business Cycles: The Cyclical Instability

According to Schumpeter (1939), ‘Economic Evolution’ is the designed term for the changes in the economic process brought about by innovation, together with all their effects, and the response to them by the economic system. The effect of innovations in the society is widespread since not only those changes are economic but also social and technical. Those changes, which are triggered by a successful innovation, have gained a cyclical characteristic throughout the economic evolution. Arising from this cyclicality, Schumpeter formed a model for business cycles in the capitalist system. His model consists of three main cycles, given the names of the business-cycle theorists that designated them; Joseph Kitchin (1861-1932), Clement Juglar (1819-1905) and Nikolai Kondratieff (1892-1938).

Kitchin cycle with four and Juglar with nine years, Kondratieff cycle has the longest phase, ranging from fifty to sixty years. Kitchin cycle is related to fluctuations in inventories and consumption while Juglar cycle is related to fluctuations in fixed investment (Legrand & Hagemann, 2007). Kondratieff cycle is related to long period of fluctuations in price levels, production and consumption as a consequence of a significant innovation, which produces remarkable change in the economic system of the society. Those changes might alter the methods of production as well as it might alter the type of an organization. Since the innovations are central to the longest cycle, Kondratieff, it is necessary to examine it closely.

Kondratieff cycles are suggested to consist of four distinct phases of economic fluctuations. The first one is the *inflationary growth (spring)* phase, which starts with the introduction of a new, successful, innovation. After the introduction a specific innovation, similar innovations start to appear as following the former. In the course of time, an innovation cluster stars to develop. This brings along a growth in the economy with the rise in both productivity and inflation. Most importantly, this spring phase results in a new social, political and economic order as the new innovation causes upheavals and social shifts in the society. Lasting approximately for twenty-five years, the spring phase is followed by the *stagflation (summer)* phase. In the summer phase, the economy reaches its growth limits and then, it peaks. In order to alert the economy to danger, a short recession lasting from three to five yours occurs in this phase. After this short recession period, the third phase takes place and it is called *deflationary growth (autumn*). In *autumn*, the economy grows in a relatively stable way. Lasting from seven to ten years, it is in this phase that selective industry growth is experienced as well as development of new social and technological ideas. The last phase of the K-wave is called *depression (winter)*. Along the winter phase, businesses go into severe depressions and thereby, the economy contracts sharply. Unemployment rises further together with an impairing deflation. Therefore, this phase is considered to be a depression. Nevertheless, as it forms the last phase of a business cycle, it also paves a way to another K- wave.

Arising from this, winter phase is supported by the shifts in innovation and technology.

In this chapter, first, it is shown that Schumpeter's works and his life, in which there are times he is also seen as in the character of an entrepreneur, clearly reflect the significance that he has attached to the notion of innovation. For him, innovation stands at the center of capitalism as a promoter of economic development and thus, the functioning of the capitalist system. Then, this chapter provided an overview on the creative destruction and business cycles caused by innovational process in the economy. Creative destruction is the necessary process for the capitalist system to maintain its continuity. Once a successful innovation appears, it manifests itself in two different directions along the business cycle. Leading into growth and prosperity in the economy on one hand, it disrupts the existing means of production on the other. This creation and destruction pattern at the same time leads into business-cycle and the instability of capitalism arises right from this point.

Furthermore, this chapter argued that in Schumpeter's analysis, types of the triggering innovations along the business cycle and the process of creative destruction do belong to the real sector. Arising from this point, it is claimed that the innovations of the financial sector are unexamined within these processes in Schumpeter's theory. In this respect, the following chapter focuses on questions such as if financial innovations have a role in these processes? Do financial innovations are also subject to a process of creative destruction?

CHAPTER 3

THE FINANCIAL INNOVATION

Tufano (2003) broadly defines financial innovation as the act of creating and then popularizing new financial instruments as well as financial technologies, institutions and markets. While it is possible to find other alternatives to the definition that Tufano introduced, there is not any important division among them. This notwithstanding, the case for the taxonomy of financial innovation is different, i.e. it is not possible to find an agreed, or unique, taxonomy for financial innovation that is adopted in the literature.

As Tufano (2003) discussed, creating taxonomy is among the main problems that is faced when dealing with financial innovation. The challenge of categorizing new products is also demonstrated by various lists of financial innovation, which proved to have their own drawbacks. For instance, lists organized by product name tend to be uninformative while lists by “traditional labels” were mainly problematic. Organizing lists regarding the product feature provide a great deal of information as highlighting the component parts of each innovation; however, the broad dimension of such a classification system made it difficult to manage.

This chapter, first, provides a general introduction into the concept of financial innovation. Then, arising from the centrality of innovation in Schumpeter, it searches for whether he addresses financial innovation in his theory or not. Based on the relation between innovation and creative destruction, this chapter also explores the role of financial innovations during the process of creative destruction.

3.1. An Overview on Financial Innovation

An analysis of the literature shows that most studies chose to categorize financial innovations regarding the functions they serve. In this context, Marty (1961) distinguished two types of financial innovation. Those in the first type (a) function such as reducing the gap between lender's and borrower's rates and increasing the degree of perfection of the capital markets; while the functions of the second type (b) are such as reducing the amount of cash balances held and earn interest over the cash. Merton (1990) classified the functions of financial innovations into six as follows, (1) moving funds across time and space; (2) pooling of funds; (3) managing risks; (4) extracting information to support decision making; (5) addressing moral hazard and information asymmetry; and (6) facilitating sale and purchase of goods. In a similar approach, Finnerty (1992) suggested that financial innovations has three main functions and these are (i) reallocating risks; (ii) reducing agency costs; and (iii) increasing liquidity.

Dufey and Giddy (1981) made a classification based on the supply and demand factors, which are claimed stimulate financial innovation. According to this classification, financial innovations are mainly divided into two as being (*) "aggressive", which are developed by firms specializing in new financial product introduction; and (**) "defensive", which are existing tools but are modified when there is a change in customers' needs or in relative costs. Further, defensive innovations are also suggested to have two types, which are changes aimed at circumventing government regulations of the price and quantity of financial services; and adaptive changes resulting from changes in relative risks or prices.

The Bank for International Settlements (BIS) (1986) also pointed out to the problems of creating a unique taxonomy and suggested that a useful classification scheme for financial innovation should be based on the financial intermediation function performed. Taking this approach, BIS (*ibid.*) divided financial innovations into four: (b1) risk-transferring innovations, including both price and credit risks; (b2) liquidity-enhancing innovations; (b3)

credit-generating innovations; and (b4) equity-generating innovations.

Lastly, the taxonomy, which Tufano (2003) introduced, corresponds closely with the attempts of the previous studies explained. In this sense, it serves a combination of the key arguments, which has been raised in the literature. Tufano (*ibid.*) attributes six functions to financial innovations: (t1) completing incomplete markets; (t2) addressing inherent agency concerns and information asymmetries; (t3) minimizing transaction, search or marketingcosts; (t4) responding to changes in taxes and regulation; (t5) motivated by globalization and risk; and lastly (t6) stimulated by technological shocks.

The studies of Von Stein (1991) and Schrieder and Heidhues (1995) provides an alternative to the functional and demand and supply factor distinctions by classifying different types of financial innovation simply as (f1) financial system/institutional innovations, which refer to changes in the financial system as a whole as well as changes in the structure, organization or legal form of an institution; (f2) process innovations, which refer to introduction of new business processes and improvements in organizational and service distributions of a financial innovation; and (f3) product innovation, which refer to introduction of new or modified financial services.

Table 2 shows these suggested taxonomies in the recent literature on financial innovation. This table is also useful as indicating the type of factor, it represents that the categorization of financial innovations by functionalities is the most common approach.

Table 2: Taxonomies for financial innovation in the recent literature

Study	Taxonomy for Financial Innovation	Type of factor
Marty (1961)	(a) Reducing the gap between lender's and borrower's rate, increasing the degree of perfection of the capital market, reducing the lender's and borrower's risk premiums, etc. (b) Reducing the amount of cash balances held and earn interest on the cash	Functional
Dufey and Giddy (1981)	(*) Aggressive innovation (**) Defensive innovation	Demand and supply
Merton (1990)	(1) Moving funds across time and space (2) Pooling of funds (3) Managing risks (4) Extracting information to support decision making (5) Addressing moral hazard and information asymmetry (6) Facilitating sale and purchase of goods	Functional
BIS (1986)	(b1) Risk-transferring innovation (b2) Liquidity-enhancing innovation (b3) Credit-generating innovation (b4) Equity-generating innovation	Functional

Table 2: Taxonomies for financial innovation in the recent literature (continued)

Tufano (2003)	(t1) Completing incomplete markets (t2) Addressing inherent agency concerns and information asymmetries (t3) Minimizing transaction, search or marketing costs (t4) Responding to changes in taxes and regulation (t5) Motivated by globalization and risk (t6) Stimulated by technological shocks	Functional
Von Stein (1991) and Schrieder and Heidhues (1995)	(f1) Financial system/institutional innovations (f2) Process innovations, which refer to introduction of new business processes (f3) Product innovation	Functional/ Institutional

Besides the issue on taxonomy, what has mainly been discussed in the literature is the motive behind financial innovation. As shown in the Table 2 above, functionality approach acts as a guide in showing some of these motives such as transferring and managing risk and addressing information asymmetries behind making of a financial innovation.

Specifically, studies of Campbell (1988), Merton (1990) and Tufano (2003) cover a great majority of the driving forces behind financial innovation. Van Horne (1985) also summarized the most influential factors behind financial

innovation. According to him, there are six changes, which prompt financial innovation, and these include: (1) volatile inflation rates and interest rates; (2) regulatory changes and circumvention of regulations; (3) tax changes; (4) technological advances; (5) the level of economic activity; and (6) academic work on market efficiency and inefficiencies. Nevertheless, providing a more detailed literature analysis on the major forces behind financial innovation is necessary in order to represent the attitudes towards these forces as well as to show their trend of importance for financial innovation throughout the recent decades.

The link between financial innovation and taxes and/or regulation is widely discussed in the literature (Miller 1986, 1991; Smith, Smithson, & Wilford, 1989; Ramsay, 1993; Gergen & Schmitz, 1997; Calomiris, 2009). Many studies suggest it to be either one of the major impetuses or the major impetus (see Miller, 1991) for financial innovation. In this context, Kane (1986) applied dialectic thinking towards the nature of regulation and avoidance, which he regarded as the thesis and antithesis, and introduced a conceptual notion of "regulatory dialectic" in order to dramatize the process of financial and regulatory innovation. Simply put, Kane suggests that "regulatory dialectic" is the main reason behind financial innovation. Xuan and Shihong (2010) mention that with his study Kane is considered as the pioneer of circumvention theory since he argues that it is generally to circumvent government regulation and earn profit that promotes financial innovation. By same token, Kane suggests that the market innovation and regulation innovation should be regarded as the continuous fighting process between independent economic force and political force.[12]

The pioneering empirical study by Ben-Horim and Silber (1977) provides a formal test of constraint-induced model and hypothesized the structural conditions encouraging financial innovation. Their study found that regulatory constraints induce financial innovation. Finnerty (1988) also suggests that the

[12] Xuan and Shihong mentioned that there are four famous theories of the innovation motive and these are: (1) the constraint-induced financial innovation theory of W. L. Silber; (2) transaction cost innovation theory of Hicks and Niehans; (3) regulation innovation theory of Davies and Silla; and (4) circumvention theory of Kane.

frequency of tax and regulatory changes together with the increased volatility in interest rates constitute the main two factors in stimulating the process of financial innovation. The deregulation of the financial services industry fosters financial innovation through the ability of financial engineers to design and implement new financial products and processes. A financial environment where the interest rates are volatile also promotes the introduction of financial innovations such as interest rate swaps and options on interest rate futures in order to transfer the risk. For instance, the increased cost of investing in fixed-dividend-rate preferred stock as the interest rates become volatile has induced the introduction of variable forms of adjustable rate preferred stocks.

Analyzing from a historical perspective, Miller (1986) places a great emphasis on the tax and regulations and argues that, since the 1960s, the inefficient tax and regulatory structures have been the two major impulses to successful financial innovations. Miller asserts that most of the critical tax and regulatory structures such as interest rate ceilings, foreign exchange restrictions and anticompetitive controls were put in the 1930s and 40s. However, since the economic and financial conditions were already devastating due to war, those tax and regulations were not the most seriously binding constraints for people by that time. When a recovery in the world health and trade experienced by the middle and late 1960s, the tax and regulatory structures of the earlier decades took effect and increased the burden on the already existing constraints such as the volatility of prices and interest rates. This urged the need for a wave of financial innovations, which caused changes in financial institutions and instruments in an extent that Miller used “the world revolution” as an appropriate notion to describe those changes starting with the late 1960s.

Duffie and Rahi (1995) emphasized that in most of the cases, a new regulation, a change in fiscal or monetary policies of governments, or changes in accounting or tax codes, constitute the main incentive for financial innovation. In a policy analysis study, Gergen and Schmitz (1997) also examined that starting with the early 1980s, many of the securities innovation

has been tax-driven.

There are also some cases, when deregulation acts as an important stimulus for financial innovation. In this context, Van Horne (1985) notes that in the late 1970's and accelerated in the 1980's, financial services industry went through deregulation. In this period, lowered constraints such as reducing the boundaries between financial institutions resulted in some market participants' entering in new lines of business, which made it difficult for the existing institutions to remain their niche. Therefore, throughout such deregulation processes, financial innovation becomes increasingly necessary for survival of financial institutions.

During the early and mid-2000s taxes and regulation lost its popularity as an incentive behind financial innovation. This can be attributed to deregulation and lack of government supervision towards financial innovation in the previous decade, which, in turn, caused, according to Crotty (2009), Krishnamurthy (2009), Boz and Mendoza (2010), a severe global crisis in 2008 and called for regulatory reforms. Thereby, with the eruption of the crisis, studies started searching for the role of financial innovation in global crisis and a majority stressed the need for regulation in financial markets. As a consequence, regulation gained popularity and significance once again. The global crisis has raised the question of whether it is solely financial innovation that caused the crisis or it is the lack of global regulation policies?

While there is not an agreed answer to this, a majority of the studies claimed the former to hold true. In this respect, Sánchez (2010) argues that prudential regulation should be strengthened in order to discourage excessive risk taking and reduce the likelihood of major financial instability in the future. Awrey (2011) emphasizes the need to acknowledge the complexity of modern financial markets and the nature and pace of financial innovation. Only afterwards regulation can be formed in a way that it can be capable of responding to the inherent dynamism of modern financial markets and innovations. Analyzing from a different perspective, Allen (2012) claimes that it is not solely the financial innovation that is behind the recent financial crisis

and as the history shows, financial crisis has occurred with and without financial innovations. Rather then financial innovation, Allen points out to financial liberalization as being the main factor behind the global crisis.

Agency costs and information asymmetries set out another motive behind financial innovation. As Tufano (2003) noted in his review, the study by Ross (1989) is the often cited on the agency issues since it claimed institutional preferences to be the major reason behind the demand a new financial instrument or an innovation. According to Ross, institutional markets and financial marketing are the keys to understanding financial innovation. He argued that financial markets have become institutional markets, in which the most significant forces are financial market players, whose activities are governed by agency relations.

Boot and Marinč (2011) mentioned that some financial innovations, especially securities, help to overcome asymmetric information and agency problems.[13] However, their study argued that the imperfections existing in the financial reality lead to potential distortions, which surpass the benefits originated from financial innovation. Merton (1990) also referred to reductions in "agency" costs caused either by asymmetric information between trading parties or principles' incomplete monitoring of their agents' performance as being one of the systematic driving factors behind financial innovation.[14]From a recent historical perspective, Tufano (2003) places an emphasis on the information asymmetries as a motive. He claimed that innovations were responses to those information asymmetries and certain innovations forced the revelation of information while others exploited low cost information.

Globalization reinforces and dominates the evolution of financial innovation.

[13] Boot and Marinč (2011) referred to the security design literature in order to present some examples on this issue. For instance, Boot and Thakor (1993) suggested rationalizing debt as a valuable security in order to encourage information production in equity financial markets.

[14] Merton (1990) suggested two more systematic driving factors and they are: (1) demand for "completing the markets"; and (2) the lowering of transaction costs or increasing of liquidity.

As Tufano (2003) mentions, with greater globalization, firms, investors and governments are exposed to new risks, which are supposed to be managed by innovations. Innovations in finance have mainly lead to structural changes in capital markets, the effects of which can be regarded both as negative and positive. In this context, studies focus on different aspects of globalization such as its increasing uncertainty and volatility in the global financial environment (see Smith et al., 1989) as well as its providing a greater integration of international capital markets, greater international capital mobility and greater similarity between cost of funds in alternative capital market locations (see Levich, 1988). While the innovations in finance have led financial markets to become more complex and sophisticated, it raised another concern in the literature by giving a reappraisal of Schumpeter. The following section focuses on this issue.

3.2. The Financial Innovations in Schumpeter's Theory

McCraw (2007) regards Joseph A. Schumpeter (1883-1950) as the prophet of innovation. But, could Schumpeter be considered also as the pioneering economist of *financial* innovation? A new approach can be adopted through comprehensively analyzing Schumpeter's theory of innovation within the context of financial innovation today.

Schumpeter delineated the scope of "innovation" in *The Theory of Economic Development* (1912/1934) as follows,

> This concept covers the following five cases: (1) The introduction of a new good – that is one with which consumers are not yet familiar – or a new quality of a good. (2) The introduction of a new method of production, that is one not yet tested by experience in the branch of manufacture concerned, which need by no means be founded upon a discovery scientifically new, and can also exist in a new way of handling a commodity commercially. (3) The opening of a new market, that is a market into which the particular branch of manufacture of the country in question has not previously entered, whether or not this market has

> existed before. (4) The conquest of a new source of supply of raw materials or half-manufactured goods, again irrespective of whether this source already exists or whether it has first to be created. (5) The carrying out of the new organization of any industry, like the creation of a monopoly position (for example through trustification) or the breaking up of a monopoly position. (p.76)

As quoted above, the concentration that Schumpeter kept within the concept of innovation within his 5 types is largely on the real dynamics as there is not any specific emphasis concerning those innovations of financial sector. However, this lack of emphasis does not entirely prevent one from searching for the traces of financial innovation in Schumpeter's works.

Some studies (Burlamaqui, 2000; Knell, 2012) argue that Schumpeter never mentions and explains financial innovations in his works. Perez (2004) suggests that Schumpeter neglected the innovative side of the financier. Schumpeter did not use the phrase of "financial innovation" in any of his well-known studies (1912/1934, 1928, 1939, 1942, 1954). Even using an evolutionary approach in analyzing institutions, Schumpeter clearly lacks focus on financial innovation, which can be considered as the fruit of an evolutionary financial system. Yet, he did not explain the evolution of the financial institutions within the history in a detailed manner. For instance, in *History of Economic Analysis* (1954, p.147, 377, 520) Schumpeter mentioned an example of financial innovation, which is joint stock companies; however, he did not explained how it emerged and evolved through the economic history. To him, an example of a financial innovation only mattered when it played the role of serving better financing methods and/or opportunities for the purpose of innovation.

Studies such as Knell (2012), Burlamaqui (2000) and Tilburg (2009) all share the view that Schumpeter largely concentrated on the innovations of the real economy and neglected that of the financial sector. Burlamaqui (2000) and Perez (2004) stated that although in the Schumpeterian framework, finance

and financial institutions both have a strategic and a fundamental role, the financial world is not entrepreneurial.

According to Burlamaqui (2000):

> Although banks and finance were always at the center stage in his picture, neither product/process, nor organizational innovation in the financial sphere is treated analytically. Summing up, in Schumpeter's view, it appears that innovation had to be backed by finance, but finance itself was not usually served by innovation. (p.3)

Perez (2004) claims that for Schumpeter, contrary to the role of entrepreneur in a capitalist system, a banker is merely a 'bridge' that forms the link between the credit and entrepreneur. She emphasizes that Schumpeter concentrated his attention on the production entrepreneur and neglected the innovative side of the financier.

Although banking and financial institutions were always at the center of Schumpeter's economic system through their leading into economic development, Schumpeter, unlike his attitude towards entrepreneurial innovations, neither studied financial innovations in a detailed manner nor gave it a similar status to entrepreneurial innovations. Burlamaqui (2000) states that, although Schumpeter focuses on banks and finance, somewhat paradoxically, financial innovation did not act as a real discussion topic in his theory. In the same vein, Knell (2012) mentiones that while Schumpeter made some references to innovation in the banking and finance industries, he shows the instability of the capitalist system only as a consequence of the entrepreneurial activity of the real sector not the financial.

Some studies claim that Schumpeter does not mention financial innovations; however, what he explains in some parts of his work is actually itself a financial innovation but he does not categorize them separately. Schumpeter considers them as new practices that stimulate growth through

"technological" innovations. Among those studies, Raines and Leathers (2004) analyzed the role of financial innovations in the framework of Schumpeterian business cycle theory and proposed an opposing view to Alan Greenspan.[15] Greenspan claimed that taking roots from Schumpeter's creative destruction, financial innovations are the major contributors to the 'New Economy' by inducing a technology-led growth. However, according to Raines and Leathers (2004), the primary role of modern financial innovation has contributed to 'reckless' finance and speculative excess, which takes place in the secondary wave of the 'New Economy's' business cycle. Thus, the Schumpeterian approach towards business cycles support the Institutionalist and Post-Keynesian assessments on the role of modern financial innovations in the 'New Economy' and calls for 'rational' government intervention. This debate on the role of financial innovation does not thoroughly explain the nature of the financial innovation in Schumpeter's work. Heller (2012)'s remark is more illuminative on Schumpeter's interest for financial innovations: "Schumpeter had not heard of modern collateralized debt, securitization, and derivatives. But he understood the psychology of risk, speculation, "overdoing" things in an upswing with easy money, "loose banking methods", and "political encouragement"."

In Schumpeter's works, it is not possible to find a specific emphasis on the innovations of the financial sector as he kept his emphasis largely on the real dynamics and technological innovations that are being taken out in the real sector. However, that is not the same as claiming that Schumpeter completely ignored the innovations and "new practices" of the financial sector. Indeed, he mentioned the centrality of some financial innovations by that time for the innovation. Schumpeter argued that without the use of some specific financial innovations, such as joint stock company and limited liability, the most important technological innovations of the 19th and 20th century would have been impossible (Eichengreen, 2010). Obviously, Schumpeter was aware of the dynamism of the financial sector as well as its

[15] Alan Greenspan is an American economist, who served as Chairman of the Federal Reserve of the United States between the years 1987 and 2006.

evolutionary characteristics; however, for him, financial sector was only serving the road for reaching the final destination, which is economic development via technological innovation. Therefore, it can be suggested that he did not specifically focused on the financial innovation, as what mainly mattered for him was the innovations of the real dynamics.

3.3. Role of Finance and Financial Institutions in Schumpeter's Theory

Finance and financial institutions are important subjects in Schumpeter's theory as he considered money, credit, and finance to be essential for innovation process (Knell, 2012). Schumpeter has largely emphasized and explained the crucial role of finance and financial institution via centralizing them for the carrying out of innovations and hence, leading into creative destruction and economic development.

Schumpeter (1912/1934) also argued that a well-developed financial system enhances productivity by accelerating the speed of capital reallocation in the process of "creative destruction". In this respect, if we think of money and credit as the beating heart of capitalism, then, by the same token, we can suggest finance as the artery of that heart.

Schumpeter (1912/1934) made it clear that credit, or, being backed by finance, is a mandatory condition for those entrepreneurs willing to realize their innovation. The source for those entrepreneurs' finance comes from the creation of money and the form of credit given by the banks (Legrand & Hagemann, 2007). In that vein, in Schumpeter's theory, credit mechanism is clearly the main link between the real and financial sector of an economy. This link is highly crucial at the basis of economic development through the innovation activity. Schumpeter emphasized the essential role of money for the starting of new production process in order to reach a close integration between the monetary and 'real' aspects of the economic system (Messori, 2002).

Schumpeter simply suggested that credit is the sine qua non if there is an attempt to realize innovation. Given that only banks and other financial

institutions are capable of giving credit and providing the institutional setting for those who create an innovative idea, entrepreneurs stand at the center of Schumpeter's theory. In this regard, Schumpeter (1912/1934, p.110) called bankers as the "ephors of the exchange economy'' since they control and enable the transfer of credit and money to the innovative entrepreneurs. However, Schumpeter did not devote more missions to those bankers. In his vision, a banker or a financier is only a facilitator providing the needs of entrepreneur by way of giving credit. Hence, a banker does not have entrepreneurial motives such as those "hero of developments", i.e. Schumpeterian (or real) entrepreneurs.

It can be argued that financial innovation, which is related to banking activity, can also be seen as an entrepreneurial activity. Financial innovations popularize new financial instruments, financial technologies, institutions, and markets (Tufano, 2003). Schumpeter mainly addressed financial innovations through their effect on entrepreneurial innovations and hence, economic development. Yet, he never really called them as "innovations" as he preferred to call them as "new practices" that are taking place in the financial sector. Indeed, he assumed those new banking practices to be an "entrepreneurial activity" since it can create a "commercial and industrial enterprise".

Schumpeter (1947) indicated the role of financial institutions and practices as follows :

> Financial institutions and practices enter our circle of problems in three ways: they are "auxiliary and conditioning"; banking may be the object of entrepreneurial activity, that is to say, the introduction of new banking practices may constitute enterprise; and bankers (or other "financiers") may use the means at their command in order to embark upon commercial and industrial enterprise themselves (for example, John Law). (p.153)

The above quotation, even Schumpeter stated it in a footnote in one of his article, is very helpful in demonstrating how strong is the interdependence between the real and the banking and financial sectors, which, accordingly, makes it very difficult to isolate financial innovation completely from the real sector. In Schumpeter's world, the real sector and the banking sector and financial sector are strongly interrelated to each other via innovation that can only be realized through the credit mechanism as administered by financiers and banks.

Obviously, for Schumpeter, the use of new banking practices was directly related to the entrepreneurial activity. Besides its leading into further realization of entrepreneurial activities in the society, Schumpeter did not devote more explanation concerning the use and process of financial innovation. Schumpeter's *new banking practices*, what can be seen as the reflections of financial innovation today, only had the purpose of helping the real sector via its funding entrepreneurs in new and better ways. Arising from this point, one could ask about the origins of those practices or whether they have some specific purposes in the financial sector or not? However, these questions are left unexplored in Schumpeter's works. While finance is always at the center of Schumpeter's theory through its enabling entrepreneurial innovations to be performed via entrepreneurs, he did not analyze the innovative side of neither the finance nor the financier. To put it in a nutshell, Schumpeter did not extend his innovation to the financial sector.

3.4. Financial Innovation, Creative Destruction and Growth

Schumpeter (1942) proposed the notion of "creative destruction" and claimed it to be the essential fact about the innovative process that makes the capitalist system function. Through entrepreneurial innovations, Schumpeter described creative destruction as the replacement of the existing technologies, skills, ideas, and organizations with the newer or better, which, in turn, leads to economic development (1942, p. 83). While the innovations of the real sector are subject to creative destruction process that is extensively analyzed by Schumpeter, the analysis for the case of the

financial innovations is imcomplete. The question of whether financial innovations are subject to a creative destruction or not has not even been asked until the global crisis.

3.4.1. Destructive Creation: An Interpretation of 'Creative Destruction' Process for Financial İnnovation

There is a general attitude among the literature[16] about addressing the destruction that financial innovations cause to the global economy. Yet, this destructive side of financial innovation has only recently attracted attention with the global crisis[17].

With the eruption of the global crisis, there experienced an upheaval of studies on Schumpeterian perspective with mainly regarding the nature of financial innovation and finance. In the framework of Schumpeterian business cycle, Aydın and Takay (2012) searched for the destructive effects of financial innovation that brought into front with the global crisis. They emphasized that Schumpeter took a negative approach to the use of financial derivatives in financial speculation since according to Schumpeter "the path that leads from the financial sector to real investment is tortuous and unsafe" (Schumpeter, 1939, p. 885). Their study also succeeded to show the link between finance and the first and secondary waves of Schumpeterian business cycle: entrepreneurs prepare the first wave by introducing a new innovation and then this innovation spreads through the financial sector, causing the speculations begin and the bubbles to grow once the new age entrepreneurs of the financial sector comes into scene.

Eichengreen (2010) speculated about what Schumpeter would have thought about the global crisis and the nature and role of financial innovations in this context. He argued that Schumpeter emphasized the role of finance in

[16] See Johnson and Kwak (2012), Ülgen (2012)

[17] See Aydın and Takay (2012), Beck et al. (2012), Sánchez (2010), Park (2009)

capitalist dynamics and the importance of financial innovations, such as joint stock company and limited ability, in the realization of the most important technological and commercial innovations during the 19th and 20th centuries. However, this study also addressed the fact that today, the use and nature of financial innovations has altered. Rather than an efficient risk diversifying, the main purpose of financial innovations have become shifting risk to naïve investors who lack of information and the investors who were confident about a “bail-out” if things go wrong, and giving banks instruments that would allow them to make profits out of these investors. Therefore, the study concluded that Schumpeter, as an economists aware of the dynamics that are intrinsic to the operation of the capitalist system, would have emphasized the role of ideology in shaping regulation and support an economics better informed about the actual historical events rather than an economics based on sophisticated mathematical models, which lack of ideological biases.

Ülgen (2012) developed a specific Schumpeterian analysis of the evolution of the capitalist economy in order to show the destructive effects and structural changes that financial innovation causes by creating a sort of secondary wave of business cycle. He claimed that financial innovation couldn’t be assumed as a Schumpeterian entrepreneurial innovation because rather than creative destruction, financial innovation often provokes a destructive creation path and does not lead into economic development. According to Ülgen, the recent global crisis has demonstrated that financial innovation and competition lead into financial instability in a liberalized economy. Therefore, he suggested that the Schumpeterian intellectual legacy should be developed and applied to the modern financial system to make financial innovations able to stimulate economic growth and development under the control of government regulation.

Bhagwati (2008); Tett (2009); Wolfe, Davis, Hepburn, Mills, and Moore (2011) and Soete (2011) also argue that innovations in finance are subject to a process of destructive creation. Unlike the entrepreneurial innovations that generate positive outcomes on economic development, financial innovations lead to reckless finance and this makes creative destruction a destructive

creation process for the economy. By the same token, Raines and Leathers (2004) argue that modern financial innovations, especially financial derivatives, contribute to 'reckless finance' and speculative excesses in the second phase of a Schumpeterian business cycle in deregulated financial markets and institutions. Arising from this fact, while the authors did not mention Ülgen (2012)'s term 'destructive creation', they explicitly opposed A. Greenspan (2002)'s claim of modern financial innovations' contribution to creative destruction. Bhagwati (2008) also stated that unlike entrepreneurial innovation, financial innovation results in more upheaval with lethal downsides, which is called 'destructive creation' in such cases.

3.4.2. Financial Innovation and Growth

The centrality of finance in Schumpeter's theory has guided numerous studies, which are mainly searching for the link between financial services and economic development and/or growth. A great majority of those studies adopted a Schumpeterian endogenous growth model (Aghion & Howitt, 1992; Phillips & Wrase, 1999; Howitt, 2000; Alcouffe & Kuhn, 2004; Dosi, Fagiolo, & Roventini, 2010; Plehn-Dujowich & Li, 2010; Acemoglu & Cao, 2011).

In an empirical study, King and Levine (1993a) examined the significance of financial development for economic growth, which is a consisted view with that of Schumpeter. Their study found that the indicators of the level of financial development are strongly and robustly correlated with the indicators of the level of economic growth. Therefore, their study proved that by increasing the rate of capital accumulation and improving the efficiency with which economies use that capital, financial services stimulate economic growth. As Schumpeter centralized finance in his theory, the authors concluded that Schumpeter might have been right about the link between in between financial development and economic growth.

In another empirical study, King and Levine (1993b) followed a Schumpeterian approach by constructing an endogenous model in which the

financial system affect the entrepreneurial activities that lead to productivity improvements in four ways: (1) evaluating prospective entrepreneurs; (2) mobilizing resources to finance promising activities; (3) diversifying the associated risk with these innovative activities; and (4) revealing the potential rewards to engaging in innovation. Their study found that a better financial system leads to more successful innovation activities by accelerating the rate of productivity enhancement. Hence, they concluded that more-developed financial systems have a positive impact on economic growth.

Searching for the relation between financial innovations and economic growth has also been an interesting subject that is focused by various studies, especially starting with the 21st century, where financial innovations have gained popularity.

According to Chou (2007),

> Financial innovation raises the efficiency of financial intermediation by increasing the variety of financial products and services, resulting in improved matching of the needs of individual savers with those of firms raising funds for expanding future products. The resulting capital accumulation leads to economic growth. (p.78)

The process of creative destruction is also an integral part of economic growth. It leads into higher levels of economic growth mainly through the channel of technological advances. In this respect, technology also acts a bridge in between financial innovation and economic growth. Michalopoulos et al. (2009) addressed the issue of financial innovation in order to examine its role in economic growth in line with the Schumpeterian endogenous growth model, in which technological and financial innovations reflect the decisions of profit maximizing agents. Linking the financial and technological innovations, they found a positive correlation and suggested that financial and technological entrepreneurs interact to shape economic growth. Pointing to the vital role of financial innovation in stimulating economic growth, they

emphasized that technological innovation and economic growth will eventually stop unless financiers innovate.

In the late 1980s, many advantages have been obviously experienced both in the financial and real sectors, thanks to the interaction between technology and financial innovation. In various cases, financial innovation has proven to be cost-efficient and timesaving, as it addressed the agency problems and incomplete markets, as well increased globalization and risk sharing (World Economic Forum, 2012). Most financial innovations such as ATM, EFT, online banking, currency and interest rate swaps have clearly benefited individuals in many ways and replaced some old banking and financing methods with the newer and/or better.

The most significant impact of financial innovation on the overall economy has been its promoting growth (Andersen, 2011). In this regard, King and Levine (1993a) examined Schumpeter's view on the nexus between financial development and economic growth[18]. They show that Schumpeter might have been right about the significance of finance for economic growth since financial development is strongly associated with economic growth through the channel of capital accumulation and economic efficiency. Furthermore, leading to the creation of new securities, financial innovations enable the investor to invest in various types of securities. As a result, while the investors earn interest, financial institutions promote economic growth by investing the capital they acquire (Kimmel, Weygandt, & Kieso, 2010).

According to Mishra (2008, p. 1), "financial innovations in the form of new financial instruments, services, institutions, technologies, and markets mobilize financial surpluses from ultimate savers and channelizes them into most productive investment avenues thereby raising the rate of capital accumulation, and hence, the rate of economic growth." In the context of an

[18] See Kuznets (1955), Goldsmith (1969), Mckinnon (1973), Shaw (1973), Finnerty (1988), Lucas (1988), Roubini and Sala-i-Martin (1992), King and Levine (1993a), Rajan and Zingales (1988), Khan and Semlali (2000), Chin and Chou (2001); Chou (2007), Cecchetti and Kharroubi (2012) on the relation between the financial development and economic growth.

endogenous growth model, Chou and Chin (2001) also investigated how and through which channels the increasing variety of financial products, as well as the increasing sophistication of financial markets, leads to economic growth. They identified two channels: (i) capital accumulation, through which financial intermediaries transform household savings into productive investments by firms; and (ii) venture capitalists, which fund risky technological projects with high potential payoffs. Their study also found that financial innovation ultimately leads to long-run growth through technological innovations, i.e. through its venture capitalists role; whereas the transformative role of the financial sector only leads to temporary growth.

Arising from the relation between financial innovation and economic growth, and thus, creative destruction, there is a place for financial innovation in Schumpeter's theory. Therefore, it is possible to attribute a role to financial innovations during the process of creative destruction.

In this chapter, first, the suggested taxonomies as well as the major motives that give a prompt for financial innovation are introduced. While there are a lot of taxonomies that are suggested in the literature, it is shown that the usual approach is to categorize financial innovations as product, process and institutional innovations. Then, it is searched if financial innovations have a role in Schumpeter's theory. Through this search, it is pointed out that while Schumpeter was aware of the dynamism of the financial sector as well as its evolutionary characteristics; for him, financial sector was only providing the necessary means in order for the innovation activity to become realized by the entrepreneurs.

Furthermore, in this chapter, creative destruction process and Schumpeterian business cycle are analyzed in the context of financial innovations. It is shown that the general opinion in the literature is to assume the process of creative destruction to turn into a destructive creation process for the case of financial innovations. It is explained that this mainly arises through the damage that financial innovations have caused in the gloabl economy with the global crisis. However, this thesis argued that it is possible to attribute a

role to financial innovations during the process of creative destruction due to the mutual relation between financial innovations and economic growth.

CHAPTER 4

THE INTERDEPENDENCE BETWEEN THE REAL AND FINANCIAL SECTORS

The relation between the financial sector and the technological advances has been highly crucial for the development of both the financial and the real sectors. While technological innovations are central for financial innovations, the relation in between is not one-sided; the developments and innovations of finance have also an impact on technology. Especially the developments in the technology has important contribution on the evolution of the financial markets in recent decades. As Das (2006) points out, liberalized domestic economic strategies, advances in Information Technologies (IT) and globalizing economies all stimulate financial innovation.

As the financial innovations have benefited in a high degree, especially in technical aspect, from the advances in technology, the nature of financial system has also gone through some structural changes. Most importantly, due primarily to technological advances, financial markets have become more complex. Researchers interpret this complexity in two different ways. For instance, while Gilchrist and Zakrajsek (2008) claim that recently, financial and real sectors have become more integrated and interdependent; Schinckus (2008) claims that as a result of the technological evolution of finance, financial markets can now be considered as a “hyper-market”, where the immateriality of finance has increased. In this chapter, it is shown that the real and financial sectors and thereby, the financial innovations as being the tools of the financial sector, are strongly related to each other via technology.

Due to the advances in technology, the financial sector has gone through such an evoluation that the financial innovations have become even more similar to the Schumpeter's entrepreneurial innovation than before. After comparing entrepreneurial innovations and financial innovations, this chapter asks a question which has not been explored before: who is the performer of financial innovation? Furthemore, this chapter proposes a new interpretation regarding Schumpeter's rationalization process and suggests that this process becomes a "backwards" rationalization process for the case of financial innovation.

4.1. The Relation between Technology and Financial Innovation

The increasing importance of technology as a prompting factor for financial innovation has been on the agenda especially starting with the 1980s; however, the root for the relation between technology and financial development goes back to earlier decades. For instance, Fernandes (2005) suggested that in *Theory of Economic History* (1969), John Hicks argues that the development of financial markets in England was a pivotal condition for the industrialization process that started in 18th century England. The study by Fernandes (2005) provides a historical survey on the relation between technology and financial innovation.

Today, the finance industry is mainly driven by technological innovations. An early reasoning about the rising importance of technology for financial sector in recent decades came from Van Horne (1985). He claims that the overall financial services industry is dominated by cost effectiveness and suggested that as the computer age has both brought a continual broadening of applications to the financial services industry and lowered the transactions costs, the role of technological advances in financial innovation has become crucial. In a similar vein, Fernandes (2005) suggests that financial development arises as a response to contractual needs of emerging technologies. Once a new technology arrives, this requires the establishment of new risk-sharing contracts. The underlying reason to that is the changing risk-profile with the new technology. The existence of new technology means

the existence of a new risk and the pricing as well as the sharing of this new risk among the economic agents calls for financial innovation. Addressing the technological progress as the main motive behind the introduction of new financial instruments, Fernandes asserts that financial development and economic growth are linked through the characteristics of technology, especially through risk sharing. Michalopoulos et al. (2009) also addressed the issue of financial innovation in order to examine its role in economic growth. In line with this purpose, they constructed a Schumpeterian endogenous growth model in which technological and financial innovations reflect the decisions of profit maximizing agents. Linking the financial and technological innovations, they found a positive correlation in between and suggested that financial and technological entrepreneurs interact to shape economic growth. Pointing out to the vital role of financial innovation in stimulating economic growth, they emphasized that technological innovation and economic growth will eventually stop unless financiers innovate.[19] Chou and Chin (2001) also found that financial innovations lead to long-run economic growth solely though technological innovation channel.

Within different kinds of technological advances, especially the relation between financial innovation and improvements in telecommunications and data processing has been searched in recent literature. Changes in those mentioned technologies have lead financial markets to become more sophisticated through the increasing rate and purposes of financial innovations. According to Awrey (2011), “There is little doubt that advances in information technology, telecommunications and financial theory over the course of the past half century have made a positive (gross) contribution toward the informational efficiency of financial markets”. In this regard, Tufano (2003) noted that various kinds of financial innovation, such as new methods of underwriting securities and new markets of securities, have emerged through IT (Information Technologies) and improvements in

[19] The study by Michalopoulos et al. (2009) is also original due to the following reasons. First, in their model, the actions of financiers are endogenized, i.e. financial entrepreneurs also innovate to maximize profit by seeking to create better screening technologies than their competitors. Second, they linked the financial and technological innovations.

telecommunications.

Frame and White (2009) also observed that technological changes relating to telecommunications and data processing have resulted in financial innovations, which have altered bank products and services and productions processes. Providing examples for the three major categories of financial innovations, which are new products and services; new production processes; and new organizational forms, their study showed how the advances in IT and financial theory have benefited financial innovations[20] Focusing on commercial banking, they also found that while substantial changes have been experienced in services and production technologies since the 1980s such as the use of applied statistics, statistically based risk measurement tools and credit scoring tools, no significant development has been experienced within new organization forms.

The Internet, as a particular information technology, led to crucial changes and developments to take place in the financial sector. As Varian (1998) asserted, financial services, especially stock market trading, have been one of the killer apps of the Internet. Pointing out the new trends in the financial services sector, the author also claimed that electronic trading, electronic agents for trading, exotic markets and securitization will all continue to be widely used in order to serve purposes such as forecasting public and private events, sharing risk and fighting against instability, during the future evolution of financial markets into “cybermarkets”.

Studies largely focus on Internet banking (online banking) since it clearly shows how significant has been the impact of the Internet both on financial innovation and the structure and performance of the financial services industry (Birch & Young, 1997; Jayawardhena & Foley, 2000; DeYoung, 2005; Arnaboldi & Claeys, 2009). However, most of those studies provide country-specific empirical researches and as a consequence, the extent of

[20] In this respect, they pointed out to asset securitization, stress-testing and Value-at-Risk (VAR) as being among the most popular approaches. In this study, they also claimed that there is still a little known about how and why financial innovations are initially developed.

research on this aspect is narrow in the literature.

As mentioned earlier, there is a dual relationship between technology and finance. Notwithstanding the fact that the literature has largely focused on the former relation running from technology to finance, the latter is not fully ignored. There are some studies that focused on this dual relation as well as on the particular relation running from finance to technological innovation.

The pioneering work of Faulhaber and Baumol (1988) drew attention to relation running from economics-their inventions and/or innovations, to the business and government sectors. It summarized the cases, where the contribution of economists is experienced, into four categories: (a) cases in which economists provided the actual invention and may have contributed to the innovation process (e.g. econometric techniques, *beta)*; (b) cases in which economists helped in the innovation process (e.g. discounted present value, Ramsey pricing); (c) cases in which economists provided an optimality formula for a concept previously introduced by others (e.g. peak-load pricing); and (d) cases in which economists acted primarily as disseminators of the ideas of others (e.g. marginal analysis). Diverged from what they anticipated, the authors reached the conclusion that economists' contribution to the innovation process is not significant. A criticism to this study came from Callon (2007) who assessed their results to be mixed and uneasy. According to Callon, this arises from Faulhaber and Baumol's choosing an innovation theory that considers innovation as a linear process, where research can play only one part: a necessarily episodic role in which it is the source of major innovations. This linear process is shown in Figure 1.

Figure 1: The linear process of innovation in Faulhaber and Baumol (1988)

Contrary to this linear approach, Callon suggested that using a non-linear conceptual model enables basic science to fit into the innovation process at any stage. When such an iterative and interactive model is taken, the contribution of economists to the economy becomes significant while their still presence remaining in technological change. Thus, different from the findings of Faulhaber and Baumol, Callon showed that the role of economists in financial innovation is necessarily important both for the economy and technological change.

Furthermore, financial innovations such as venture capital and angel investment sets out real-world examples for those studies, which are searching for this latter relation running from finance to technology. In fact, most of the studies points out to venture capital in order to show that a financial instrument can also aid innovative real activities. Hence, they contribute to the technological innovations and consequently, economic growth (Kortum & Lerner, 2000; Chou & Chin 2001; Mollica & Zingales 2007; Metrick & Yasuda 2010; Samila & Sorenson, 2011). However, when compared with the former relation, the effectiveness of the latter remains low and not very significant. As demonstrated, it is also an obvious fact from the literature since the focus is primarily set on the relation running from technology to finance.

The impact of technology on finance has primarily led financial markets to become more complex and sophisticated and the literature has recently started to put a specific focus on this. Regarding this, Schinckus (2008) introduced how new technology has integrated in the financial reality and claimed that the technological evolution mainly derives from e-finance and automatic trading, which has lead finance to become more computerized. Due to this double evolution, financial markets have become “hyper-markets”, where investors can do “financial shopping”, i.e. the “consumer-oriented” dimension of financial markets has become dominant. As largely pointed out in Schinckus study, the growing complexity and sophistication of financial markets is recently high on the agenda. Awrey (2011) also focuses on the issue of modern financial markets’ being *very* complex and advances

a financial innovation theory, which re-conceptualizes it as a process of change- but not necessarily one of improvement-influenced by, *inter alia*, financial intermediaries. He suggests that complexity is a function of two variables and these are; (i) information costs; (ii) bounded rationality. Comprehensively, he identifies six drivers of complexity of the modern financial markets and the nature and pace of financial innovation. These sources are: technology, opacity, interconnectedness, fragmentation, regulation and reflexivity. This study by Awrey is also influential in the sense that unlike the conventional view, which assumes financial innovations as a demand-side response to market imperfections; it focuses on the supply-side view in which financial intermediaries are the drivers of financial innovation. [21]

4.2. The Evolutionary Characteristic of Finance

As Takay and Özel (2008) argued, the notion of evolution should be seen as a guiding principle to understand the reality as an ensemble of emergent entities and processes, dissipative structures, self-organizational states and uncertainty.

If we think in terms of the financial sector, the evolutionary characteristic of finance gave the fruits of financial innovation at a rapid pace starting with the 1980s. Even though financial innovation was an existing fact even in the 17thand 18th centuries (see Miller, 1986), its popularity has rapidly risen in the late 20th century. Arising from this fact, it is appropriate to call for Schumpeter, who is widely regarded as the pioneering economist of evolutionary economics.

Festre and Nasica (2009) pointed out the fact that banks and financial intermediaries take an active role in the last stage of economic

[21] Awrey emphasizes that financial intermediaries as the primary suppliers of financial innovation has three main incentives to innovate. First, they innovate in response to the emergence of 'genuine' demand within the marketplace. Second, they innovate in response to mitigate the impact of various regulatory requirements. Third, they possess supply-side incentives with the intention of recreating the monopolistic conditions and this is usually afforded by the protection of intellectual property rights**.**

development[22]. They provide the means that is spent on the necessary capital and labor during the realization of innovation.[23] In this regard, they stated that financial innovations could be seen as many tools of adaptations to the dynamic tension existing between industrial and banking capital. This interpretation also attributes an important role to financial innovation since it takes an active role through the overall evolution of the financial system.

Schumpeter emphasized that economic development proceeds as an evolutionary process.

Schumpeter explains that,

> This is the formal nature of the process that periodically revolutionizes and innovates industrial life. It takes effect on all domains, creates new life forms everywhere. Its innermost meaning lies in the provision of new qualities of goods and in the reorganization of the economy in the direction of an ever increasing technological and commercial efficiency. (1912, p.492)

It takes then an evolution for financial institutions to take an active role in Schumpeter's theory. While banks and other financial intermediaries do not

[22] Schumpeter uses the term "development" while constructing his argument on creative destruction. (Ebner, 2000) distinguishes economic development and growth in Schumpeter's theory. He emphasizes that while economic growth denotes from external sources and causes slow, gradual and cumulative changes in the economic system; economic development results from discontinuous internal changes by economic innovations and causes structural changes business cycle fluctuations in the economy. Therefore, Schumpeter analyzes innovations mainly in the context of its role in the process economic development. Some works uses only the term "growth" as synonym of development (see Dinopoulos & Şener, 2007), while some works use both "growth and development" (see Ülgen (2012). Yet, growth and development cannot be considered as synonyms (Ebner, 2000). In this thesis, the terms "development" and "growth are used as synonym like Caballero (2008) and Dinopoulos and Şener (2007).

[23] Festre and Nasica (2009) explains that Schumpeter's analysis of Economic development has three pedagogical stages and these are: the circular flow; the steady state; and the development cases.

exist in the case of circular flow, they began to appear in the case of steady state growth as having the passive role of equalizing investment flows and savings in terms of guaranteeing the monetary flow. Arising from this, it can be claimed that the real and financial sectors of an economy are highly interrelated. As an important component of the financial sector, financial innovations also gain centrality in this frame (Festre & Nasica, 2009).

The fact that financial innovation produces primary waves of economic growth (Raines & Leathers, 2004) shows also the connectedness between real sector and financial sector. As the financial institutions play a direct role in economic development via their financing innovation purpose, a possible innovation in the financial sector definitely affects the real sector as it contributes to technological innovation by serving different sources for raising capital in larger amounts, enhancing financial instruments, and reducing or diversifying risk. Therefore, in most of the cases, financial innovation opens new doors for the realization of technological innovations.

In some cases, the relation running from the financial to the real sector also occurs vice versa. Some technological innovations also enable the realization of financial innovations and this mainly arises from the computerization of the financial sector. Thus, both sectors, indeed, are central for the development and sustainability of each other.

Today, technological evolution is among the most significant factors that shape the nature of the financial markets. The financial sector is heavily dependent on technological innovations, especially innovations in the information technology, telecommunications and data sourcing. In this regard, a development in especially these mentioned technologies have a direct impact on the financial industry due to the relation between the financial and technological innovations.

4.3. A Comparison between Schumpeter's Entrepreneurial Innovation and Financial Innovations

Schumpeterian innovation can be used in analyzing the dynamics of financial innovation since both entrepreneurial and financial innovations share similar characteristics, which is a fact that has especially occurred with the rising sophistication and complexity in the financial markets.

As mentioned before, it is in *The Theory of Economic Development* (1912/1934) that Schumpeter explains the types of entrepreneurial innovation; yet, none of these types do specifically address the innovations of the financial sphere. Schumpeter did not include financial innovation in his list of innovations (Raines & Leathers, 2004), but still, it is difficult to claim that he concentrated on technological innovation only of the real sector because, in his below taxonomy, he only explicitly addressed the innovations of the real sector in the fourth type and avoided placing a specific type of innovation on the others[24]. This enables making a reassessment on Schumpeter's innovation theory through adapting its context, process and characteristic into financial innovation.

Tufano (2003) mentioned that creating taxonomy is among the main challenges faced when dealing with financial innovation. Different pieces have created their own taxonomies on a case-by-case basis, depending upon what they aim to focus on. For instance, Finnerty (1988, 1992) categorized financial innovation regarding the function served by each type of financial instrument, whereas Dufey and Giddy (1981) chose to classify depending on the supply and demand factors, which gave a stimulus for financial innovation. The usual approach to financial innovation is to categorize it as (1) product innovation, which includes new financial instruments, contracts, techniques and markets; (2) process innovation, which refers to a new and improved production process; and (3) organizational innovation, which covers new institutions and organizational

[24] See Table 3: Types of Schumpeter's entrepreneurial Innovation and the usual approach for financial innovation

structures within financial products and services (Vargas, 2009). The usual approach enables taking the broadest perspective on financial innovation and is suitable for making a comparison between Schumpeter's five types of entrepreneurial innovation and financial innovation. Table 3 shows the types of Schumpeterian entrepreneurial innovation and the usual approach for financial innovation by using number and letter notations, respectively.

Table 3: Types of Schumpeter's entrepreneurial innovation and the usual approach for financial innovation

	Schumpeter's entrepreneurial innovation	Financial Innovation
TYPES	(1) A new good	(a) Product
	(2) A new market	
	(3) A new method of production	(b) Process
	(4) A new source of supply of raw-materials or half-manufactured goods	
	(5) A new organizational form	(c) Organizational

This section proceeds by comparing the types of financial innovations (a, b, c) with the Schumpeterian entrepreneurial innovations (1, 2, 3, 4, 5), respectively. What is aimed with this comparison is to show that while Schumpeter did not specifically addressed financial innovation, it can indeed, find a place among his types of entrepreneurial innovation due to the similarity in between. Hence, proposing a reinterpretation for financial innovation within a Schumpeterian framework is possible.

Product financial innovation (a) can be matched with the types of both a new good (1), and a new market (2) created by entrepreneurial innovation. This is due to various reasons. The source of the first reason arises from the technological evolution of the globalized financial system. As a consequence of the computerization and symbolization in the financial markets, its nature has changed and the “consumer-oriented” dimension of finance has grown, which can be illustrated by financial innovations (Schinckus, 2008). If we think in terms of today’s financial capabilities, a financial instrument in the sphere of ‘hyper-finance’ (see Schinckus, 2008) acts similar to a good in real life. Both a financial product and a new good can be sold for a non-negative price in the market they belong. Second, both have their own markets- goods and financial, where those goods and financial products can be bought and sold, i.e. exchanged.

Derivative markets can be taken as an instance. Basically, a derivative market is not so different from a market for electronic goods. The main activity is the same in both. An exchange activity takes place between the main parties, the buyer and seller, regardless from whether it is an exchange of tangible goods, liquid assets, or information. As a difference, for the use of financial products, usually a consumer needs another party in between. Furthermore, both markets facilitate trade as well as allocate resources. Third, even though a product financial innovation is not consumable as a new good (1), labor is a common factor of production for both entrepreneurial and financial innovations. The last common feature between a new good (1) and a product financial innovation (a) is that the latter can also act as an intermediary good. A product financial innovation can be used in a form of a new financial process, techniques or strategies, in the creation of another financial innovation (Blach, 2011). Thus, a product financial innovation exhibits very similar characteristics to a new good or a market and it can find a place among the types (1) and/or (2) of Schumpeterian entrepreneurial innovation.

Furthermore, process financial innovation (b) can be matched with a new method of production (3) since both address a change in the way of

implementation. However, there is a slight difference in between. In the case of entrepreneurial innovation, it refers to a change in the method of production, whereas for financial innovation, this new method does not concern only production. A process financial innovation refers to the underlying method of how new financial products are invented, introduced to the marketplace, and diffused (Hu, 1989). To put it differently, process financial innovation is not bounded with the production of new financial products and the production aspect is covered within. Therefore, this matching should make sense if you take, for instance, online banking and 3D modeling. The former is a process financial innovation that presents customers a new way of carrying out their financial transactions, while the latter is a technological innovation, which is used in the production process of the real sector. Still, both enable carrying out tasks, whether financial or not, in a new way that is more efficient and practical than previously.

Another aspect that shows the perfect match between a new method of production (3) and process financial innovation (b) is put by O'Riordan (2008). R&D needs to be applied differently to the normal "laboratory-based research associated with manufacturing" within the financial services sector since R&D is central both for real and financial sectors in stimulating innovation. O'Riordan suggested the issues on the functioning of R&D, such as examining collaborative innovation, the barriers that exist to RD&I, and patenting and intellectual property within the financial services sector. Among the issue of collaborative innovation, fostering academic-industry collaboration is both an important and a controversial one. In this regard, Lerner (2006) pointed out that while innovation in manufacturing industries has inspired literally thousands of academic studies, the number of studies on financial innovation is substantially lower. Providing the controversies regarding the academic-industry collaboration within the context of financial innovation, Lerner (2006) claimed that less profitable firms with strong academic ties innovate more.

So far, two types of financial innovation, (a) and (b), are matched with three of Schumpeter's entrepreneurial innovations, (1), (2) and (3). When it comes

to ‘a new source of supply of raw-materials or half-manufactured goods’ (4), a comparison has remained unfilled since (4) is directly related to the real sector and it cannot be adapted to the financial sector. Lastly, organizational innovation (c) can be easily macthed with a new organizational form of Schumpeter (5). There is no substantial distinction since both relate to a change in the organizational structure of a firm, whether it operates in the real or financial sector.

The above comparison shows that financial innovation shows quite similar characteristics to the Schumpeterian notion of innovation regarding it in three aspects. Yet, at this point, the mentioned similarities do not vest us with making an amalgam between financial and entrepreneurial innovations as the case of entrepreneurship within financial innovation is not explored, yet. The following section explores who performs a financial innovation?

4.4. The Performer of the Financial Innovation

It is well known that the performer of Schumpeter’s innovation is entrepreneur. In Schumpeter’s theory, entrepreneurs are referred as the “heroes of development” as through the innovation they introduce, they promote economic development. Entrepreneurs can also be thought as the soul giving life to the capitalist system because only with the spirit of entrepreneurship, a capitalist system can keep its functioning. Thus, the existence of entrepreneurships in capitalism is a very crucial element for the future of capitalism.

While entrepreneurship is clearly and completely associated to Schumpeter’s analysis of innovation, the case for financial innovation calls for a post-Schumpeterian analysis because Schumpeter hasn’t proposed a special anaylsis of the letter. The literature survey showed that the performer of financial innovation has not been questioned so far. As in the case of Schumpeter’s entrepreneurial innovation, this section asks if there is an entrepreneur behind financial innovation? Who designs and implements financial innovations?

It was shown in the earlier section that Schumpeter's entrepreneurial innovation and financial innovation share very similar characteristics. But, this similarity do not completely vest one to consider financial innovation as an entrepreneurial innovation. An inquiry into the financial innovation in the aspect of entrepreneurship is also necessary to make some predictions on the future of capitalism. As consequence, as the entrepreneurs who keep the capitalist system alive, the existence of the spirit of entrepreneurship within financial innovation can be thought as a circumstance that can postpone the end of capitalism.[25]

In the context of technological innovations, it is very common to experience industry-academy collaboration in order to improve R&D activities and stimulate innovation. This, as a consequence, spurs economic growth. Therefore, we similarly explore if other institutions such as research centers and universities have a role in the making of a financial innovation.

Those centers, both academic and non-academic, build a bridge in between financial institutions and knowledge in the finance industry. From one perspective, those people who are involved in such centers, whether academician or not, are all given the possibility to create an innovation for the finance sector in the spirit of an entrepreneur. The Milken Institute, founded in 1991, Center for Financial Services Innovation founded in 2004, Accenture Financial Services Center founded in 1989 and Center for Innovative Financial Technology, which was established in the Computational Research Division at Lawrence Berkeley National Laboratory set out an example in this respect. Consequently, it is claimed that these types of developments will act as a facilitator in the rise of entrepreneurship within financial innovation and this will make entrepreneurial and financial innovations share even more common features then they used to. In this path, the Schumpeterian notion of entrepreneurial innovation will be a useful guide in analyzing not only the

[25] In *Capitalism, Socialism and Democracy (1942),* Schumpeter asserted that capitalism will come to an end due to its very success. Thus, he did not believe that capitalism will be able to survive.

developments and changes in finance, but also providing some future prospects about the future of capitalism.

Financial innovations are everywhere: Automated Teller Machines (ATM), credit cards, online banking, Electronic Fund Transfers (EFT), the Euro, derivatives, stock markets, and hundreds of others. Most of those different types of financial innovations have been made available through financial institutions. While those financial institutions increased in number as the financial services served to customers have become diversified, a role for Schumpeterian entrepreneurship has also emerged in the financial sector. Today's financial industry and its growing facilities enable one to become an entrepreneur of financial innovation, especially in telecommunications and data sourcing. Recently, financial innovations have begun to be served in the form of Internet applications and facilities, which is a new development in the financial sector. Most of these financial innovations provide free, online financial service for users and they have brought a new meaning to the notion of financial innovation by expanding the services served to customers in an unusual way. Indeed, these new examples have become so popular that for instance, in Forbes magazine, the list of top financial innovations that make our lives easier in 2012 are all related to the mentioned kind of financial innovations.[26] Here, it is appropriate to ask who performs those applications? Is it entrepreneurs or financial institutions?

Those new kinds of financial innovations that the financial world was not familiar with until very recently, are not merely served via financial institutions. All are new websites and applications that are formed in order to serve customers an easy and practical way for their carrying out various financial purposes. Rather than a financial institution, this primarily requires someone with entrepreneurial skills. By way of new facilities through the technological advances, today, an entrepreneur can create an innovative idea in finance and realize it. This clearly shows that it is not only financial

[26] Retrieved from http://www.forbes.com/sites/moneywisewomen/2012/01/10/10-financial-innovations-that-make-your-life-easier-in-2012/

institutions that can realize a financial innovation. Today, the performer of a financial innovation can also be an individual who has entrepreneurial skills.

4.5. "Backwards" Rationalization Process within Financial Innovation

This rising trend in the financial world can be explained within the framework Schumpeter's "rationalization" process, where the innovation making activity becomes routinized (Schumpeter, 1942, p.132).

According to Schumpeter (1942):

> This social function is already losing importance and is bound to lose it at an accelerating rate in the future even if the economic process itself of which entrepreneurship was the prime mover went on unabated. For, on the one hand, it is much easier now than it has been in the past to do things that lie outside familiar routine-innovation itself is being reduced to routine. Technological progress is increasing becoming the business of teams of trained specialists who turn out what is required and make it work in predictable ways. (p.133)

During the "rationalization" process, entrepreneurs become employed in big firms and eventually the spirit of entrepreneurship disappears from the capitalist scene as they lose importance in a system where the economic progress tends to become depersonalized and automatized (Schumpeter, 1942, p. 133). The rationalization process is shown in Figure 2.

This thesis suggests that Schumpeter's rationalization process has become a "backwards" rationalization process in the case of financial innovation as shown in Figure 3. This arises simply from the following fact. Until the recent years, it was only the 'large firms' mainly the financial sector that were introducing and implementing financial innovations; whereas today, the rising of an entrepreneurship is observed in this area. Breaking up the ties with the firms, today, individuals are, to some extent, capable of introducing a financial innovation on their own. Since the end of the capitalist system

comes through the rationalization process, a “backwards” rationalization process can serve as a condition to postpone this end.

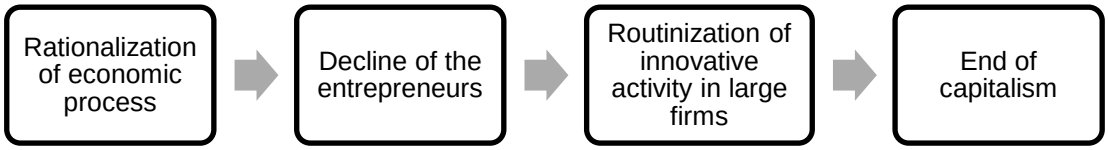

Figure 2: Schumpeter’s rationalization process

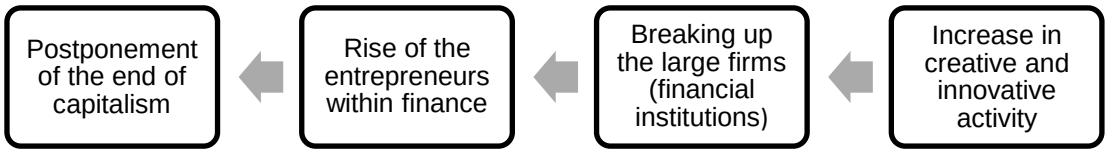

Figure 3: “Backwards” rationalization process

This chapter pointed out the interdependence between the real and financial sectors due mainly to the factor of technology. First, it showed that there is a relation running both from technological advances to financial innovation and vice versa. The strong dependence of the financial sector to the technological advances have caused the financial sector to go through an evolution in which it has become more complex and more related to the Schumpeter’s entrepreneurial innovations. Then, through a comparative analysis, this chapter showed the great similarity between the Schumpeterian entreprenurial innovation and financial innovation. In order to understand if financial innovation can be considered as a Schumpeterian type of

innovation, this chapter also explored who the performer of financial innovation is. This constitutes a unique contribution to the literature since such a question has not been explored before. This chapter also pointed out to the rising entrepreneurial skills in the sphere of finance. Arising from this rising trend of entrepreneurship, it also analyzed the Schumpeter's rationalization process within financial innovation. The analysis of Schumpeter's "rationalization" process for financial innovation has led into the finding of a new, unique, proposal and that is called as "backwards" rationalization process. It is suggested that "backwards" rationalization process may also be useful in making predictions for the future of capitalism and be regarded as a new factor to postpone the end of capitalism.

CHAPTER 5

CONCLUSION

In this thesis, it is shown that the notion of Schumpeter's entrepreneurial innovation is mainly related to the real sector rather than the financial sector. While Schumpeter centralized innovations for the economic development and the functioning of capitalism, he referred to the innovations of the real dynamics and preferred not to extend the notion of innovation to the financial sphere. Therefore, it is claimed that financial innovations are left unexplored in Schumpeter's theory. Arising from this, Schumpeter's innovation theory is used as a guide to understand the dynamics of financial innovations today. Pointing out the similarity in between Schumpeter's entrepreneurial innovation and financial innovation in different respects, this thesis aimed to show that the latter can be analyzed within the context of the former by using a post-Schumpeterian approach.

Financial innovations have being used over the past few decades; however, it has only begun to be popular starting with the second half of the 20th century. It is mentioned that the global crisis sets as a milestone in the evolution of the financial innovations as it exposed the new financial system to view, in which the financial innovation has not only gained a substantial role but also caused a structural change in the nature of financial markets. Arising from the interrelation between the financial sector and technology, the financial world has been through an evolution, which has also caused the nature of financial markets to change as reflected by the financial innovations. Therefore, in this thesis, a post-Schumpeterian perspective is developed in order to describe the evolution of the capitalist system. Through

this evolution, it is shown that there is a strong interrelation between the real and financial sectors via the technological advances, which caused growing sophistication and computerization of the financial markets.

Furthermore, taking Schumpeter's innovation theory as a guide, entrepreneurial innovations and financial innovations are compared in three different respects: taxonomy, creative destruction process and entrepreneurship. Regarding the first comparison, it is shown that the context of financial innovations enables it to be placed under all types of Schumpeter's innovation with only one expection.

Financial innovation cannot be placed only under the type of a new source of supply of raw-materials or half-manufactured goods since this type directly refers to the real sector. Regarding the creative destruction process, it is shown that the general opinion in the literature is to assume the process of creative destruction to turn into a destructive creation process in the case of financial innovations. However, this thesis argued that it is possible to attribute a role to financial innovations during the process of creative destruction. The main reason is suggested to arise from the relation between financial innovations and economic growth through the factor of technology.

Regarding the last comparison, this thesis pointed out the increasing role of entrepreneurship within financial innovation. Questioning the performer of financial innovation and the exploration of entrepreneurship within the financial innovation also serves a unique contribution of this thesis to the literature. It is found that there is a new trend in the financial world and this can be observed through the rising entrepreneurship within financial innovations. A new trend has begun to be experienced in the realm of finance as there is a rising wave of possibilities for regular individuals to introduce their financial innovations. Having analyzed the rationalization process of Schumpeter, in this thesis, it is claimed that this process turns out to be a "backwards" rationalization process in the case of financial innovation. Recently the focus is moving away from "large firms" into individuals by way of increasing and improving technological facilities. Arising from this, it is

argued that the direction of the rationalization process of Schumpeter's entrepreneurial innovation can be adapted to the financial innovation in the reverse direction. This has led to the finding of a new process which is called as "backwards" rationalization.

Lastly, it is shown that "backwards" rationalization process serves as a new interpretation for the future of capitalism by suggesting that a rise in the entrepreneurship within financial innovation can act as a new circumstance in the postponement of the end of the capitalism. Primarily these finding of this thesis, which are the rise of entrepreneurship within financial innovations and the reinterpreretation of Schumpeter's rationalization process in which it becomes a "backwards" rationalization process for financial innovations, are expected to contribute to the literature and shed a new light for further research.

REFERENCES

Acemoglu, D., & Cao, D. (2011). *Innovation by Entrants and Incumbents. (*NBER Working Paper No. 16411). Retrieved from the National Bureau of Economic Research website: http://www.nber.org/papers/w16411

Aghion, P., & Howitt, P. (1992). "A Model of Growth Through Creative Destruction. *Econometrica, 60*(2), 323-351.

Akhavein, J., Frame, S. W., & Lawrence, W. J. (2005). The Diffusion of Financial Innovations: An Examination of the Adoption of Small Business Credit Scoring by Large Banking Organizations. *The Journal of Business, 78*(2), 577-596.

Alcouffe, A., & Kuhn, T. (2004). Schumpeterian endogenous growth theory and evolutionary economics. *Journal of Evolutionary Economic, 14*(2), 223-236.

Allen, F. (2012). Trends in Financial Innovation and their Welfare Impact: an Overview. *European Financial Management, 18*(4), 493–514.

Allen, F., & Gale, D. (1988). Optimal Security Design. *Review of Financial Studies, 1*(3), 229-263.

Allen, F., & Gale, D. (1994). *Financial Innovation and Risk Sharing.* Cambridge, MA: MIT Press.

Allen, R. L. (1991). *Opening Doors: The Life and Work of Joseph Schumpeter.* London: Transaction.

Andersen, E. S. (1992). The Difficult Jump From Walrasian to Schumpeterian Analysis. *IKE Working Papers 78,* Institute for Production, Aalborg University.

Andersen, E. S. (2011). *Joseph A. Schumpeter: A Theory of Social and Economic Evolution.* Palgrave Macmillan.

Araz, B. & Özel, H. (2008). *Schumpeter and the Evolutionary Economics: Three Conceptual Issue*s. Paper presented to the 12th Annual Conference of the European Society for the History of Economic Thought: "Development and Transition in the History of Economic Thought," Prague, Czech Republic. Retrieved from http://yunus.hacettepe.edu.tr/~ozel/Bahar_Schumpeter.pdf

Awrey, D. (2011). Regulating Financial Innovation: A More Principles-based Alternative? *Brooklyn Journal of Corporate, Financial and Commercial Law 273, 5*(2).

Aydın, D. G., & Takay, B. A. (2012). Schumpeterian Business Cycles: Innovations, Bubbles and Global Crises. *International Journal of Humanities and Social Science, 2*(7), 123-128.

Bank for International Settlements (1986). *Recent innovations in international banking*. Bank for International Settlements Report dated April 1986.

Barrell, R., & Davis, P. E. (2008). The Evolution of the Financial Crisis of 2007-08. *National Institute Economic Review, 206*(1), 5-14.

Basılgan, M. (2010). Alman Tarihçi Okulu'nun Joseph Alois Schumpeter Üzerine Etkis. *Ankara Üniversitesi Siyasal Bilgiler Fakültesi Dergisi, 65*(3), 24-50.

Baudrillard, J. (1994). *Simulacra and Simulation.* Ann Barbor: University of Michigan Press.

Beck, T., Chen, T., Lin, C., & Song, F. M. (2012). *Financial Innovation: The Bright and the Dark Sides. Working Papers 052012, Hong Kong Institute for Monetary Research*.

Ben-Horim, M., & Silber, W. (1977). Financial innovation: A linear programming approach. *Journal of Banking and Finance*, 277-296.

Bhagwati, J. (2008). We need to guard against creative destruction. *Callaloo, 31*(4), 1026-1027.

Birch, D., & Young, M. A. (1997). Financial services and the Internet - what does cyberspace mean for the financial services industry. *Internet Research, 7*(2), 120 – 128.

Blach, J. (2011). Financial Innovations and their Role in the Modern Financial System-Identification and Systemization of the Problem. *Financial Internet Quarterly „e-Finanse", 7*(3), 13-26.

Blommestein, H. J. (2012). Financial Innovations and the Risk Paradox. Retrieved March 16, 2013, from http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2033157

Boot, A. W., & Thakor, A. V. (1993). Security Design. *Journal of Finance, 48*(4), 1349-1378.

Boot, A. W., Marinč, M. "., & 2011-06, A. C. (2011). Financial Innovations, Marketability and Stability in Banking. In J. Bath, C. Lin, & C. Wihlborg (Eds.), *Handbook On Banking And Governance.*

Boz, E., & Mendoza, E. G. (2010). *Financial Innovation, the Discovery Of Risk, and the U.S. Credit Crisis* (NBER Working Paper Series, No.16020) Retrieved from the National Bureau of Economic Research website: http://www.nber.org/papers/w16020

Burlamaqui, L. (2000). Schumpeterian Competition, Financial Innovation and Financial Fragility: An Exercise in Blending Evolutionary Economics with Minsky's Macrofinance. In D. a. 8th Schumpeter Conference Change (Ed.). Manchester, U.K,.

Caballero, R. J. (2008). Creative Destruction. In S. N. Durlauf, & L. E. Blume (Eds.), *The New Palgrave Dictionary of Economics.* Palgrave MacMillan.

Callon, M. (2007). What Does It Mean to Say that Economics is Performative? On the Performativity of Economics. In D. Mackenzie, F. Muniesa, & L. Si (Eds.), *Do Economists Make Markets?* Princeton, NJ: Princeton University Press.

Calomiris, C. (2009). *Banking Crises and the Rules of the Game.* (NBER Working Papers 15403*).*Retrieved from the National Bureau of Economic Research website: http://www.nber.org/papers/w15403

Campbell, T. (1988). *Money and Capital Markets.* Glenview, IL: Scott, Foresman.

Cecchetti, S., & Kharroubi, E. (2012). Reassessing the impact of finance on growth. *BIS Working Papers 381*.

Chou, Y. K. (2007). Modeling Financial Innovation and Economic Growth: Why the Financial Sector Matters to the Real Economy. *The Journal of Economic Education, 38*(1), 78-90.

Chou, Y. K., & Chin, M. S. (2001). Financial Innovations and Endogenous Growth. *Research Paper 804, University of Melbourne, Department of Economics,*. Melbourne, Victoria.

Claeys, P. & Arnaboldi, F. (2009). Internet Banking in Europe: A Comparative Analysis. Retrieved February 12, 2013 from http://ssrn.com/abstract=1343684

Courvisanos, Jerry (2012). *Analysing Discontinuous Innovation: Some Implications of Schumpeter's The Theory Of Economic Development*, Paper presented at the annual meeting of 25th HETSA Conference, Melbourne, Australia, 2012. Retrieved from http://www.hetsa.org.au/hetsa2012/abstracts_index.html

Crotty, J. (2009). Structural causes of the global financial crisis: a critical assessment of the 'new financial architecture. *Cambridge Journal of Economics, 33*(4), 563-580.

Das, D. K. (2006). Globalization in the World of Finance: An Analytical History. *Global Economy Journal, 6*(1), 1-25.

Demir, Ö. (1995). Joseph A. Schumpeter: Hayatı, Eserler ve Katkıları. *Ankara Üniversitesi Siyasal Bilgiler Fakültesi Dergisi, 1*(1), 155-172.

DeYoung, R. (2005). The performance of Internet-based business models: evidence from the banking industry. *Journal of Business, 78*(3), 893-947.

Diamond, A. M. (2009). Schumpeter Vs. Keynes: "In The Long Run Not All Of Us Are Dead. *Journal of the History of Economic Thought, 31*(4), 531-541.

Dinopoulos, E., & Şener, F. (2007). New Directions in Schumpeterian Growth Theory. H. Hanusch, & A. Pyka (Dü) içinde, *Elgar Companion to Neo-Schumpeterian Economics.* Cheltenham: Edward Elgar.

Dosi, G., Fagiolo, G., & Roventini, A. (2010). Schumpeter meeting Keynes: A policy-friendly model of endogenous growth and business cycles. *Journal of Economic Dynamics and Control, 34*(9), 1748-1767.

Dufey, G., & Giddy, I. (1981). Innovation in the International Financial Markets. *Journal of International Business Studies, 12*(2), 33-51.

Duffie, D., & Rahi , R. (1995). Financial Market Innovation and Security Design: An Introduction. *Journal of Economic Theory, 65*(1), 1-42.

Ebner, A. (2000). *Schumpeterian Theory and the Sources of Economic Development: Endogenous, Evolutionary or Entrepreneurial?* Paper presented at the International Schumpeter Society Conference on 'Change, Development and Transformation: Transdisciplinary Perspectives on the Innovation Process'. Manchester.Retrieved from http://www.cric.ac.uk/cric/events/schumpeter/papers/71.pdf

Eichengreen, Barry (2010), "The Crisis in Financial Innovation," Remarks on the occasion of the award of the Schumpeterian Prize of the International Schumpeter Society, Vienna, 20 January 2010. Retrieved March 15, 2013 from http://www.econ.berkeley.edu/~eichengr/crisis_finan_innov.pdf

Engelen, E., Erturk, İ., Froud, J., Leaver, A., & Williams, K. (2010). Reconceptualizing financial innovation: frame, conjuncture and bricolage. *Economy & Society, 39*(1), 33-63.

Fagerberg, J. (2009). A Guide to Schumpeter. In W. Østreng (Ed.), *Confluence. Interdisciplinary Communications 2007/2008.* Oslo: Centre for Advanced Study.

Faulhaber, G. R., & Baumol, W. J. (1988). "Economists as Innovators: Practical Products of Theoretical Research. *Journal of Economic Literatur, 26*(2), 577-600.

Fernandes, Ana (2005). Knowledge, Technology Adoption and Financial Innovation, Retrieved April 20, 2013 from http://ssrn.com/abstract=954743 or http://dx.doi.org/10.2139/ssrn.954743

Festre, A., & Nasica, E. (2009). Schumpeter on money, banking and finance: an institutionalist perspective. *European Journal of the History of Economic Thought, 16*(2), 325-356.

Finnerty, J. D. (1988). Financial Engineering in Corporate Finance: An Overview. *Financial Management, 17*(4), 14-33.

Finnerty, J. D. (1992). An Overview of Corporate Securities Innovation. *Journal of Applied Corporate Finance, 4*(4), 23-39.

Frame, S. W., & White, L. J. (2009). Technological change, financial innovation, and diffusion in banking. *Federal Reserve Bank of Atlanta Working Paper 2009-10*.

Frame, S., & White, L. (2004). Empirical Studies of Financial Innovation: Lots of Talk, Little Action? *Journal of Economic Literature, 42*(1), 116-144.

Gergen, M. P., & Schmitz, P. (1997). The Influence of Tax Law on Securities Innovation in the United States: 1981-1997. *Tax Law Review, 52*(2), 119-174.

Gilchrist, Simon, Zakrajsek, Egon (2008). Linkages Between the Financial and Real Sectors: An Overview, Prepared for the Academic Consultants Meeting, "Financial Stability and Linkages Between Financial and Real Sectors," Federal Reserve Board, October 3, 2008. Retrieved from http://people.bu.edu/sgilchri/BOG_Gilchrist_Zakrajsek_24sep2008.pdf

Goldsmith, R. W. (1969). *Financial Structure and Developmen.* New Haven: Yale University Press.

Greenspan, A. (2002). Federal Reserve Board's Semiannual Monetary Policy Report to the Congress, The Federal Reserve Board, Washington DC, 27 February

Heller, Michael G. (2012). Schumpeter Calls Krugman. Project Syndicate, Retrieved April 26, 2013 from http://www.project-syndicate.org/blog/schumpeter-calls-krugman

Henderson, B. J., & Pearson, N. D. (2011). The dark side of financial innovation: a case study of the pricing of a retail financial product. *Journal of Financial Economics, 100*(2), 227-247.

Hicks, J. (1969). *A Theory of Economic History.* Oxford: Oxford University Press.

Howitt, P. (2000). Endogenous Growth and Cross-Country Income Differences. *The American Economic Review, 90*(4), 829-846.

Hu, H. (1989). Swaps, the Modern Process of Financial Innovation and the Vulnerability of a Regulatory Paradigm. *University of Pennsylvania Law Review, 138*(2), 333-435.

Jayawardhena, C., & Foley, P. (2000). Changes in the banking sector – the case of Internet banking in the UK. *Internet Research, 10*(1), 19 - 31.

Johnson, S., & Kwak, J. (2012). Is Financial Innovation Good for the Economy? *Innovation Policy and the Economy, 12*(1), 1-16.

Kane, E. (1983). Policy Implications of Structural Changes in Financial Markets. *American Economic Review, 73*(2), 96-100.

Kane, E. J. (1986). Interaction of Financial and Regulatory Innovation. *The American Economic Review, 78*(2), 328-334.

Keklik, M. (2003). *Schumpeter, Innovation and Growth: Long-Cycle Dynamics in the Post-Wwii American Manufacturing Industries.* Hampshire, UK.: Ashgate Publishing, Ltd.

Keynes, J. M. (1936). *The General Theory of Employment, Interest and Money.* London, UK.: Macmillan.

Khan, M. S., & Semlali, A. S. (2000). Financial Development and Economic Growth: An Overview. *IMF Working Papers 00/209*.

Kimmel, P. D., Weygandt, J. J., & Kieso, D. E. (2010). *Financial Accounting Tools for Business Decision Making* (6 ed.). Hoboken, New Jersey: John Wiley Publishers.

King, R. G., & Levine, R. (1993, August). Finance and growth: Schumpeter might be right. *Quarterly Journal of Economics, 108*(3), 717-737.

King, R. G., & Levine, R. (1993, December). Finance, entrepreneurship and growth: Theory and evidence. *Journal of Monetary Economics, 32*(3), 513-542.

Knell, Mark (2012). Schumpeter, Minsky and the financial instability hypothesis. Retrieved April 26, 2013 from http://www.aomevents.com/media/files/ISS%202012/ISS%20SESSION%204/Knell.pdf

Knoll, M. S. (2004). The Ancient Roots of Modern Financial Innovation: The Early History of Regulatory Arbitrage. *Oregon Law Review, 87*, 93-116.

Kortum, S., & Lerner, J. (2000). Assessing the impact of venture capital on innovation. *Rand Journal of Economics, 31*(4), 674-692.

Krishnamurthy, A. (2009). Amplification Mechanisms in Liquidity Crises. *American Economic Journal, 2*(2), 1-33.

Kuznets, S. (1955). Economic Growth and Income Inequality. *American Economic Review, 45*(1), 1-28.

Legrand, D.-P. M., & Hagemann, H. (2007). Business Cycles in Juglar and Schumpeter. *The History of Economic Thought, 49*(1), 1-18.

Lerner, J. (2002). Where does state street lead? A first look at finance patents, 1971 to 2000. *Journal of Finance*, 901-930.

Lerner, J. (2006). The New New Financial Thing: The Origins of Financial Innovations. *Journal of Financial Economics, 79*(2), 223-255.

Levich, R. M. (1988). Financial Innovations in International Financial Markets. *NBER Working Paper Series, No.2277*.

Lucas, R. E. (1988). On the mechanics of economic development. *Journal of Monetary Economics, 1*, 3-42.

Marty, A. L. (1961). Gurley and Shaw on Money in a Theory of Finance. *Journal of Political Economy, 69*(1), 56-62.

Mason, J. R. (2008). The Summer of '07 and the Shortcomings of Financial Innovation. *Journal of Applied Finance, 1*, 8-15.

McCraw, T. K. (2007). *Prophet of Innovation: Joseph Schumpeter and Creative Destruction.* Cambridge, MA: Harvard University Press.

McFadyen, L. (2008). *The Viennese Influence on Schumpeter,* Unpublished paper presented at the annual meeting of 21st HETSA Conference, Sydney, Australia. Retrieved February 30, 2013 from http://www.mannkal.org/scholars.php?id=45

Mckinnon, R. I. (1973). *Money and Capital in Economic Development.* Washington D.C: Brookings Institution.

Merton, R. C. (1990). The Financial System and Economic Performance. *Journal of Financial Services Research, 4*(4), 263-300.

Metrick, A., & Yasuda, A. (2010). Venture Capital and Other Private Equity: A Survey. *NBER Working Papers 16652*.

Michaelides, P. G., & Milios, J. G. (2009). Joseph Schumpeter and the German Historical School. *Cambridge Journal of Economics, 33*(3), 495-516.

Michalopoulos, S., Laeven, L. A., & Levine, R. (2009). Financial Innovation and Endogenous Growth. *NBER Working Paper Series, No. 15356.*

Miller, M. H. (1986). Financial innovation: The last twenty years and the next. *Journal of Financial and Quantitative Analysi, 21*(4), 459-471.

Miller, M. H. (1991). Leverage. *Journal of Finance, 46*(2), 479-488.

Minsky, H. P. (1990). *Schumpeter: finance and evolution, in Evolving Technology and Market Structure: Studies in Schumpeterian Economics.* (A. Heertje, & M. Perlman, Dü) Ann Arbor: University of Michigan Press.

Mishkin, F. S. (1991). Financial Innovation and Current Trends in U.S. Financial Markets. *NBER Working Papers 3323*.

Mishra, Pabitra K. (2008). Financial Innovation and Economic Growth - A Theoretical Approach. Retrieved April 24, 2013 from http://ssrn.com/abstract=1262658

Mollica, M. A., Zingales, L. (2007). The impact of venture capital on innovation and the creationof new businesses, Unpublished working paper, University of Chicago.

O'Riordan, S. (2008). Research and Development in Financial Services and the Role of Innovation. *Financial Innovation Centre of University College of Cork*.

Park, Y.-S. (2009). The Role of Financial Innovations in the Current Global Financial Crisis. *Seoul Journal of Economics, 22*(2), 123-144.

Perez, C. (. (2004). Finance and technical change: A long-term view. In H. Hanusch, & A. Pyka (Eds.), *The Elgar Companion to Neo-Schumpeterian Economics* (pp. 775-99). Cheltenham: Edward Elgar.

Persons, J. C., & Warther, V. (1997). "Boom and bust patterns in the adoption of financial innovations. *Review of Financial Studies, 10*(4), 939-967.

Phillips, K., & Wrase, J. (1999). "Schumpeterian growth and endogenous business cycles. *Working Papers 99-20, Federal Reserve Bank of Philadelphia.*

Plehn-Dujowich, Jose M., Li, Dunli (2010). The Impact of Entrepreneurship on Schumpeterian Endogenous Growth: Theory and Evidence. Unpublished manuscript.

Pol, E. (2009). *Regulating financial innovations without apology.* Retrieved December 28, 2012, from http://ro.uow.edu.au/commwkpapers/201/

Raines, P. J., & Leathers, C. G. (2004). The Schumpeterian role of financial innovations in the New Economy's business cycle. *Cambridge Journal of Economics, 28*, 667-681.

Rajan, R. G., & Zingales, L. (1988). "Financial dependence and growth. *American Economic Review, 88*(3), 559-586.

Ramsay, I. (1993). Financial Innovation and Regulation: The Case of Securitisation. *Journal of Banking and Finance Law and Practice*, 169-174.

Ross, S. A. (1989). Institutional Markets, Financial Marketing, and Financial Innovation. *The Journal of Finance, 44*(3), 541-556.

Roubini, N., & Sala-I-Martin, X. (1992). Financial repression and economic growth. *Journal of Development Economics, 39*(1), 5-30.

Sánchez, M. (2010). Financial Innovation and the Global Crisis. *International Journal of Business and Management, 5*(1), 26-31.

Schinckus, C. (2008). The Financial Simulacrum: The consequences of the symbolization and computerization of the financial market. *Journal of Socio-Economics, 73*(3), 1076-1089.

Schrieder, G., & Heidhues, F. (1995). Reaching the poor through financial innovations. *Quartely Journal of International Agricultur, 34*(2), 132-148.

Schumpeter, J. A. (1908). *Das Wesen und der Hauptinhalt der theoretischen Nationaloekonomie.* Munich and Leipzig: Dunker und Humblot.

Schumpeter, J. A. (1928). The Instability of Capitalism. *The Economic Journal, 38*(151), 361-368.

Schumpeter, J. A. (1934). *The theory of economic development; an inquiry into profits, capital, credit, interest, and the business cycle* probabilities (R. Opie, Trans.). Cambridge, MA: Harvard University Press (Original work published 1912).

Schumpeter, J. A. (1939). *Business Cycles: A Theoretical, Historical, and Statistical Analysis of the Capitalism Process.* New York: McGraw-Hill.

Schumpeter, J. A. (1950 [1942]). *Capitalism, Socialism and Democracy*, New York: Harper&Brothers Publishers.

Schumpeter, J. A. (1951). *Ten Great Economists: From Marx to Keynes.* New York: Oxford University Press.

Schumpeter, J. A. (1954). *History of Economic Analysi.* New York: Oxford University Press.

Shaw, E. (1973). *Financial Deepening in Economic Development.* New York: Oxford University Press.

Silber, W. (1975). *Financial Innovation.* Lexington, MA: Heath.

Silber, W. L. (1983). The Process of Financial Innovation. *American Economic Review, 73*(2), 89-95.

Smith, C., Smithson, C., & Wilford, D. (1989). Managing Financial Risk. *Journal of Applied Corporate Finance, 1*(4), 27-48.

Soete, L. (2011, November). *"Maastricht Reflections on Innovation.* Retrieved from http://www.sg.unimaas.nl/_OLD/oudelezingen/Tans%20Lecture%2010%20Nov%202011%20Luc%20Soete.pd

Soete, L., & Weel, B. (1999). Schumpeter and the Knowledge-Based Economy: On Technology and Competition Policy. *MERIT, Maastricht Economic Research Institute on Innovation and Technology*(004).

Stein, J. H. (1991). Finanzinnovationen. *Das Wirtschaftsstudium, 1*, 43-47.

Tett, G. (2009, March 10). *"Lost through destructive creation*. Retrieved from Financial Times: http://www.ft.com/cms/s/0/95992eee-0d12-11de-a555-0000779fd2ac.htm

The World Economic Forum (2012). *Rethinking Financial Innovation Reducing Negative Outcomes While Retaining The Benefi*ts. The World Economic Forum. Retrieved March 6, 2013 from http://www3.weforum.org/docs/WEF_FS_RethinkingFinancialInnovation_Report_2012.pdf

Tilburg, R. Van (2009). Finance for Innovation: Policy options for improving the financial component of the Dutch innovation system. Retrieved November 4, 2012 from http://www.awt.nl/upload/documents/publicaties/tekst/as36.pdf

Tucker, D. P. (1976). Financial Innovation and the Mortgage Market: The Possibilities for Liability Management by Thrifts. *Journal of Finance, 31*(2), 427-437.

Tufano, P. (1989). Financial innovation and first mover advantages. *Journal of Financial Economics, 25*(2), 213-240.

Tufano, P. (2003). Financial innovation. In G. M. Constantinides, M. Harris, & R. M. Stulz (Eds.), *Handbook of Economics and Finance* (Vol. I, pp. 307-335). Elsevier.

Ülgen, F. (2012). Is the Financial Innovation Destruction Creative ?A Schumpeterian Reappraisal. *Journal of Innovation Economics, 1*(11), 231-249.

Van Horne, J. C. (1985). Of financial innovations and excesses. *Journal of Finance*, 621-631.

Vargas, A. R. (2009). Assessing the contribution of financial innovations to the production of implicit services of financial intermediation in Costa Rica. *Proceedings of the IFC Conference on "Measuring financial innovation and its impact"*, *31*, pp. 445-466. Basel.

Varian, H. R. (1998). Effect of the Internet on Financial Markets. *School of Information Management and Systems, University of California, Berkeley*.

White, L. J. (2000). Technological change, financial innovation, and financial regulation in the U.S.: The challenge for public policy. In P. Harker, & S. Zenios (Eds.), *Performance of Financial Institutions.* Cambridge: Cambridge University Press.

Wolfe, D., Davis, C. H., Hepburn, N., Mills, N., & Moore, G. (2011). *Innovation and Knowledge Flows in the Financial Services and ICT Sectors of the Toronto Region.* Retrieved from http://www.utoronto.ca/progris/pdf_files/Toronto%20FS-IT%20Report_Final%20Version%2010November11.pdf

Xuan, L., & Shihong, Z. (2010). Finance Innovation Model Literature Review. *Proceedings of 2010 International Conference on Regional Management Science and Engineering.*

TEZ FOTOKOPİSİ İZİN FORMU

ENSTİTÜ

Fen Bilimleri Enstitüsü ☐

Sosyal Bilimler Enstitüsü ☐

Uygulamalı Matematik Enstitüsü ☐

Enformatik Enstitüsü ☐

Deniz Bilimleri Enstitüsü ☐

YAZARIN

Soyadı : Bulgurluoğlu
Adı : Pelin
Bölümü : İktisat

TEZİN ADI: The Nature of Financial Innovations: A Post-Schumpeterian Analysis

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 (1) yıl süreyle fotokopi alınamaz. ☐

TEZİN KÜTÜPHANEYE TESLİM TARİHİ: