ANALYSIS OF LOCAL SECTORAL POLICIES VIA SYSTEM DYNAMICS APPROACH: THE CASE OF ALANYA TOURISM SECTOR

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ABSTRACT

ANALYSIS OF LOCAL SECTORAL POLICIES
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THE CASE OF ALANYA TOURISM SECTOR

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The purpose of this work is indicating System Dynamics Approach to be an appropriate tool for analysis of policies suggested for local sectors. Local sectors are very important for stability of the country's economy as well as welfare of the local community. Therefore, feasible and effective policies should be created and implemented in order to contribute to the local sectoral development. But before any policy implementation, policy analysis is required on to evaluate whether effectiveness and feasibility would be ensured in alternative policies. In this study, firstly the issues of Local Sectoral Dynamics and Policies are examined and specifically, the situation in Alanya Tourism Sector is studied. Afterwards, in accordance with policy analysis steps, problems of Alanya Tourism Sector are detailed and alternative policies that would aid in solution of the problem are idenfined. For evaluation of alternative policies, Dynamics of Alanya Tourism Sector

are modeled by System Dynamics approach and the ‘Formal Model’ is implemented in Stella 9.0.1. The model is simulated for all policy alternatives and the policy outcomes of each alternative are forecasted. Finally the performance of each policy are evaluated using the previously established criteria and combined policies having more superior outcomes than the present ones are created.

Keywords: Local Sectors, Policy Analysis, Alanya Tourism Sector, System Dynamics, Evaluation of Policies.

ÖZ

YEREL SEKTÖR POLİTİKALARININ
SİSTEM DİNAMİĞİ YAKLAŞIMIYLA ANALİZİ:
ALANYA TURİZM SEKTÖRÜ

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Bu çalışmanın amacı; sistem dinamiği yaklaşımının, yerel sektörler için önerilebilecek politikaların analizinde kullanılabilecek uygun bir araç olduğunu göstermektir. Yerel sektörler yerel halkın refahı için olduğu kadar, ülke ekonomisinin istikrarı için de çok önemlidir. Bu nedenle, yerel sektörlerin kalkınmasına katkıda bulunabilmek için amaca uygun ve uygulanabilir politikalar geliştirilmesi gerekmektedir. Fakat her hangi bir politika uygulamaya konmadan önce, alternatif politikaların uygunluk ve uygulanabilirliğini değerlendirebilmek için politika analizi yapmak gereklidir. Öncelikle, Yerel Sektör Dinamikleri ve Politikaları konusu incelenmiş ve özel olarak Alanya Turizm Sektörünün durumu araştırılmıştır. Ardından Politika Analizi basamakları doğrultusunda, Alanya Turizm Sektöründeki problemler detaylandırılmış ve problemin çözümü için fayda sağlayabilecek alternatif politikalar tanımlanmıştır. Alternatif politikaların değerlendirilebilmesi için Alanya Turizm Sektörü dinamikleri “Sistem

Dinamiği Yaklaşımı” ile modellenmiş ve bu model Stella 9.0.1 ortamında uygulanmıştır. Model tüm politika alternatifleri için simüle edilmiş ve her alternatifin politika getirileri öngörülmüştür. Son olarak her politikanın gösterdiği performans önceden belirlenmiş olan kriterler çerçevesinde değerlendirilmiş ve mevcut politikalardan daha üstün getirileri olan birleşik politikalar oluşturulmuştur.

Anahtar kelimeler: Yerel Sektörler, Politika Analizi, Alanya Turizm Sektörü, Sistem Dinamiği, Politika Değerlendirmesi.

To My Parents

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LIST OF ABBREVIATIONS

1.	AC	:	Average Cost Of A Tourist Per Night For Accomodation Facilities
2.	AEOF	:	Additive Effect Of
3.	AF	:	Accommodation Facilities
4.	AI	:	All İnclusive
5.	ALT	:	All Tourists
6.	AMP	:	Average Monthly Profit
7.	AO	:	Alanya/Other Tourism Centers
8.	AP	:	Average Accommodation Prices
9.	ATO	:	Alternative Tourism Opportunities
10.	CE	:	Closing Enterprises
11.	CEOF	:	Constant for Effect Of
12.	deby	:	Desired By
13.	depto	:	Dependency To
14.	DS	:	Average Duration Of Stay For A Tourist
15.	E	:	Employees'
16.	fby	:	Forced By
17.	for	:	For
18.	fr	:	From
19.	IOF	:	In-Out Flow Of
20.	IR	:	Irregular Type of
21.	ind	:	index
22.	int	:	Intended To Come
23.	MEOF	:	Multiplicative Effect Of

24.	N	:	Normal
25.	NAC	:	New Airport Construction Near Alanya
26.	nof	:	Number of
27.	Non	:	Non
28.	NRC	:	Monthly Non Recurring Costs of AI ST in the first year of establishing them
29.	OC	:	Other Daily Costs per Tourist
30.	of	:	Of
31.	on	:	On
32.	oos	:	Out Of Season
33.	PA	:	Publicity Activities
34.	PCI	:	Percentage Change In
35.	per	:	Per
36.	perof	:	Percentage Of
37.	PR	:	Average Profit From A Tourist Per Night
38.	QE	:	Qualified Employees
39.	qua	:	Quality
40.	sal	:	Dailiy Salaries per tourist
41.	SP	:	Average Seasonal Period
42.	ST	:	Standards
43.	STC	:	Extra Average Cost Of Each Tourist per "All-Inclusive Standart" per Day
44.	supdem	:	Supply/Demand
45.	TA	:	Travel Agencies
46.	TAI	:	Tourists For "All-Inclusive" Tourism
47.	TATO	:	Tourists For ATO
48.	TEO	:	Tourism Education Opprotunities
49.	TYINC	:	Total Yearly Income of AF
50.	UG	:	University Graduates
51.	Unv	:	University

52. w : With
53. wo : Without
54. wwo : With/Without

CHAPTER 1

INTRODUCTION

Local sectors involve a set of activities performed in a dynamic environment relating a group of people, living in a small region and are congregated to generate some specific product or service mostly using the local factors. Having identified the importance of them from the definition, it is easy to comprehend that outputs of each local sector contributes to the economic welfare of the region and nation, being the motor of development, or a reason for underdevelopment.

Therefore, it is a key requirement to enhance feasible and 'to the point' policies for the development of local sectors. However, analyzing local sectoral systems and policies for effectiveness and feasibility is a hard concept, both for the complexity of identification of local sectoral interactions and intricacy of mathematical equations modeling the sectoral dynamics.

The structure of a mathematical model is composed of a set of relations between model variables which are put into words of mathematics in the form of equations. The mathematical solution of a dynamic model, if obtainable, gives the exact Formula for dynamic behaviors of variables. But it is rarely possible for complex nonlinear systems. In such cases, dynamic behavior of a model can be obtained by simulation; which means "a step by

step operation of the model structure over compressed time" (Barlas, 2003, p. 1135).

Besides, policy analysis for a local sector requires 'systems perspective'. Local sectors are systems whose problems are mostly originated by their internal structure. 'system perspective' suggests the idea that a dynamic problem behavior is not completely caused by a single 'external enemy' or a manager. According to Barlas (2003), the cause lies on the whole structure and interactions within the system, being unable to defy disadvantageous external conditions.

Therefore, System Dynamics discipline would be a very appropriate tool to analyze local sectoral dynamics and policies, which has 'systems perspective' in the core of approach and enables mathematical projections of system variables' relations for simulation.

A tourism sector is specific to its local dynamics by its nature and "one of several development options open to a location" (Mill & Morrison, 1985, p. 221). Tourism development is a policy alternative particularly for developing contries (Mill & Morrison, 1985), and studying internal dynamics of local tourism sectors are primarily important. Therefore it is reasonable to choose Tourism Sector among others to make policy analysis using System Dynamics approach.

Specifically, Alanya Tourism Sector is chosen in this thesis to show how System Dynamics methodology can be employed to make policy analysis for local sectoral systems. Steps of policy analysis are supported by tools of System Dynamics and data from Alanya Tourism Sector.

In Chapter 2 Local Sectoral Dynamics and Policies are examined. In Chapter 3 Factors and Dynamics of Alanya Tourism Sector is studied with

available data from literature surveys and the problems of the sector are briefly evaluated. In Chapter 4, following the steps of policy analysis, ‘statement of the problem’ for Alanya Tourism Sector is revealed, evaluation criteria and measures for policies are established and alternative policies that would aid in solution of the problem are idenfined. Through Chapter 5, Dynamics of Alanya Tourism Sector is modeled by this System Dynamics methodology. Local variables affecting the sector are identified and implemented in sectoral ‘Influence Diagram’, then the diagram is converted into a ‘Formal Model’ which can be simulated in Stella 9.0.1. Source of parameters and initial values present in model equations is primarily the literature reviews and secondly the structured interviews if the related data could not be found from literature reviews. Lastly, Verification and Validation of the model via available tests for System Dynamics approach is exhibited. Finally in Chapter 6 the formal model is run with alternative policies. Forecasted policy outcomes via System Dynamics approach are evaluated using the previously established criteria and policies having more superior outcomes than the present ones are tried to be created.

CHAPTER 2

LOCAL SECTORAL DYNAMICS AND POLICIES

Before proceeding, it is convenient to display the meanings and the relations of the “key words” used in this work.

The word “local” has many meanings in dictionary (local - What is local?). The most appropriate ones for the existing content are:

- Characterized by or occupying a particular place.
- Local means existing in or belonging to the area where you live, or to the area that you are talking about.
- Of or belonging to or characteristic of a particular locality or neighborhood;
- In the classification, "local" refers to the level of government that has the authority for the delivery of services and is distinguished from "state ". Local government can be municipal, county, or parish.

As is seen, all definitions cite that “local” means a “place” in a “neighbourhood” of the “area” mentioned, and it is a “level” of government at the same time.

There are many geographical scales like “local”; community, regional, national, global… The key point here is to distinguish between their relative

meanings read from socio-economic processes evolving there. For example; local currency experimentation is local scaled issue, whereas trading regime liberalisation is a global scale process and house price enflation is a national one (Pike, Rodriguez-Pose, & Tomaney, 2006).

Secondly, 'Sector' means "a set of activities that are unified by some related product group for a given or emerging demand and that share some basic knowledge" (Malerba, 2004, p. 9). Sectoral systems are composed of the agents that performs market and non-market interactions for the creation, production and the sale of sectoral products (also the services). The agents are individuals and organizations at different levels, with specific competencies, organizational structure, objectives and behaviours. Interaction between them is carried through processes of communication, Exchange, cooperation, competition and command; and the interactions are shaped by institutions (Malerba, 2004).

Finally 'Policy' means (policy - What is policy?)

- course or method of action, guidelines;
- A policy is a set of ideas or plans that is used as a basis for making decisions, especially in politics, economics, or business.

The definition of "policy" will also bring the need of defining "policy analysis", which we will realize through the next chapters.

> Policy analysis means: The systematic investigation of alternative policy options and the assembly and integration of the evidence for and against ecah option. It involves a problem solving approach, the collection and interpretation of information, and some attempt to pedict the consequences of alternative courses of action (Patton & Sawicki, 1993, p. 22).

> Another definition of ‘Policy Analysis’ is: An applied discipline which uses multiple methods of inquiry and argument to produce and transfrom policy-relevant information that may be utitlized in political settings to resolve public problems (Patton & Sawicki, 1993, p. 23).

According to Malerba (2004), “sectoral system” approach has important contributions to policy making and policy analysis. Firstly, a sectoral system approah creates a new methodolgy for identification of the new challanges that a sectoral system will face and variables which will be the “policy targets”. Secondly, impact of “common local” policies may greatly differ from sector to sector, so the policies should be defined in sectoral boundaries. Thirdly, a careful comparative analysis of sectoral systems over time and across countries should company for the analysis of the effects of policies. Fourth, a sectoral system approach shows the links, feedbacks and all interdependencies among all related sectors, and their effects on the dynamic structure of the specific sector. Fifth, sectoral system approach makes the public actor be aware of being included in a sectoral system at different levels, because it directly intervenes the dynamics of the sector variables. Sixth, policies should consider the different geographical boundaries of a sectoral system. While many sectoral policies are addresses at the local or national level, the reason behind a specific policy must also reflect a global competetive perspective. In addition, diversity of sectoral systems gives the opportunity to use different and appropriate policy measures for different sectors.

Therefore, using sectoral system approach for policy analysis becomes a useful tool but this also raises the question that what should be the right geographical scale at which to intervene – the nation, the region, or the locality (Giguère, 2005).

2.1 Local Sectoral Systems

As also indicated above, the word “Sector” in this work is Used to characterize a group of activities and companies that are similar with respect to a particular industry, maturity, type, or rating.

Sectors are characterized by specific knowledge background, specific technologies used, specific production or service processes, demand for the production/service and a number of firms and non-firm organizations and institutions. As Malerba stated, “sectors differ greatly in several of these dimensions” (2004, p. 15)

However, Malerba (2004) states that, for a sectoral system, the most convenient “scale of boundary” is not national boundaries and often the boundaries are local; because sectoral specialization defines the specialization of the whole area.

However, Belussi (1999) reminds that “It is not sufficent, in identifying an instance of a ‘local system’, simply to make the trivial observation that some firms belonging to same sector are located in the same area, and assess the practical know-how to produce a particular product (whether tiles, clothes, chairs, or tourist services). A local production system can be defined only when one can observe historically its reproductive capability” (p.730).

‘Local’ sectoral systems surely have reproductive capability. According to Uphoff (n.d.), especially local level institutions are really important to make local resources ready for use and regulate them to maintain a long-term productive activity. Another point Uphoff supports is that, “Available resources can be put to their most efficient and sustainable use with

location- specific knowledge, which is best generated and interpreted locally" (p.2). He states that "what is 'local' has its own positive characteristics, providing a basis for collective action, for building consensus, for undertaking coordination and management responsibilities, for collecting, analysing and evaluating information, energised by a degree of interpersonal solidarity. This does not happen automatically, however: it requires leadership and also institutions at these local levels" (p.3).

Supporting these characteristics, Malerba (2004) identified main building blocks of a Sectoral System into 3 groups: Knowledge, Actors and Networks, and lastly Institutions. Every sector has a specific knowledge base, used to shape the "structure" and "outputs" of the sector. Every sector is composed of "agents"; which are organizations and individuals which interact, cooperate and/or compete through the processes of the sector and the sale of the product/service in market. Institutions shape the actions and interactions of the agents by norms, routines, rules laws, standards and so on.

2.2 Dynamics of Sectoral Systems

As explained above, sectors has 3 main building blocks; knowledge, actors and networks, which continiously change over time. Therefore one should pay attention to their dynamics and transformation. Dynamic structure of sectoral systems are originated from different characteristics of sectors and this transformation often brings "development" to the sector.

Malerba (2004) firstly outlines that links and interdependencies, and consequently sectoral boundaries are not fixed but change over time, thus triggers the growth and innovation in the sector. Secondly, sequences of complementaries also create dynamism in the system and generate

development potential. Thirdly, firms can be involved in an “innovative process” in which they interact with other firms as well as with non-firm organizations, such as universities, research centers, government agencies, financial institutions and so on .

Understanding the sectoral dynamics is very important. Sectors and ‘sectoral variables’ provide a key level of analysis for economists, policy analysts and policy makers. “Theories of economic geography need to help us understand how spatial patterns of production result from the forces of change that drive particular sectors. Theory must therefore be able to render visible the key dynamics of economic life, while at the same time elaborating how these dynamics map onto patterns of development.” (Murdoch, Marsden, & Banks, 2000, p.107). This is why characteristics of localities play an important role in explaning sectoral dynamics and analysis of sectoral system dynamics explains the reasons behind the economic performance of countries.

2.3 Local Sectoral Development

In the long run, main source of growth is the ability to create and adopt new ideas and assembling them to economic activites. Creation, adoptation and diffusion occur at different rates across sectors, and in different time periods.

International differences in growth rates, labor productivity, innovative performance and export are affected by the sectoral distribution of country level economic and technological activities (Malerba, 2004). Sectoral distribution of country level economic activities are composed of local sectoral economic activities.

Development is a geographical phenomenon. According to Pike, Rodriguez-Pose and Tomaney (2006), geography is a sum of economic, social, ecological, political and cultural processes; and their geographies create the ways how such processes evolve. That is to say, localities and regions are the explanatory factors in economic growth, not just exterior of its outcomes. Localities are socially constructed spatial scales in which such processes are realized. Any definition of development should recognise this integral role of space. As Mytelka and Farinelli (2000) told, industrialized countries' governments are aware of locational advantages (like; stable vertical relationships between users and producers, Horizontal collaboration between sectoral enterprises that creates 'collective efficiencies', positive externalities generated by agglomerations and the supporting role that political and social institutions and policies play) for (sectoral) development, since 1970's.

Distinctions in local and regional development can be defined according to what is meant by development, as in Table 1 which is identified by Pike, Rodriguez-Pose and Tomaney (2006, p.39). Given the complexity and the geographical unevenness of the social world, such distinctions may be a question of extent.

According to the existing viewpoint, economic measures like growth, wealth creation and jobs have historically been the prior measures to detect local and regional development. But this is a norrower focus. According to Storper(1997), sustained increases in employment, income and productivity means "development" for a locality or region. For Beer, Haughton and Maude (2003), development is a group of activities focused to improve the "well-being" of a region. But this dominant economic focus on development has became broader in the mid 1990's, also defining the social, ecological, political and cultural concerns into "development". Reduced social inequality, sustainable environment, recognised cultural diversity, quality of

life, social cohesion are all integrated in varying degrees within the definition of local and regional development (Pike, Rodriguez-Pose, & Tomaney, 2006).

Table 1 Dimensions and Distinctions of Development

Dimension	**Distinction**	
Approach	Absolute	Relative
Autonomy	Local, regional	National, supranational
Direction	Top-down	Bottom-up
Emphasis	Strong	Weak
Focus	Exogeneous	Indigenous
Institutional lead	State	Market
Inter-territorial relations	Competetive	Cooperative
Measures	'Hard'	'Soft'
Objects	People	Places
Rate	Fast	Slow
Scale	Large	Small
Spatial focus	Local	Regional
Sustainability	Strong	Weak

According to Pike, Rodriguez-Pose and Tomaney (2006), there exists a distinction of development between its quantitative and qualitative character. The quantitative dimensions of development addresses numeric mesures; how much a particular of something. Absolute or relative changes over specific time periods may be considered. But the qualititative dimension is related with the nature and character of the local and regional development; like social and ecological sustainability, the type and quality of jobs, the growth potential and sectors of new firms; that is to say, more subjective concerns.

The qualitative dimension gained much importance in recent years because of the potentially harmful effects of weak and unsustainable types of simply quantitative local and regional 'development'. IMF made a definition of 'high quality' economic growth:

> That is sustainable, brings lasting gains in employment and living standards and reduces poverty. High quality growth should promote greater equity and equality of opportunity. It should respect human freedom and protect the environment… Achieving high quality growth depends, therefore, not only on persuing sound economic policies, but also on implementing a broad range of social policies. (IMF 1995; cited in Cypher and Dietz, 2004, p.30)

According to Malerba (2004), the institutional and organizational elements driving local sectoral development are more important than the relative differences between sectors based on relative factor prices and quantities. The primary instrument of those institutional elements to drive the local sectoral development is policy making.

2.4 Local Sectoral Policies

As indicated above, for policy making and policy analysis, "sectoral system" approach has important contributions. "From a sectoral system perspective, the principal role of the policy maker is to facilitate the self-organization of the Sectoral Systems (of Innovation) within the relevant policy domain" (Malerba, 2004, p. 500).

> The powers and capacity for action of local government in social and cultural policy is usually widely acknowledged. In this sphere, it is a question of resources rather than a legal matter. Lack of resources

> means that in practice higher layers of government replace local government, through sectoral programmes or individual projects. In other cases action is taken by the private sector (without such action being integrated into a coherent urban programme) (Borja & Castells, 1997, p. 113).

Malerba (2004) states that a neccessary condition for public intervention is the presence of a “problem” that is not automatically solved by markets and firms. Substantial analytical abilities are needed to recognize these problems. Identifying the causes of a problem means identifying the deficiencies in the sectoral system’s functioning, which can be called as “system failures”. When the causes behind a problem are identified, this means the “system failure” is also identified. If policy makers do not know the character of the system failure, they can’t know whether to influence or change institutions or the links between them. Therefore, the analytical basis for the design of a “developing” policy should be supported with the identification of the problem with an analysis of its causes.

Institutional forms are the key elements in the capitalist economies’ dynamics. Similarities and differences between economic and political institutions has effects on economic behaviour and performances of sectors. Accoring to Uphoff (n.d), institutions such as local governments are important for “monitoring changes in resources' status can be quicker and less costly where local people are involved; making adaptive changes in resource use is speeded up where local decision making has become institutionalised” (p.2).

According to Giguère (2005), there are seven key policy principles for government and cities. Firstly, the urban hierarchy is stable but cities are more dynamic and can improve quickly. Secondly, as also stated above; cities lead to nations. Thirdly, successful cities form successful regions.

Fourth, cities mean sub-regions at the same time. Fifth, for local policy making, the goals and attitude of national and regional govervent matters. Sixth, for policy making in a city, the national policies also matter because the origin of the financial support is the national government. And finally, cities should help themselves to improve along the expectations from local governments.

2.5 Tourism Sector and Tourism Policies

As there are sectoral systems of production, so there are several sectors in services. Many of the sectoral features of production and services are common, but some have a prominent place. First, In services, products are closely related to processes in services.Second, embodied knowledge in equipment and in people are very important. Third, actors such as suppliers and users have a major role in services because interaction is very important in services. Fourth, institutions have a significant role in term of procedures and mechanisms regulated by formal regulations and standards. In services, Procedural change plays a primary role. Fifth services are less international than manufacturing, and realized in local scales. Sixth, services show continious change in time (Malerba, 2004).

Above features of sectors in services show great relevance with tourism sector. Tourism sector depends on processes, servicing people and quality in service is higly important, tourists have the major role in tourism, regulations and Standards are the mechanisms to control the sector, tourism is mostly a local sector and it shows dynamic behaviour in time. Therefore Tourism sector is an appropriate sector to be observed with “sectoral systems” approach in order to analyze local sectoral dynamics and policies.

2.5.1 Structure of Tourism Sector

As in all sectors, it is useful to make a grouping to identify the characteristics of tourism supply. When a grouping is made, it is easier to recognize the key factors showing their competitive status and other characteristics such as concentration, entry and exit conditions, profit levels, cost structures and capacity of the group.

Before grouping, defining 'tourism' and identifying the common characteristics of tourism enterprises may help.

Many definitions of tourism focuses on its economic implications.

> Tourism refers to the provision of transportation, accomodation, recreation, food, and related services for domestic and overseas travellers. It involves travel for all purposes, including recreation and business (Ansett Airlines of Australia 1977, cited in Williams, 2004, p. 27).

But tourism involves more than only business components; it has a qualitative aspect and hospitality concern. The following definition reflects these points:

> Tourism can be defined as the science, art and business of attracting and transporting visitors, accommodating them and *graciously* catering to their needs and wants (McIntosh 1977, cited in Williams, 2004, p. 27).

Öztaş (2002) summarized the common characteristics of tourism enterprises as; tourism enterprises are modern enterprises that unify

products and services to meet tourists' needs, organize and 'market' some economically unmeasurable touristic attractions (such as weather, sea, hospitality, cultural entities etc.) and depend mostly on qualified human resources.

As Sinclair and Stabler (1997) noted, grouping of tourism sector seems problematic, because sub-markets in tourism sectors differs in size; some are too broad and some are too narrow. But the general classification is divided into five; accomodation, transport, intermediaries, attractions and other services. The detailed grouping is shown in Table 2 (Sinclair & Stabler, 1997).

Table 2 Major Tourism Markets

Tourism Market	Types
Accommodation	Serviced
	Self-catering
Transport	Air
	Rail
	Road
	Coach
	Car hire
	Sea
Intermediaries	Travel agents
	Tour operators
Attractions	Natural
	Human made
Other services	Private
	Public

In this grouping, such categories as accomodation and transport are very broad and have a wide working range into sub-markets with different structures and operation modes. Nevertheless, there is always a considerable change in the structure of tourism supply in terms of firm numbers, their size and market share. On the other hand, institutional structures has an important role in economic analysis of tourism sector, who investigates the dynamic nature of tourism market in which there is high uncertainty in information availability. Therefore, in modeling tourism sector, it is neccessary to use a more *industrial economics-oriented* perspective in which only ***some*** characteristics and variables of tourism supply are percieved as important to its structure and operation and are related to the problematic parts of the sector.

2.5.2 Tourism's Role in Economic Development

Tourism development is a major policy alternative especially for developing countries because of its aid to economic growth. According to Mill and Morrison (1985), first reason for this is that developed countries have a growing demand for international travel. Second, the income elasticity of demand for international travel grows faster than the increase in incomes of developed countries. Finally, developing countries need more foreign Exchange to support their own economic development.

Tourism is important for the world's social and economic development, too. In 1999, tourism industry accounted for 10.66% of world's gross domestic product and for 8.06% of world's employment (WTTC, 2001; cited in Jacob, Tintoré, Aguiló, Bravo, & Mulet).

Tourism is an invisible export that differs from international trade in several ways (Mill & Morrison, 1985):

1. The “consumer” collects the product from the exporting country, thereby eliminating any freight costs fort he exporter, except in cases in which the airlines used are those of the tourist receiving country.

2. The demand for the pleasure segment of tourism is highly dependent on non-economic factors such as local disturbances, political troubles, and changes in the fashionability of resorts/countries created mostly by media coverage. At the same time international tourism is usually both price elastic and income elastic. Changes in either of these two variables normally result in a more-than-proportional change in pleasure travel.

3. By using spesific fiscal measures, the exporting (tourist receiving) country can manipulate Exchange rates so that those for tourists are higher or lower (normally the latter in order to attract a greater number of tourists) than those at other foreign trade markets. Also, tourists are permitted to buy in domestic markets at the prices prevailing for the local residents (the exceptions being the duty-free tourist shops operated in many Caribbean islands and elsewhere).

4. Tourism is a multifaceted industry that directly affects several sectors in the economy (such as hotels and other forms of accomodation, shops, restaurants, local transport firms, entertainment establishments, and handicraft producers) and indirectly affects many others (such as equipment manufacturers and utilities).

5. Tourism brings many more nonpecuniary benefits and costs (that is social and cultural) than other export industries.

As indicated above, tourism is an “invisible export” because of the characteristics of tourism sector. This means that tourism has economic impacts on the region other than the foreign exchange, such as the positive changes it caused on the income average, employment availabilities and socioeconomic situation in the region.

Performing a sustainable development is very important for tourism sector. Lane (1994) explained ‘sustainable tourism’ as the outcome of policies and methods that develops tourism in a destination area such that its environmental resources (natural, built and cultural features) are preserved for future development. As Owen, Witt, and Gammon (1993) stated, concept of sustainable development can be in line with economic growth unless it makes excessive demands on natural resources.

Mill and Morrison (1985) suggested three strategies in order to maximize economic impact of tourism within a region. The first one is the balanced growth strategy, in which tourism is seen as an important sector of a broad-based economy. In order to get the maximum economic profit, tourism supply in goods and services should be locally produced. There is also an unbalanced growth strategy that points out tourism is the spark to economic growth. Balanced growth supporters emphasize the development of supply, but the unbalanced growth proponents give importance to expand the demand. As long as the demand is created more and more through the tourism development, the related industries will see the need for their products and services and begin to provide them locally more and more. In the middle of these two strategies, coordinate growth strategy stands. In order to locate an economic effort on an area, it should either suggest a promising or existing base (balanced growth concept), or show incomplete structure and give recreational opportunities (unbalanced growth concept) (for example, creating a convention center to alter the seasonality problems). In any idea, it is seen that the key to the economic effect

maximization of tourism is maximizing the amount of revenue and jobs developed within a region. This means developing, marketing and organising the sector dynamics is needed in order to bring tourist money in.

Stability of growth is also a very important issue; in fact it is the key point that will turn any type of growth to 'development'. In general, in order to observe growth, "an initial position is compared with a subsequent outcome, for example, the levels of income and employment before and after a change in tourist spending" (Sinclair & Stabler, 1997, p. 148). Actually, the inceasing (or decreasing) patterns of growth and their future characteristics and effects should also be examined and planned.

2.5.3 Tourism Planning

Tourism sector is a dynamic and somehow "growing in quantity" environment. Against this dynamism, the tourism destination has two choices; be reactive to changes *after* they occur, or develop a plan to estimate the present situation, foreceast the future and select your action against it (Mill & Morrison, 1985). Although tourism planning is time-consuming and costly, it is an unavoidable neccessity in rapidly changing tourism sector dynamics. "Ideal models" for successful tourism in the world are those who have planned their tourism activities.

According to Hassan (2000), "Achieving the goals of sustainable development will require sophisticated planning and development strategies coupled with the involvement of all stakeholders, including public/private sector authorities, environmental groups, and local communities" (p.240).

Mill and Morrison (1985) note that the reason for tourism planning should prevent the negative physical, human, marketing, organizational and other

effects of ‘unplanned’ tourism practice. Tourism is a local activity created by the existance of unique attractions of the locality, and planning the tourism activities maintains it a ‘long-term’economic activity preserving the local attractive factors of the region, while utilizing them. Planning includes identifying alternative approaches to tourism activities, adopting to the unexpected economic, supply/demand, factor, sector conditions, maintaining the uniqueness of the destination, creating the desirable “tourism center” image both in supply and demand, and eliminating all other undesirable factors. (Detailed explanation of shortcomings in planning approaches to tourism development can be read from Tosun and Timothy’s work, in 2001).

Mill and Morrison (1985) identified five essential phases in the tourism planning process: background analysis phase, detailed reserach and analysis phase, synthesis phase, objective setting phase and strategy selection phase, and plan development phase. Crouch and Ritchie (1999) suggested trying to create ‘competitive advantages’ rather than ‘comparative advantages’ through tourism planning process.

2.5.4 Tourism Policies

Because transformation in tourism sector is continious, tourism policy making and planning should be a dynamic process. Policies are more broad-scale than tourism plans, so policies are valid for many years, but the lifespan of a tourism plan is normally not more than 5 years (Mill & Morrison, 1985).

Institutions and governments have a broad-range for tourism policy making. The natural and built environment may be improved, roads and airports may be built to ease the transportation of the tourists, investements in

natural resources, physical or human capital may take place, investments in tourism enterprices can be made or higher Standards of education and training may be given (Sinclair & Stabler, 1997).

> The policy recommendations that are critical to an integrated sustainable tourism development plan must aim to achieve the following goals:
>
> 1. to promote an awareness and understanding among key stakeholders (e.g., citizens, developers) of the critical link between any tourism development effort and sustaining the environment;
> 2. to promote equity in the development opportunities among local and international developers of quality tourism projects;
> 3. to maximize tourist satisfaction through the delivery of total quality experience;
> 4. to broaden the support from the host community through citizen/NGO involvement programs;
> 5. to develop and sustain the quality of life for the local communities;
> 6. to provide balance among economic, social, and environmental needs in all tourism planning and development programs;
> 7. to define the limitations to tourism development in terms of both physical and social carrying capacity of each destination;
> 8. to develop high-quality environmental impact assessments for both existing and proposed tourism developments;
> 9. to maintain the local culture and promote the image of its values, heritage, traditional way of life, indigenous behavior, and local sociopolitical fabric; and
> 10. to enhance the development of the human resource base in tourism through management education and training.
>
> (Hassan, 2000, p. 244)

In sum, it is neccessary to establish a tourism policy to guide the actions taken in the sector. Several needs of the region should be identified by the institutions and tourism goals should reflect the needs existing in the current market situation (Mill & Morrison, 1985). A model should be implemented showing the problematic issues on the market and generated policies should find a solution to existing problems, while considering the above recommendations as far as possible.

CHAPTER 3

FACTORS AND DYNAMICS OF ALANYA TOURISM SECTOR

As indicated in previous chapter, several needs of the region and the current situation of the market should be investigated in order to establish a policy to control and lead the actions taken in the tourism the sector. One must be able to identify the structure, elements and the problematic parts in the sector, before a model can be implemented and policy analysis can be done.

As Patton and Sawicki state, “locating the pieces and finding the way they match is a primary job of the analyst” (1993, p. 78) and it is more convenient to analyze the appropriate existing data roughly before carrying on a time consuming interview or launching a deep survey. In general, this basic data will lead the analyst to other sources of basic information and show the missing pieces of information that should be collected later by specialized interviews, questionnaires or researches.

One of the strategies to be used in gathering data is outlining the current situation, the characteristics of the problematic issues, listing the key individuals and organizations (Patton & Sawicki, 1993).

The blanks in such an outline become the first draft of the questions to be answered and also a better understanding of the problem and data needs. These data needs can be filled through a review of the literature, through analyses of statistical reports and agency documents and through observation and interviewing.

For the case of this work, **Alanya Tourism Sector** is chosen as the particular local sector to implement policy analysis. As it is suggested above, the “basic data” collected below will be used to outline the current situation and problematic issues of Alanya Tourism Sector. After the related model showing the sector dynamics is implemented, list of data needed will be finalized and the ones that could not be found in this set of data will be collected from structured interviews.

3.1 Geographical Position, Nature, Climate And Flora

3.1.1 Geographical Position

Alanya is settled the coasts of Mediterranean and it is covered by Taurus Mountains in the north. The city is administrative part of Antalya and is about 135 km far away from this province. Geographical coordinates of Alanya are 36°30'07" and 36°36'31" northern latitudes and 31°38'40" and 32°32'02" eastern longitudes. Alanya has a peninsula located in the south of the city and is enclosed by city walls which long is 6500 meters. Between the peninsula and Taurus Mountains, there are plains. The passage from Alanya to Anatolia is not easy because of harsh nature of the Taurus Mountains. Koçdovat Pass, Kuşyuvası, Yelköprü, Dim and Alara valleys can be considered as the possible and easiest transportation points to pass through Taurus Mountains to reach Anatolia. This situation affects the

marine tourism in the natural harbour at north of the peninsula, however, the harbour is used more efficiently nowadays (Alanya Chamber Of Commerce And Industry, 2008).

Alanya is one of the most important tourism centers of Turkey because of being located by the Mediterranean, having a coastline of 66 kilometers, natural beauties and historical places, together with living an 8 months long summer.

The population in the city center of Alanya increased to 91.713 in 2007 according to Address Based Population Register System (ADNKS). The total population of Alanya reaches 500.000 in tourism season.

3.1.2 Nature

Geographically, Alanya is in the southern part of Antalya Gulf. Northern part of Alanya is surrounded by Akçalı and Geyik mountains (which are parts of Taurus Mountains). There are many plateaus on these mountains, used for summer settlement. The coastal plain of Alanya widens to the east and reachs Obaçayı valley. On the lower parts of the mountains, there are plains extending along the coast. Streams in Alanya have irregular regimes. Alara Watercourse, Kargı Watercourse, Serapsu Watercourse, Oba Watercourse and Dim Watercourse are the most important streams in Alanya. Studies are carried out regarding Dim Dam.

3.1.3 Climate

Mediterranean climate factors can be observed in Alanya. It is warm and rainy in winter, hot and dry in summer. The climate factors, hours of

sunshine, favorable see water and air current from Taurus Mountain create a nice climate for tourism.

As we can calculate from the Table 3 below, the average temperature of all months' mean temperature is 19.32 degrees in Antalya. The temperature of the town is "suitable" for summer tourism beginning from April to the end of November (8 months), and "best" for summer tourism beginning from June to the end of September (4 months).

Table 3 Average Weather Statistics (1975-2006)

Months	Jan	Feb	Mar.	Apr.	May	June	July	Aug.	Sept	Oct	Nov	Dec
MeanTemp.	11.8	11.8	13.7	16.8	20.9	25.0	27.7	27.9	25.4	21.2	16.4	13.2
Mean Max.Temp.	16.2	16.3	18.1	21.0	24.6	28.5	31.4	31.9	30.2	26.6	21.5	17.7
Mean Min.Temp.	8.6	8.3	9.9	12.9	16.6	20.5	23.3	23.6	21.3	17.4	12.9	10.0
Max.Temp.	23.2	22.8	28.1	30.2	35.4	37.8	40.8	39.6	36.8	34.9	30.0	23.8
Min.Temp.	0.6	-2.2	1.0	4.0	9.8	13.3	17.3	14.1	14.9	10.0	3.0	0.4

Resource: http://www.meteor.gov.tr/veridegerlendirme/il-ve-ilceler-istatistik.aspx?m=ALANYA

3.1.4 Flora

The total surface area of Alanya is 175.678 hectares. Alanya flora harbors 65% moors and forests, 17% agricultural lands, 6% meadows and fields, 12% non-agricultural lands and residential areas (Alanya Chamber Of Commerce And Industry, 2008). Alanya has a very productive soil, thanks

to its climate and nature. Thus forests of Alanya are wide and various plant species are present both in nature and agricultural areas.

3.2 Touristic Places and Tourism Activities In Alanya

3.2.1 Historical Places

Alanya has 16 different historical places in total. 3 of them are the most important of all; Alanya Castle, Kızılkule and Ehmedek. The historical places are listed below:

1. Alanya Castle
2. Kizilkule(The Red Tower)
3. The Dockyard
4. The Gun House
5. Ehmedek
6. The Suleymaniye Mosque
7. Bedesten
8. The Minting House
9. The Small Mosque Of Akbeshe Sultan
10. The Andizli Mosque
11. The Tomb Of Sitti Zeynep
12. Hıdırellez Church
13. Sharapsa Inn
14. The Citadel of Alara
15. Alara Inn
16. Kargi Inn

Historical places of Alanya mostly reflect Seljukian culture and architecture. Other historical places reflects the Ottoman, Byzantine architecture. Most of them was built about 13th century (Alanya District, 2009).

3.2.2 Museums

There are 4 museums in Alanya in total: Museum of Archaeology, Museum of Ethnography, Museum of İçkale and Museum of Atatürk. Museum of Archeology has items from Bronze Age -especially civilizations from Urartu, Frig and Lidya- , Byzantine era and Ottoman, Islamic and Seljukian periods. Museum of Etnography has ethnographic works such as clothes and guns. Museum of İçkale is in the historical citadel, at the peak of the Alanya peninsula (Alanya District, 2009).

3.2.3 The Sea Caves

The Pirates Cave, Lovers Cave and Phosporus cave are the sea caves in Alanya, residing at south and west of Alanya Peninsula.

3.2.4 The Land Caves

The most important land caves in Alanya are; Damlataş, Hasbahçe, Kadı İni (Çatak) and Gavur İni (Dim) caves. Damlataş cave was formed in Paleozic age. This cave's air is beneficial for treatment of allergic asthma. Hasbahçe cave is four times larger than Damlataş and Kadı İni cave is three times larger than Damlataş. Dim cave is the second biggest cave known to the visitors (Alanya District, 2009).

3.2.5 Antique Cities

Antique cities are located in the west and east of Alanya. The residential area of these cities are either on seashore or on cliffs. Four important antique cities exist in Alanya; Olybrassus, Hamaxia, Syedra and Leartes. Olybrassus, situated in Taurus Mountains, reflects the Roman period and belongs to Roman period. Hamaxiatine reflects Roman and Byzantine period. History of Syedra dates back to 7^{th} century B.C. The city has cisterns, bath building, street, temple, theatre, acropolis, necropolis, agora, houses and city walls. Finally, Leartes includes observatory towers, Caracalla excedra, odeon or theatre, Zeus Megistos temple, Apollon temple, Caesar temple, agora, bath and necropolis; dated from Roman period (Alanya District, 2009).

3.2.6 Beaches

Alanya has long beaches (35 kilometres in total) among which there are 100 m wide, huge beaches. Damlatas, Cleopatra, Keykubat, Orange, Ulas, Incekum, Fugla, Mahmutlar, Konaklı beaches are most important beaches in Alanya. Most of the beaches are wide and have fine white sand. The water is clear and transparent. Next to the beaches, there are nice facilities for recreation and sports, restaurants and bars. Nearly all parts of the beaches are Blue Flag awarded in Alanya, proving the quality of the water being used for bathing and swimming and the connected beach facilities based on quality and security (Alanya Chamber Of Commerce And Industry, 2009).

3.2.7 Natural Beauties

Alanya has other natural beauties other than its perfect beaches. The Taurus Mountains hosts many valleys and plateaus, together with its pine and cedar trees. There are 3 major plateaus; Türbelinas Plateau, Söğüt Plateau and Dereköy Plateau; each having smaller plateaus in their regions.

Dim River and Oba River are the main rivers. All along the rivers, there are restaurants, barbecue areas and picnic areas. Rivers are famous for their trout fish (Alanya Chamber Of Commerce And Industry, 2009).

3.2.8 Cultural Events

Cultural activities are organized in Alanya such as Alanya Tourism and Art Festival and International Alanya Jazz Festival. These festivals are 2 or 3 days activities, attracting many tourists in the beginning and at the end of summer season.

Other than festivals, Alanya Municipality Culture Center (AKM) organizes cultural activities; like theatres, exhibitions, concerts and conferences, too. There have been 160 activity events taken place in the Culture Center and 67.903 persons visited AKM during in 2007. Most of them (31.21% of all) visited AKM in February, due to an interesting exhibition having the topic of Dardanelles, which was organized by Alanya Journalists League (Alanya Chamber Of Commerce And Industry, 2008).

Scientific events took place in Alanya, too; such as International Tourism Conference in 2006 and two National Gastronomy Symposiums in 2007 and 2008 (Alanya Chamber Of Commerce And Industry, 2008).

3.2.9 Sportive Events

Alanya hosts sportive events, too; and the most famous of all is 'International Triathlon' Racing, which has an important place in the world's classification. Other than this, several other sportive events such as International Swimming Marathon, International M.T.B Mountain Bike, National Beach Football, International Beach Volley, International Beach and Outdoor Handball, International and National Urban Ball (Sky Ball) take place in Alanya, in different periods through the year (Alanya Chamber Of Commerce And Industry, 2008).

3.3 Alanya Tourism Sector

Alanya had a closed economy until 1960's. After the construction of the highway from Antalya to Mersin, Alanya started to send agriculture products to other cities and countries (Alanya District, 2009).

The tourism investments in Alanya started after 1980s. Due to accelerated touristic activities, a rapid urbanization took place in Alanya. Alanya is one of the biggest tourism centers of Turkey and Mediterranean territory (Alanya Chamber Of Commerce And Industry, 2008).

3.3.1 Development of Tourism in Alanya

The first tourism activities in Alanya started in 1950's, with domestic tourists visiting Damlataş Cave for its curative weather, and German tourists. In 1982, east and west of Alanya were announced as tourism centers and this announcement accelerated the tourism investments in Alanya rapidly. Since then, Alanya became a 'city' of tourism, together with its touristic facilities, food and beverage, travel and entertainment enterprises (Alanya Chamber Of Commerce And Industry, 2008).

3.3.2 Number of Tourists Visiting

Number of foreign tourists coming to Antalya and Alanya, together with their shares in Turkey can be seen in Table 4. In 2007, the number of tourists coming to Alanya has reached the figure of 1510000 (Alanya Chamber Of Commerce And Industry, 2008).

Table 4 Share of Foreign Tourists coming to Alanya in Turkey and Antalya

Years	Number Of Tourist Visiting			Antalya's Share (%)	Alanya's Share (%)	
	Turkey	Antalya	Alanya		Turkey	Antalya
2002	12.921.981	4.747.328	1.029.350	36,73	7,96	21,68
2003	13.701.418	4.681.951	988.785	34,17	7,21	21.11
2004	17.202.996	6.047.168	1.133.616	35,15	6.58	18,74
2005	20.522.621	6.884.024	1.464.686	33,54	7,13	21,27
2006	19.275.948	6.011.183	1.357.554	31,18	7,04	22,58
2007	23.017.081	7.291.356	1.510.000	31,67	6,56	20,70

Resource: Ministry of Culture and Tourism, Antalya Province Culture and Tourism Directorate Statistics and Alanya District Governorship Alanya Economic and Social Structure, January Report is utilized.

3.3.3 Tourism Season

Most tourists come to Alanya between April and October (through 7 months) according to the Table 5 below. Visitings of tourists are intensified in the period between the months of June-September (4 months).

Table 5 Distribution of Foreign Visitors Coming to Antalya According to Months

Months	2004	2005	2006	2007
January	114. 112	140.464	111.475	105.584
February	157. 040	185.510	110.601	134.207
March	205. 552	316.767	207.248	225.024
April	383. 959	432.106	442.700	421.626
May	682. 088	835.073	650.287	801.861
June	687. 982	852.378	862.050	1.043.007
July	910. 457	1. 104. 557	1.030.174	1.213.745
August	945. 704	1. 008. 486	1.024.706	1.228.820
September	796. 520	893.191	763.347	1.082.107
October	739. 558	786. 434	540.353	662.198
November	289. 638	215.499	153.441	234.414
December	134. 558	113.559	114.801	138.763
Total	6. 047. 168	6. 884.024	6.011.183	7.291.356

Resource: Antalya Province Culture and Tourism Directorate 2007 Tourism Statistics

3.3.4 Alternative Tourism Possibilities in Alanya

What is meant by “alternative tourism” in this study is the whole of tourism attractions in Alanya as being the ‘alternative’s to ‘mass tourism’ in Alanya simply depending on All Inclusive type of lodging and sea-sun-sand

tourism. Alanya has many diverse tourism opportunities suitable for alternative tourism when efficiently used; like rich history, cultural values, caves, plateaus, rivers, canyons. It is a suitable tourism center for diving and safari activities, too. Alanya is an attraction for old-aged population in Europe, especially in retirement period. In recent years, the borough gained a new alternative tourism opportunity with Akdağ Skiing International sports activities, together with other sports events taking place in Alanya; like Triathlon, Swimming Marathon, Beach Volleyball, beach Handball, beach Football and Mountain Bike. Cruise Tourism during April-November period is important for Alanya, too. Yacht and maritime tourism are also expected to show improvement in the following years. Historical and archeological values of Alanya are attractions for tourists interested in cultural identities of tourism centers. (Alanya Chamber Of Commerce And Industry, 2008).

However, according to Alanya Tourist Profile Research in 2007, most of the tourists come to Alanya for summer vacation. As in Table 6, the percentage of alternative tourism visitors are low.

Table 6 Tourists' Reasons for Visiting Alanya

Reason for Coming	**Frequency**	**Ratio**
Summer Vacation	2024	87.4
Health	86	3.7
Business, Conference etc.	25	1.1
Sport	44	1.9
Culture	94	4.1
Other	43	1.9
Total	2316*	100.0

*Tourists chose more than one choice.

3.3.5 Overnight stay numbers and the bed capacity

Average stay durations of foreign tourists coming to Alanya increased to its top level (9,91) in 2006 and 2007, as in Table 7. Turkey average is 3,92 days (Alanya Chamber Of Commerce And Industry, 2008).

In 2001, total bed capacity in Alanya was 112.957 and this capacity increased to 154.199 beds in 2007, with a rate of 33,3%, although the same non-decreasing pattern cannot be observed in number of facilities (Alanya Chamber Of Commerce And Industry, 2008).

Table 7 Capacity, Foreign Tourists and Stay Durations in Alanya

Years	Facility	Total Beds	Foreign Tourist	Overnight Stay	Average Stay Period
2001	747	112. 957	866. 130	8. 540. 012	9,85
2002	768	122. 663	1. 029. 350	9. 844. 710	9,56
2003	722	127. 432	988. 785	9. 479. 480	9,58
2004	748	133. 361	1. 133. 616	11. 030. 084	9,73
2005	790	146. 302	1. 464. 686	13. 459. 784	9,18
2006	669	147. 303	1. 357. 554	13. 466. 205	9,91
2007	717	154.199	1. 510. 000	14. 978. 387	9,91

Resource: Alanya District Governorship, Alanya Economic and Social Structure, January 2008 Report is utilized.

3.3.6 Accommodation Enterprises

Accommodation facilities in Alanya are in two groups; the ones having certificates from the Ministry of Culture and Tourism and the ones having

certificates from the Municipality, as in Table 8 (Alanya Chamber Of Commerce And Industry, 2008).

Table 8 Accommodation facilities Providing Services in Alanya

	31.12.2005		**31.12.2006**		**31.12.2007**	
Classification	**Facility**	**Bed**	**Facility**	**Bed**	**Facility**	**Bed**
Tourism Operation Certificated	249	77. 131	248	80.167	353	103.486
Municipality Licensed	541	69. 171	421	67.136	364	50.713
Total	**790**	**146. 302**	**669**	**147.303**	**717**	**154.199**

Tourisim Certificated Establishings giving service In Alanya are mostly 3 or 4 starred hotels. Number of 5 starred hotels, 2 starred hotels and aparts are of second tier (Alanya Chamber Of Commerce And Industry, 2007). Municipality Certificated Establishings in Alanya are mostly hotels and apart hotels.

According to Alanya Tourist Profile Research in 2007 (Akdeniz Üniversitesi Alanya İşletme Fakültesi, TÜRSAB Alanya Bölgesel Yürütme Kurulu), the mostly preferred accommodation type and lodging method by tourists are hotels (92.7%), and All Inclusive's (92.3%), respectively.

Average establishing size (total bed capacity/total establishings) of Accomodation Facilities in Alanya is 222 in 2007. The number increases to 348 if only Tourisim Certificated Establishings are counted. Nevertheless, this number is very low comparing to other tourism centers in Alanya like Kundu (1482), Belek (635), Beldibi (635) and Manavgat (575) (Alanya Chamber Of Commerce And Industry, 2007).

3.3.7 Other Enterprises

218 A Group, 6 B Group and 8 C Group (232 in total) travel agents took place in Alanya, in 2007 (Alanya Chamber Of Commerce And Industry, 2008). According to Alanya Tourist Profile Research in 2007, most of the tourists organize their vacations via travel agencies (Akdeniz Üniversitesi Alanya İşletme Fakültesi, TÜRSAB Alanya Bölgesel Yürütme Kurulu, 2007); as it can be seen from Table 9.

Table 9 Vacation Organization Methods of Tourists

Vacation Organization Method	Frequency	Ratio
Tour Operater, Travel Agency	1822	88.3
Personel	241	11.7
Total	2063	100.0

Number of food and beverage Enterprises in Alanya, licensed to be active by Alanya Municipality is 988 in 2007. Restaurants, bars, discos, cafeterias, pizza salons, kebab salons, breakfast salons, patisseries and similar enterprises are included in this number. There are also 37 big and chain stores in Alanya. This number was 6 in 2002 (Alanya Chamber Of Commerce And Industry, 2008).

In Alanya, discos and bars are the main entertainment enterprises. Together with these facilities, Alanya has one of the biggest aquaparks in Turkey and Sealanya Dolphinpark which is the first sea-park of Turkey and Europe (started its activities partially in 2008) (Alanya Chamber Of Commerce And Industry, 2008).

3.3.8 Publicity

Tourism enterprisers in Alanya are organized in ALTAV. This institution participates in fairs taking place abroad, and informs foreigners about Alanya with printed materials (like Alanya Calendars, Brochures etc.). In 2007, 19 fairs are participated in 17 different countries including EMITT-Istanbul. ITB Berlin, MITT Russia tourism fairs are the important ones among these (Alanya Chamber Of Commerce And Industry, 2008). This number is 23 in 2009. (alanya.com.tr, 2009).

However, according to Table 10, originating from Alanya Tourist Profile Research in 2007 (Akdeniz Üniversitesi Alanya İşletme Fakültesi, TÜRSAB Alanya Bölgesel Yürütme Kurulu), fairs and festivals are not that efficient among other publicity activities for Alanya. Most of tourists access the information via internet, through travel agencies, friends' advice and by means of media (TV, radios, newspapers and magazines).

Table 10 Resources of Information about Alanya for Tourists

Information Resource	**Frequency**	**Ratio**
Internet	1035	33.6
Television	143	4.6
Radio	25	0.8
Newspaper, Magazine	110	3.6
Brochure, Catalogue etc.	341	11.1
Travel Agency	998	32.4
Billboard etc.	25	0.8
Friends' advice	329	10.7
Fair, Festival	16	0.5
Other	61	2.0
Total	3083 *	100.0

* Tourists chose more than one choice

3.3.9 Intercity Transportation

Alanya has highway, seaway and airway transportations. Alanya is 135 kilometers away from Antalya, using D-400 highway. Antalya Airport (which is 125 kilometers away from Alanya) provides air transportation to Alanya (Alanya Chamber Of Commerce And Industry, 2008). The disadvantage of Alanya is its relative farness to this airport with respect to other tourism centers in Antalya.

There is another airport located 35 kilometers away from Alanya; Gazipaşa Airport, whose physical investment has been mostly completed. Gazipaşa Airport is planned to serve tourists coming to Alanya, Gazipaşa and Anamur. It will bring obvious advantages to the regional tourism sector after its full completion (Alanya Chamber Of Commerce And Industry, 2008). According to project estimations, the first passenger planes will land on this airport before 2009 summer season, but probably it will be used efficiently just about 2010 summer.

Natural harbor of Alanya, makes it a convenient place for maritime transportation. The harbor is open to international maritime traffic. There are ferryboat cruises from Alanya to Turkish Republic of Norhern Cyprus every other day, and many ships stop by Alanya Harbor during their Mediterranean Tours. Number of transit passengers increases year by year (Alanya Chamber Of Commerce And Industry, 2008).

Acccording to Table 11, referenced from Alanya Tourist Profile Research in 2007 (Akdeniz Üniversitesi Alanya İşletme Fakültesi, TÜRSAB Alanya Bölgesel Yürütme Kurulu), 88.8 percent of tourists use airlines to reach Alanya. Secondly, the highway is prefered. Highway is generally preferred

by Turkish people with the biggest percentage. The least preferred transportation way is seaway.

Table 11 Nationality versus Transportation Type

	Transportation Type			
Nationality	**Airline**	**Highway**	**Seaway**	**Total**
German	560	14	10	584
Austrian	62	1		63
Dutch	319	9	4	332
English	58	4	1	63
Ukrainian	38	3		41
Turkish	93	165	5	263
Russian	258	10	1	269
Scandinavian	169	2		171
Others	293	2	2	297
Total	1850	210	23	2083

3.3.10 Tourism Education Opportunities

Various education opportunities are present in Alanya. Among all, Alanya Public Education Center organizes general purpose public courses (like foreign language, computer and reading/writing courses) and Meziyet Köseoğlu Vocational Training Center gives Apprenticeship Training courses (like hairdressing, electronical technologies and metal works) (Alanya Chamber Of Commerce And Industry, 2008). However the institutions that give education mostly related with tourism sector are Akdeniz University ALTSO Alanya Vocational School of Higher Education, Akdeniz University Alanya Faculty of Business Administration and ALTSO (Alanya Chamber Of Commerce And Industry).

Alanya Vocational School of Higher Education has two programs, Accounting and Tourism and Hotel Management; having the objective of training personnel who shall be employed at lower and middle levels of the establishments. Total number of students was 69 in 2007-2008 academic year (the first year of its educational activities) . Akdeniz University Alanya Faculty of Business Administration carries the mission of training personnel with qualifications appropriate for the changing global business world and at the management level required by the tourism sector with the high quality undergraduate education. The faculty accepted nearly 41 students each year between 2005-2007 (Alanya Chamber Of Commerce And Industry, 2008). Alanya Vocational School of Higher Education and Alanya Faculty of Business Administration are two major steps towards making Alanya a city of education.

ALTSO Educational Activities are another source of tourism education in Alanya. ALTSO conducts training programs, seminars, courses and certificate programs, cooperates with Universities for Internship Studies and assists Graduate/Postgraduate Thesis about Alanya (as in the case of this thesis study). ALTSO also pioneered the opening of Higher Education Institutions in Alanya and established ALTSO Continuous Education Center (Alanya Chamber Of Commerce And Industry, 2008).

In 2007, 1703 people attended the courses and trainings that ALTSO organized. 4326 people in total took the courses directed to Tourism Sector, between 2002 and 2008. In 2008, all of the courses were related with ‘Raising Quality in Tourism’ (Alanya Chamber Of Commerce And Industry, 2008).

Continuous Education Center plans and establishes training programs according to the needs from every segment of society who wants to have

new professional skills on current local economic activities (Alanya Chamber Of Commerce And Industry, 2008).

3.3.11 Tourist Profile in Alanya

Alanya Tourist Profile Research was carried out with the association of Alanya Faculty of Business Administration and Alanya TÜRSAB Regional Executive Board, in 2007. The aim of the research was bringing out the tourist profile coming to Alanya, their satisfaction from tourism activities and facilities, and providing additions for sustainable tourism in Alanya.

According to this research, 22.2 percent of foreign tourists coming to Alanya has annual income between $10001 - $20000 and 20.5 percent of them are in $50000 or above range (Akdeniz Üniversitesi Alanya İşletme Fakültesi, TÜRSAB Alanya Bölgesel Yürütme Kurulu, 2007). Distirbution of all ranges can be followed from Table 12.

Table 12 Annual Income Of Foreign Tourists

Income($)	Frequency	Ratio
0-1000	10	1.7
1001-2500	21	3.5
2501-5000	52	8.8
5001-10000	79	13.5
10001-20000	132	22.2
20001-30000	71	12.0
30001-40000	66	11.1
40001-50000	41	6.9
50001-above	122	20.5
Total	594	100.0

When the income of foreign tourists are evaluated according to their nations, using Table 13, the richest – $20000 or higher – tourists are German, Scandinavian and Dutch. Most of Russian tourists has lower income level than others.

Until 1990's, most of the foreign tourists coming to Alanya were the German citizens. In the following years, tourist profile has begun to change and foreign tourists coming from Russia, Holland and from Scandinavian countries have increased rapidly (Alanya Chamber Of Commerce And Industry, 2008).

Table 13 Nationality of Annual Income Of Foreign Tourists

Nationality	Income($)									
	0-1000	1001-2500	2501-5000	5001-10000	10001-20000	20001-30000	30001-40000	40001-50000	50001-above	Total
German		1		8	29	22	27	15	46	148
Austrian					3	6	4	1	2	16
Dutch		1	3	12	9	20	13	10	21	89
English					4	1	3		5	13
Ukrainian			10	4	2	1	3	1		21
Russian	10	14	31	40	38	8	3	4	4	152
Scandinavian		4	3	5	13	6	3	7	32	73
Others		1	5	10	34	7	10	3	12	82
Total	10	21	52	79	132	71	66	41	122	594

Turkish tourists' income mostly (73.5 percent of them) falls in $5001 - $30000 range. Only 11.9 percent of Turkish tourists have annual income that is 50000$ or higher (Akdeniz Üniversitesi Alanya İşletme Fakültesi,

TÜRSAB Alanya Bölgesel Yürütme Kurulu, 2007), as it can be seen from Table 14.

Table 14 Annual Income Of Turkish Tourists

Income($)	Frequency	Ratio
0-5000	5	3.1
5001-10000	35	22.0
10001-20000	53	33.3
20001-30000	29	18.2
30001-40000	3	1.9
40001-50000	15	9.4
50001-above	19	11.9
Total	159	100

According to Alanya Tourist Profile Research (Akdeniz Üniversitesi Alanya İşletme Fakültesi, TÜRSAB Alanya Bölgesel Yürütme Kurulu, 2007), reasons of tourists for choosing Alanya is generally ordered as climate, nature, cheapness, hospitality, historical places and night entertainment life in Alanya. They think safety, cleanliness and comfortableness of lodging facilities are better than their foods, services, animations and sport activities. Foreign tourists are pleased with airport transfers and reservation operations of travel agencies whereas Turkish tourists are interested in guidance services and well-treatment by the agencies. Generally, foreign tourists in Alanya spend money for textile in the first order, then shopping for food and beverage, travelling, jewellery, leather and carpet follows. For Turkish tourists, shopping for food and beverage is the first and textile is the second expense item. Tourists find entertainment, food, beverage and shopping expenses high, accommodation expenses normal and travelling

expenses partially low in Alanya. In this research, tourists stated their 'very high' level of satisfaction from Alanya vacation and their 'very high' probability of future recommendations to the people they know, about Alanya. The ratio of tourists willing to come to Alanya is 'high'.

3.4 General Evaluation Of Alanya Tourism

There number of the tourists coming to Alanya in 1999 and 2003 decreased when compared with the previous years. In 2005, there was a big increase in the total number of the foreign tourists coming to Turkey and it has reached the figure of 1.464.686 foreign tourists in Alanya. After a recession encountered in 2006, the total number of foreign tourists reached the figure of 1.510.000 in 2007 (Alanya Chamber Of Commerce And Industry, 2008). This situations shows that there are oscillations in number of the tourists coming to Alanya nearly every year.

For several years, the number of facilities in Alanya was more than 700. It reached the figure of 790 in 2005 but decreased to 669 in 2006. The reason for this is many apart hotels could not compete with big scaled facilities applying All Inclusive type of lodgings and closed. In 2007, number of facilities in Alanya increased above 700 again (Alanya Chamber Of Commerce And Industry, 2008).

'All Inclusive' system is one of the most important issues in Alanya Tourism Sector. The sector mostly depend on 'All Inclusive' type of tourism although it creates negative impacts on small scaled accommodation enterprises and on many tradesman.

Through the years, Alanya Tourism Sector has improved on the basis quantity, but quality in the service of tourism could not be achieved (Alanya

Chamber Of Commerce And Industry, 2008). Together with this, increased number of facilities, not having enough qualified personnel and fluctuations in tourism prevented the sectoral income to reach the desired levels.

Another problem of the sector is that many tourism facilities remain idle out-of-season. This situation should be prevented by lengthening the tourism seasonal period and creating sources of income for facilities throughout 12 months of the year.

There is high dependency of accomodation facilities to foreign travel agencies in the sector. Before the start of tourism season, accomodation facilities make marketing agreements with the travel agencies to increase the occupancy rates by price reductions. Thus, incomes of the accommodation facilities decrease and profit rates of overseas travel agents increase; which means major part of tourism income remains abroad (Alanya Chamber Of Commerce And Industry, 2008). Another reason for this dependency is the increasing competition between the tourism destinations in the Mediterranean territory.

Nevertheless, tourism Sector is still the most important and the most rapidly developing sector in Alanya. Sustainable development of tourism in Alanya would be possible by achieving environmental and facility based quality, realizing the alternative tourism potential of the locality, upgrading quality of the presented touristic products, creating advantages for tourists and carrying out enough publicity activities.

CHAPTER 4

POLICY ANALYSIS FOR ALANYA TOURISM SECTOR

From previous chapters, it is clearly illustrated that establishing a tourism policy is a must for the local and sectoral development. The specific tourism sector to implement policy analysis is Alanya Tourism Sector for this work.

There are many definitions of policy analysis.

> The systematic investigation of alternative policy options and the assembly and integration of the evidence for and against ecah option. It involves a problem solving approach, the collection and interpretation of information, and some attempt to pedict the consequences of alternative courses of action (Ukeles, 1977, p. 223).

> An applied discipline which uses multiple methods of inquiry and argument to produce and transfrom policy-relevant information that may be utitlized in political settings to resolve public problems (Dunn, 1981, p. 60).

But maybe the shortest and clearest definition of it is “the choice of the best policy among a set of alternatives with the aid of reason and evidence” (MacRae, 1979, p. 17).

Many policy analysis definitions generally confuse people’s mind; is ‘policy analysis’ a *process* through which alternative policies are evaluated or is it the *product* of the analytical process. This chapter is about the policy analysis *process* realized for Alanya Tourism Sector.

According to Patton & Sawicki (1993), policy analysis process is composed of 6 steps: Problem definition, determination of evaluation criteria, identification of alternative policies, evaluation of alternative policies, comparison of expected outcomes of policy alternatives and finally the monitoring of the selected (implemented) policy. These steps can be reviewed as long as new information; having the potential to modify the previous steps, arises in the current step. That is to say, policy analysis process is a feedback-structured process.

4.1 Definition and Details of the Problem

It is pointed out that problem definition is often the most crucial step in policy analysis. If the problem is not defined and verified clearly, analysts sometimes try to find “solutions to misspecified or nonproblems, generate right answers to wrong problem, or solve the right problem too late” (Patton & Sawicki, 1993, p. 151). Therefore the analyst’s mission is to identify the problem correctly and move from a general problem definition to a clear and objective problem statement. Defining the problems in such a way that they can be resolved is called “backward problem solving” (Polya, 1957).

The difficult thing in problem definition part is that the presence of a problem is known but generally can not be clearly identified, or the problem *was* there but during the policy analysis it disappeared or took a new dimension, or the objectives of the policy maker are not clear or in conflict. That is why most of the feedbacks and reviews are directed to the first step of policy analysis; "definition of the problem". As new information is fed and our previous assumptions change, the problem can be redefined again and again.

First step in problem definition is finding out the real sources of problem by asking: "who is concerned about the problem? Why? What are their stakes in the issue?" (Patton & Sawicki, 1993, p. 56). So that one can get closer to the problematic areas of the sector quicker. Afterwards the analyst should begin to collect data about these questions and see whether there is enough and appropriate information to carry on an analysis. Research about "Factors and Dynamics of Alanya Tourism Sector" is carried on for this reason, and placed in the previous chapter of this work.

According to Patton and Sawicki (1993), the challanges at this step is stating the problem of the sector meaningfully, eliminating irrelevant data, focusing on the central and critical elements of the sector. Only after this effort the existance of a problem that can be solved by the policy maker is clear. After the existance of the problem is clearly illustrated as in 'General Evaluation Of Alanya Tourism' section, next comes the 'statement of the problem'.

Originating from the "General Evaluation of Alanya Tourism" chapter and the interviews made with Alanya citizens belonging to different power groups of the sector, the "Problem Statement" of Alanya Tourism Sector is stated as:

There are ups and downs in number of tourists coming to Alanya each year. Although a peak of 1.510.000 foreign tourists came to Alanya in 2007, there is a decreasing trend in number of "elite" tourists (rather than a huge crowd of spending too little) coming since 2000's. Number of Accomodation Facilities (AF) in Alanya has oscillations, too; but the quantitative (bed) capacity in Alanya is continiously increasing with an increase rate of 50% since 2000's; sacrificing from the qualitative aspect of Alanya Tourism. In 2006, many apart hotels could not compete with All Inclusive" (AI) applications of big scaled facilities and closed. Surviving AF kept on applying AI "somehow", independent of their resources and capacity, utilizing the sea-sun-sand period being mostly obliged to it. Dependency of AF to Travel Agencies (TA) is inreasing who reserves their rooms with low prices. Tourists are spending less in food & beverage enterprises and shopping less from tradesman year by year. Besides, the percentage of closing enterprises out of season is very high in Alanya.All together, sustainable development for Alanya Tourism Sector could not be achieved.

4.2 Establishment of Evaluation Criteria

Criteria are established rules used to distinguish the effects of alternatives and select among them. In the next steps of policy analysis, we need criteria to to select the most appropriate one/s between them and measure achievement of any goal or objective.

Specifying evaluation criteria and deciding the dimensions along which the alternatives will be measured cause the analyst to clarify the values, goals, and objectives of the interested and affected parties and to make explicit both the desirable and undesirable outcomes (Patton & Sawicki, 1993). By stating the criteria in advance, we are setting up rules that have to be followed when comparing alternatives.

In establishment of the criteria process, being defined the problem previously; we firstly set our goals and objectives for the problem, which are abstract settings. Then we will try to find alternative ways to reach these goals and objectives. The analyzed impacts of the alternatives will be compared using criteria. Criteria should be made more specific and countable by measures. A measure should be "sufficiently precise that all persons using the procedure will achieve the same results" (Blalock, 1979, p. 12), which is more practical. Each criterion should have multiple related measures.

Therefore, setting goals and objectives against a "problem" is essential. According to our "definition of the problem", an appropriate "goal and objectives statement" might be as in the following:

Goal:

- *Increasing the sustainability of tourism sector in Alanya and making Alanya a competing tourism center both in quality and touristic variety.*

Objectives:

- *Reveal the touristic potential of Alanya other than sea-sun-sand tourism.*
- *Prolong the seasonal period in addition to summer.*
- *Improve the qualitative aspect of tourism in Alanya rather than quantitative aspect.*
- *Hold and improve the decreasing average monthly income of the the sectoral participants above some level.*

After setting our goal and objetives, the evaluation criteria should be established. Source of criteria is sometimes the policy maker (with some

redefining and modifying by the analyst) but more often the analyst deduces the criteria and later confirms them with the policy maker. In this work, evaluation criteria are established by the latter approach; they are inferred making literature review and working through the analysis.

Patton and Sawicki (1993) divided commonly employed evaluation criteria used in the literature into four main categories: Technical feasibility, political applicability, economic and financial possibility and administrative operability. Most major criteria fall into one one these broad categories and analysts should identify relevant criteria in each category. Technical feasibility criteria is related with whether the policy outputs will realize the objectives technically. Economic and financial possibility criteria is concerned with the cost and benefits of the policy. Political viability measure policy effects on different power groups and satisfaction/disaffection of the groups. Administrative operability criteria examines whether the desired policy could be implemented in the current administrative context. Principal criteria that fall under these 4 categories are shown in Table 15.

Specifically, criteria for tourism projects (originating from policies) can be divided into nine categories: Economic Contributions (to Income and Employment), Environmental Impacts, Social (Well-Being) Impacts, (Complementing) Competitiveness Impacts, Tourism (Potential) Impacts, (Project's) Developer and Operator Capabilities, Compliance with Policies, Plans and Programs, Equity (to inject into the venture) Contributions and (Economic) Feasibility. Typical tourism policy evaluation criteria reflect the tourism goals related with economic aspects of the tourism sector, consumers, environmental and natural resources or government operations (Mill & Morrison, 1985).

Table 15 Commonly Employed Evaluation Criteria

Criteria Category	Principle Criteria
Technical Feasibility	Effectiveness (On The Objectives) Adequacy (On The Objectives)
Economic And Financial Feasibility	Change In Net Worth Economic Efficiency Economic Feasibility Ratio Of Discounted Benefits To Discounted Costs Net Present Value Profitability Cost Effectiveness
Political Viability	Acceptability Appropriateness Responsiveness Legality Equity
Administrative Operability	Authority Institutional Commitment Capability Organizational Support

Among general categories of criteria listed above; Technical feasibility, Economic and Financial Feasibility and Political Viability categories of criteria can be carried out by System Dynamics. Administrative Operability category of criteria is out of scope for this work. Also holding the categories of criteria for tourism policies above in our mind, below is the list of established criteria whose measures can be revealed by System Dynamics approach and are considered to be “major” for a policy alternative for Alanya Tourism Sector:

- *Effectiveness*
- *Adequacy*

- *Change in net worth*
- *Acceptability*
- *(Time) responsiveness*
- *Equity*

Besides, if all costs and parameters related to the benefits of the alternatives could be valued through the policy period, all other “Economic and Financial Feasibility” type of criteria would be measured by System Dynamics Approach. Absolutely, valuing this costs and benefit parameters is an heavy and complex study that should be carried on a detailed research on the subject and out of the scope of this work.

After listing the evaluation criteria, we should also give the measures used to operationalize these criteria. As mentioned above, each criterion should have multiple measures. Measures will aid the analyst make comparisons over time and over alternatives, in order to conclude how well the alternatives performed to satisfy the established criteria (Patton & Sawicki, 1993).

Originating from their definition, effectiveness and adequacy (technical feasibility) shows whether and how much the policy had its intended effect. Therefore, measures of effectiveness and adequacy shoud reflect the extent the objectives are met. The following Table 16 lists the measures, shows the related objectives with each and gives the supportive statements inferred from Alanya Tourism Sector Literature Review showing that these measures can be used for the related objectives.

Table 16 Measures for Effectiveness and Adequacy

Measures for Effectiveness and Adequacy Criteria	Related objectives	Supportive Statements To UseThis Measure
AMP of AF	Hold and improve the decreasing average monthly income of the the sectoral participants above some level.	The mostly affected participants from the defined problems in Alanya Tourism Sector are AF, and they are good representatives of all sectoral participants in Alanya. Monthly income of sectoral participants will follow the increase in AMP of AF.
AF qua	Improve the qualitative aspect of tourism in Alanya rather than quantitative aspect.	It is the “AF Quality” that needs most improvement in the sector and Qualitative Aspect of Alanya Tourism will be mostly improved when AF quality has improved.
Depto TA	Reveal the touristic potential of Alanya other than sea-sun-sand tourism.	Decreasing Depto TA will show that real touristic potential of Alanya is revealed (by ATO).
Perof CE oos	Prolong the seasonal period in addition to summer	Decreasing percentage of closing enterprises out of season will show that seasonal period of Alanya is prolonged.

What to measure in criteria is as important as identifying major criteria. For example, nondeclining tourist numbers or tourist days(or nights), over a period of time, means sustainability for the tourism sector (Tisdell, 2001). We should try to observe sustainability from the evaluation criteria in order to mention about an advantageous, developing situtation. Therefore in this work, besides reading a single value of these measures in time, sustainability and “promising or not” states of the above measures will also be considered for the effectiveness and adequacy criteria.

The measures that will be used for the rest of evaluation criteria; Change in Net Worth, Acceptability, (Time) Responsiveness and Equity are listed in Table 17 below, together with supportive statements from the literature.

Table 17 Measures for Other Criteria

Criteria	Measures	Supportive Statements
Change in net worth	TYINC	As well as The gross regional product of an area can be used as a measure of flows of assets and liabilities to the area, TYINC can be used too. "Measuring changes in net worth is particularly appropriate for evaluating policies whose major impact will be on the economy of the region" (Patton & Sawicki, 1993, p. 212). Total Yearly Income of all sectoral participants will follow the increase in TYINC because AF are good representatives of all sectoral participants in Alanya.
Acceptability	Overshoots to the minimum in AMP of AF or nof AF	The main "power group" that contains many influential citizens of Alanya is AF owners. Any policy decreasing the number of them or AMP of AF will decrease the acceptability of the policy.
(Time) responsiveness	Speed of response of a policy on effectiveness measures	Not applicable.
Equity	Whether the policy gives all burden/windfall on certain groups or individuals	Not applicable.

Inbetween the above list of criteria, generally the "Change in net worth" is the dominant one. According to Patton and Sawicki (1993), the reason why

economics has gained such importance in policy analysis is that it provides measurable concepts to make an “hard” analysis. It is true that economics supply a tool to measure feasibility; in terms of costs and benefits of the policy and the budget constraints of the policy maker. However, the reason for policy making is not always ‘making profit’ in accordance with the budget. There are generally other (and maybe more) important criteria like equity and acceptability, as in the case of Alanya Tourism Sector.

4.3 Identification of Alternative Policies

By this step on, an understanding of goals and objectives of all involved groups in policy area should be stabilized. Knowing the current situation of the sector, being defined the problems of the sector and evaluation criteria for alternative policies, it is easier to generate alternatives. Generating the alternatives may show some aspects of the sectoral problem that could not be identified earlier so the problem may need re-definition in this step.

Before proceeding with searching possible alternatives, we should note that having “no action” for a system is also a policy alternative. Besides, it should be given special importance to analyze, to be able to compare and differentiate the results of action alternatives among themselves and with no-action alternative itself (Helling, Matichich, & Sawicki, 1982).

Patton and Sawicki (1993) support that a two step process may be useful for searching alternatives. Firstly, the analyst creates a range of possible alternatives. Secondly, after having identified the behavior of the system with no-action and action alternatives and observing the performance of the listed alternatives on evaluation criteria through the following steps; listed alternatives are combined, modified, altered and adapted to increase the superiority of them.

Appropriate combinations of alternatives are especially important, as just doing one thing means too little for a complex system (Sterman, 2002). This viewpoint is employed and this type of process is applied through this work.

A ‘good’ alternative creation depends on correct problem identification and relevant criteria selection. Generally the analyst moves back and forth between evaluating alternatives, designing alternatives and specifying criteria. This was also the case for this work.

As Patton and Sawicki (1993) pointed out, main methods of identifying alternatives are researched analysis and experimentation, no-action analysis, quick surveys, literature review, comparison of real world experiences, passive collecion and classification, development of topologies, analogy, metaphor, and synectics, brainstorming and comparison with ideal.

In this work, the alternative policies below are formed with the aid of literature reviews, passive collection, analogy, comparison with ideal and expert opinions.

4.3.1 No Action Alternative

The reason why a number of policies are sought for a system is that, the system in concern is belived to be performing worse day by day, loosing sustainability, or its promising aspects. Nevertheless, as it is also stated in previos sections, no-action is also a policy alternative. In order to observe the difference in the future situation of the system “with” and “without“ action alternatives; it is a neccessity to investigate the no-action conditions. As Patton and Sawicki (1993) stated, forecasted results of the no-action

alternative means establishing a benchmark that can be used to measure the effects of all other action-alternatives.

> Creating a useful baseline alternative is a compelling reason to develop a no-action analysis, but there are other reasons as well. First, potential budget reductions and budget reallocations call for careful analysisof the alternative of doing nothing. Trade-offs must be clear, since immediate savings may have to be exchanged for greater future costs if doing nothing is the alternative selected. Second, no-action analysis can help clarify Project objectives. Third, it can underline the need (or lack of need) for action. Fourth, no action analysis provides a framework for linking Project-specific planning to a comprehensive or strategic plan. Finally, accepting the possibility that no action could be the best solution acknowledges the difficulties inherent in problem definition, and the possibility that the problem does not have an optimal solution (Patton & Sawicki, 1993, p. 235).

4.3.2 Action Alternatives

- **NAC Policy**

In this policy alternative, the absence of an airport close to Alanya is discussed. The nearest airport to Alanya (Antalya Airport) reinforces TA to direct more tourists to other tourism centers in Antalya and fewer to Alanya, because of the additional TA cost of transferring tourists from Antalya Airport to Alanya. It is thought that constructing a new airport close to Alanya will encourage TA to bring more tourists to Alanya due to their increased profit with the aid of new airport.

- **Increasing ATO Policy**

This policy alternative deals with ATO in Alanya, that can be improved or newly created with the available touristic potential of Alanya. Less importance given to ATO makes Alanya dependent on the sea-sun-sand tourism, limits the tourism period to the seasonal period of Alanya, and many enterprises are left no choice but to close down out of season.

- **Constructing a Unv Policy**

This policy alternative offers constucting a university in Alanya. The expected effect on it is that it would decrease the percentage of closing enterprises out of season and contribute to the percentage of qualified employees working in Alanya Tourism Sector, which improves the quality aspect of the sector.

- **Increasing TEO Policy**

Reinforcing Tourism Education Opportunities (TEO) (other than universities) is an other policy alternative for Alanya Tourism Sector. It is expected that it would contribute to the percentage of qualified employees working in Alanya Tourism Sector, which improves the quality aspect of the sector, as in the case in Unv Policy.

- **Increasing PA Policy**

Increasing Publicity Activities (PA) is an other policy alternative for Alanya Tourism Sector. It is expected that it would increase the number of both type of tourists interested in sea-sun-sand tourism and alternative tourism.

- **Establishing AIST Policy**

This policy alternative offers establishing some AI standards for the Accomodation Facilities (AF) offering AI packets to tourists. AI type of accomodation is very common in Alanya; both for tourists and AF. But this situation brings the fact that every AF -sufficent in resources or not- moved to AI service, which decreases the quality of tourism in Alanya. This situation also causes increased competition between AF and dependency to TA. The expected effect of this policy is that it would increase the average AF quality, decrease the number of AF and also the competition between them.

4.4 Evaluating Alternative Policies

Alternative policies may be evaluated before they are implemented, or after they are implemented or both. Patton and Sawicki (1993) defined 'Before' evaluation as trying to predict if a potential policy will achieve it goals and 'after' evaluation as observing the policy output at the end. 'After' evaluation is looking backward, providing feedback to those involved in the earlier stages of policy analysis, and this feedback allows modifications to the policy itself for effectiveness. It also shows the undesired effects of a policy and monitors the return of the policy in terms of the funds spent to implement it.

'Before' evaluation is considered in this work; namely trying to predict the effects of a potential policy and examining its outcomes in terms of established criteria and set goals. Therefore, the principle activity here will be forecasting the policy impacts and then evaluating the technical, economic and political importance of those impacts. The first topic,

forecasting is highly dependent on the problem definition and selected criteria to evaluate.

Patton and Sawicki (1993) divided forecasting techniques into three; extrapolation, using theoretical models and intuitive prediction. Extrapolation is the simplest one, in which it is assumed that simple extension of what happened in the past will occur in the future. The method needs historical data. Theoretical model usage is the mostly encouraged method by the policy analysts to predict the outcomes of the alternative policies. Creating a model reflecting the behaviour of a system is needed. And intuitive prediction is mostly the judgements of experts to forecast the effects of a policy.

Intuitive prediction is not the issue of this work. Extrapolation will not be employed, too; as Tisdell (2001) warned that “past trends can not always be confidentally extrapolated. In order to understand whether tourism is likely to be sustained, the growth of tourism may need to be explained in terms of its wider context, using analysis and models” (p.101). **Therefore, developing a model reflecting the local sectoral dynamics of Alanya Tourism Sector will be our preference, too.**

Models are used in forecasting policy outcomes to evaluate the alternatives. Models are helpful because they move away from the weightless parts of a problem and “focus judgement” on the **key variables** (Quade, 1982, p. 144). Once modeling is done, the consequences of the action or no-action alternatives can be tested by running the model.

We can test our models by existing secondary data, or with data collected by the analyst, known as primary data. Seeking sources of data and information develops the simple models into detailed and practical ones.

Forecasting assumptions are tested by using control variables. Similarly policy makers change the values of control variables to achieve their objectives. Patton and Sawicki (1993) state that “Any model should portray the problem in a way that permits sound analysis and also leaves it open to change through policy” (p.269).

Sometimes the models are used essentially to calculate numerical answers, but generally the aim is to get theoretical explanation of behavior that supports our problem definition and policy analysis. **In this work, one of our goals is being able to explain the dynamic system behaviour, too. From this chapter on, the effort will be spent to develop a sufficent model of Alanya Tourism Sector, shedding light on the problematic parts of the sector and showing up the potential policy alternatives to solve those problems.**

After the model is implemented and it is used to forecast the outcomes of the policy alternatives, the technical and economic impacts of the policies will be evaluated. Then comes the “distinguishment of the alternatives” step, to compare and show the pro’s and con’s of each alternative. The last step of policy analysis, “monitoring the implemented policy” is out of the scope of this work.

CHAPTER 5

SYSTEM DYNAMICS APPROACH AS A POLICY ANALYSIS TOOL

There are many studies on sectors but most of them are concentrated on a single dimension of the sector. As Malerba also stated (2004), the probability of having an analysis of sectors investigating their working, structure and behavior, sector variables, sector dynamics and effects of the variables on economic performance of the sector is still very low. For performing such a work, System Dynamics is thought to be the most appropriate tool, being a relativist and holistic philosophy of scientific knowledge; as Barlas and Carpenter described it in 1990.

System Dynamics approach investigates dynamic policy problems of feedback nature systems. In each system, system variables interact and there are feedbacks between the managerial actions and system's reactions, which are the sources of systemic problems. System Dynamics approach aims to examine the causes behind a dynamic problem and can be applied in many areas; like national/regional/local/sectoral economic problems, sustainable development, politics, and many other areas.

The meaning of 'Dynamic' is "changing over time" and dynamic policy problems are typically feedback structured. There are managerial actions, results of the actions, evaluation of the action and reaction, yielding further

actions and new results. Feedback structure is not limited within managerial action and system reaction; also the various elements in the system has feedback loops. That is to say, “most dynamic problems are also *systemic* in nature” (Barlas, 2003, p. 1133). Dynamic systems are also non-linear and may be large-scale.

The complexities of dynamic systems mentioned above leads us first to develop formal models in order to understand the dynamic nature of a systemic problem and search for the policies to eliminate them.

Policy analysis is concerned about the behavior of the model to different policy parameters and/or policy structures (Barlas, 2003). In Policy analysis and design, one or more of the model characteristics are manipulated and the resulting behavior is examined. As Forrester (1971) stated, focusing on modeling *process* speeds learning and guides to better models, better policies and greater system improvements; more than focusing on the results of a particular model. Therefore, the whole modeling *process* will be given great care in this work.

We can define some steps to use Sytem Dynamics method for policy analysis. The first step is problem definition. Secondly, dynamic hypothesis is implemented on a Causal Loop Diagram (Influence Diagram). After this step, Causal Loop Diagram is converted into a formal model to be able to simulate the model. Mathematical formulations, various parameters and initial values should also be inserted into the formal model, which constitutes the next step. After verification and validation testings of the model, there comes the last step; implementing alternative policies into the formal model and displaying the performance of each policy against the dynamic problem.

5.1 Problem Identification For Alanya Tourism Sector

Modeling is a common tool used in examining soltions to problems. A model is a “a representation of selected aspects of a real system with respect to some specific problem(s)” (Barlas, 2003, p. 1134). That is to say, models of **selected aspects of systems** to study **specific problems** are built, instead of models of systems. The purpose behind a modeling should be a problem, and the model should selectively focus on “the problem related” variables (elements), factors and relations. Therefore problem identification is the major step since it affects all modeling and policy analysis efforts next.

The statement of the problem given in previous chapter is also invoked below:

There are ups and downs in number of tourists coming to Alanya each year. Although a peak of 1.510.000 foreign tourists came to Alanya in 2007, there is a decreasing trend in number of “elite” tourists (rather than a huge crowd of spending too little) coming since 2000’s. Number of Accomodation Facilities (AF) in Alanya has oscillations, too; but the quantitative (bed) capacity in Alanya is continiously increasing with an increase rate of 50% since 2000’s; sacrificing from the qualitative aspect of Alanya Tourism. In 2006, many apart hotels could not compete with All Inclusive” (AI) applications of big scaled facilities and closed. Surviving AF kept on applying AI “somehow”, independent of their resources and capacity, utilizing the sea-sun-sand period being mostly obliged to it. Dependency of AF to Travel Agencies (TA) is inreasing who reserves their rooms with low prices. Tourists are spending less in food & beverage enterprises and shopping less from tradesman year by year. Besides, the percentage of

closing enterprises out of season is very high in Alanya.All together, sustainable development for Alanya Tourism Sector could not be achieved.

This problem statement together with previously established objectives, criteria measures and policy alternatives will guide all the other steps that will follow.

5.2 Causal Loop Diagram Of Alanya Tourism Sector

Dynamic and feedback nature of policy problems has critical impotance in System Dynamics approach. Causal relations, circular causalities, identifying historical and structural (dynamic) causes of events and addressing internal structure of the system as the main cause of dynamic behaviour are essential to systemic feedback approach.

System Dynamics approach argues that most important events are caused by some accumulations over time, which are generally hidden in the internal structure of the system (Barlas, 2003). With short term evaluation, one can not get the structural causes of events and control the dynamic problem. As Forrester (1969) also indicated, in industrial dynamics, which he later referred as system dynamics, the primary objective is improving the understanding of systems' complexities. Therefore, the goal for this step should be constructing a hypothesis to understand system complexity and explaining the reasons of dynamic pattern in concern.

A causal loop diagram can be viewed as a "dynamic hypothesis" or a "conceptual model", that explains the causes behind the problematic dynamics (Barlas, 2003) The next step will be converting this "explanation" to a formal simulation model. Formation of a causal loop diagram has the following steps:

- Listing all variables having a potential role in the creation of the problematic dynamics of concern.
- Identification of the major causal effects and feedback loops between these variables.
- Construction of the an causal loop diagram deciding the model boundary and related assumptions.

5.2.1 Variables

The model structure and variables should represent those parts of the real structure that are hypothesized to be important according to the specific problem of concern. When Alanya Tourism Sector Dynamics are studied, the following 38 variables are seen having a potential role in the creation of the 'problem'. The variable names placed in Table 18 are formed by some abbreviations, whose meanings are given in 'List of Abbreviations' Section.

Table 18 Variables of Alanya Tourism Sector Model

1	AC	14	nof ATO	27	QE sal
2	AF qua	15	nof int TAI	28	QE supdem
3	AMP of AF	16	nof PA	29	SP w TA
4	AP	17	nof TAI	30	SP wo TA
5	AP deby AF	18	nof TATO	31	SP wwo TA
6	AP fby TA	19	Non QE sal	32	STC
7	depto TA	20	NRC	33	supdem for AF
8	DS	21	NRC per ST	34	TEO
9	E sal	22	OC	35	TYINC
10	NAC	23	perof CE oos	36	UG
11	nof AF	24	perof QE	37	Unv
12	nof AI ST	25	PR of AF	38	wwo TA ind
13	nof ALT	26	PR of TA fr AO		

5.2.2 Model Boundary

A dynamic problem is characterized by variables being dynamic, meaning “changing over time”. The dynamics of variables must be closely related with the operation of the internal structure of the system, because “dynamics” is essentially caused by it. It would not be a systemic problem if the undesired situation in concern is created by an external force (Barlas, 2003).

This situation brings the challange of major sources and interactions of the sources should be included in the internal structure of the model. “The model boundary must be wide enough so as to have an internal structure rich enough to provide an endogenous account of the dynamics of concern” (Barlas, 2003, p. 1141). On the other hand, the model boundary should be narrow enough to be controllable for policy analysis, excluding “out of the scope” variables and relations.

In this work, model boundary is defined by identifying the policy envelope. The aim of study is showing that System Dynamics can be used for analysis of Local Sectoral Policies, so the range of variables considered in this problem are “local sectoral” variables creating the problematic local sectoral dynamics. Factors originating mostly out of local sector dynamics, such as “existance of a global economic crisis”, “level of international competition between tourism centers”, “the rate of Exchange” etc are also out of boundary. If the dynamics of a problem were dictated by forces out of the system, there would be a few things to do for managerial control. But as we will see in next steps of our policy analysis, this is not the case for Alanya Tourism Sector.

Model boundary also helps to define the external input variables relating the system to its environment. In our model, major interactions are included in the internal structure such that the dynamics of problem is essentially driven by internal structure. But remembering the definition of policies (they represent rules for human control) the model should include some input variables to the system on which a policy maker (or any power group) has control to improve the System Dynamics. The majority of input variables in our model are the ones representing “policy alternative”s by their values as a function of time. These control variables are NAC, nof ATO, nof PA, nof AI ST, TEO and Unv, which are also shown underlined in Causal Loop Diagram of Alanya Tourism Sector below.

5.2.3 Assumptions

As Pike, Rodriguez-Pose and Tomaney (2006) stated, a model is an abstraction of reality reflecting the complex behavioral realtionships and dynamics in a system. A model can always deviate from reality by making some assumptions. Because of world’s complexity restrictive assumptions are always needed to seperate general sectoral patterns from particular detailed effects. Assumptions are also helpful to draw the boundary (and vice versa) where the problematic dynamics and the outcomes of the policy alternatives are expected to hold. The boundaries of the narrow domain can be expanded later, by systematically removing some of the assumptions.

Here are the assumptions made while drawing the causal Loop Diagram for Alanya Tourism Sector. Assumptions are originated from the “Factors and Dynamics of Alanya Tourism Sector” research reflected in Chapter-3 of this work:

- Average Duration Of Stay For A Tourist (DS) can be changed negligibly by local sectoral dynamics through a single policy period, therefore it can be modelled as a constant input variable.
- Number of tourist coming primarily for ATO and taking AI type of vacation are negligible. Number of tourists coming primarily for sea-sun-sand tourism (other than ATO) and taking non-AI type of vacation are negligible. Then, TATO and TAI are mutually exclusive sets, and nof ALT can be found adding the two: nof TATO and nof TAI.
- Initially, nof TATO using TA and nof TAI not using TA to organize their holidays are negligible. This situation may change according to the future dynamics of the system.

5.2.4 Causal Relations

The “structure of a system” is defined as “the totality of the relationships that exist between system variables” (Barlas, 2003, p. 1139). Thus, causal links and loops existing between system variables form the structure. The interaction of the loops is the main source of change in the system. Behaviour of any system is caused by its structure, namely causal relations.

A causal relation can be showed by $y=f(x)$ meaning that if the input variable x has changed, some degree of change in the output variable y is expected. In System Dynamics models, each causal relation is formed “other things being equal”. There are many causal relations between different variables in the system. An expected increase in a variable may not come true because of different influences from many variables on it.

A positive causality (influence) means *other things being equal*, “a change in x causes y to change in the same direction” and showed by a ‘+’ sign on

the causality arrow. a negative causality means “a change in x causes y to change in the opposite direction” and showed by a negative sign.

“A feedback loop is a succession of cause-effect relations that start and end with the same variable” (Barlas, 2003, p. 1147). This circular causality is meaningful dynamically over time. The sign of a loop is the algebraic product of all signs aroudn the loop. If the resulting sign is + the loop is positive or “reinforcing”. If the resulting sign is - , the loop is negative or “balancing” or “goalseeking”. Positive and negative loops in interaction are combined in Causal Loop Diagrams.

Two feedback structured causal relations for Alanya Tourism Sector is shown in Figure 1 below, the first being a reinforcing one, second being a goal-seeking one.

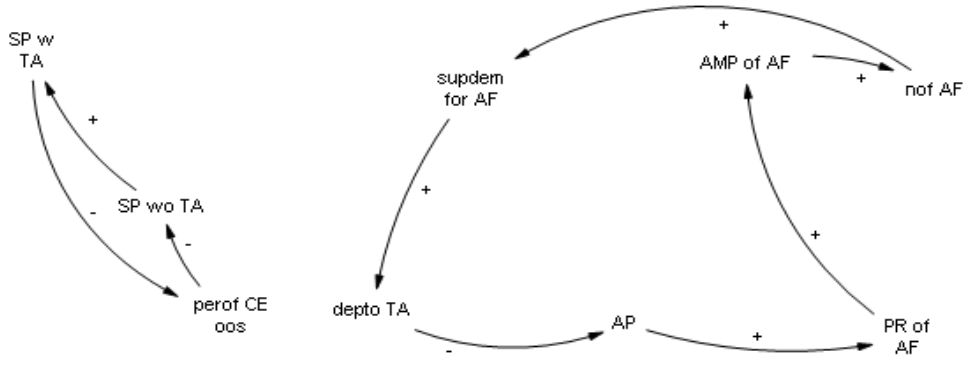

Figure 1 Two Feedback Structures from Alanya Tourism Sector Model

In this way, after determining the related variables and causal relations (originating from the ‘Factors and Dynamics of Alanya Tourism Sector’

research reflected in Chapter-3 of this work), defining the model boundary and making the neccessary assumptions the Causal Loop Diagram for problematic parts of Alanya Tourism Sector is formed, as in Figure 2.

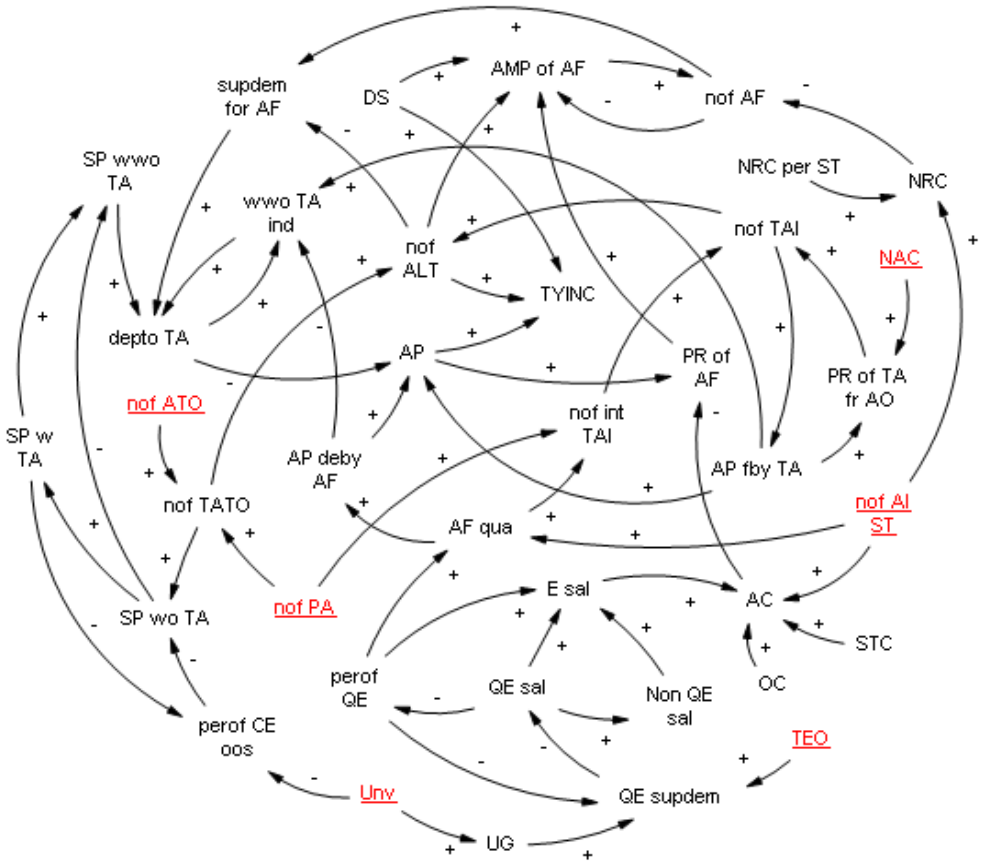

Figure 2 Causal Loop Diagram of Alanya Tourism Sector

5.3 Formal Model Construction

After forming the Causal Loop Diagram, the following step is the *formal model* construction, to be able to analyze it dynamically by computer

simulation. The model is operated over simulated time with a carefully designed set of experiments (simulation runs), so that the dynamics of the system, changes in values of variables, causes of the problematic parts and how they can be improved becomes clearer.

In System Dynamics approach, simulation experiments are often the only appliable scientific method of analysis; because mathematical analysis and experimenting in the real system are generally impossible, too costly or too time consuming with the available tools in hand. **The simulation tool that we will use for implementing the formal model is STELLA 9.1 in this study.**

5.3.1 Stocks, Flows and Auxiliary Variables

Constructing a formal model is mainly the identification of the stocks, flows and auxiliary variables within the Causal Loop Diagram, and implementing the Causal Loop Diagram into the formal model in appropriate manner.

Stocks are accumulations over time. They are also called the “states” of the system. The standart shape for a stock is a rectangle. If a model has n stocks, this means the model is of order n. Because stocks are historically accumulated values, thay cannot be changed easily.

Flows directly flow in and out of the stocks so that they can change the values of stocks. They are also called the “rate of change” of stocks. The standard shape for a flow is an arrow showing the direction of the flow and a valve.

The cloud symbol near a “flow” symbol means that a potential stock in the place of that cloud is outside the model boundary, so we do not need to track it.

A standart stock equation is a basic conservation equation over time, using the in-flows and out-flows. But For a model to be solvable by simulation, the influencing variables of flows must be specified, too. These intermediate variables are called the auxiliary or converter variables.

Stocks are always ‘there’ even if there is no time and motion; they have a countable value in every moment in time. But flows become meaningless without a ‘time period’ given, because their units are in the form of “liras/year, people/day, items/month”. This is how stocks and flows can be identified. But not every variable identified as a stock is implemented as a stock in the formal model; some are modeled as auxiliary variables. Especially important accumulations according to the dynamic problem definition should be modeled as stocks, and others should be auxiliary variables, because every extra stock means deciding to model its flow variables, too, which adds to the complexity of the model (Barlas , 2003).

Variables that are identified as stocks and flows are listed in Table 19 below. The most important accumulations according to the dynamic problem definition are modeled as stocks. All stocks are modeled together with their bi-flows, due to the fact that the effect of an auxiliary on a stock may both increase or decrease the level of the stock (working as an inflow or an outflow) according to circumstances in our ‘model’. All variables other than stocks and their bi-flows are modeled as auxiliaries.

Table 19 Stocks and Bi-flows in Alanya Tourism Sector Model

Stocks	Bi-flows
AF_qua(t)	IOF_AF_qua
AP_fby_TA(t)	IOF_AP_fby_TA
depto_TA(t)	IOF_depto_TA
nof_AF(t)	IOF_nof_AF
perof_CE_oos(t)	IOF_perof_CE_oos
perof_QE(t)	IOF_perof_QE

According to this distinction of stocks, bi-flows and auxiliaries, the formal model drawn for problematic parts of Alanya Tourism Sector can be examined in Figure 3.

5.3.2 Formal Model Settings

The outputs of simulation runs in the formal model will help us making model analysis. In our model, 'Length of simulation' for all alternatives is chosen as **13 years** in simulation runs. This is because, many of available secondary data belong to 'the end of year 2007' in our model, and policy outcomes are claimed to be observed till the end of 2020. Table 20 shows correspondence of simulation time with real time, in terms of years.

Table 20 Simulation Time vs Real Time

Sim. time	0	1	2	3	4	5	6	7	8	9	10	11	12	final
means the **beginning** of year	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021

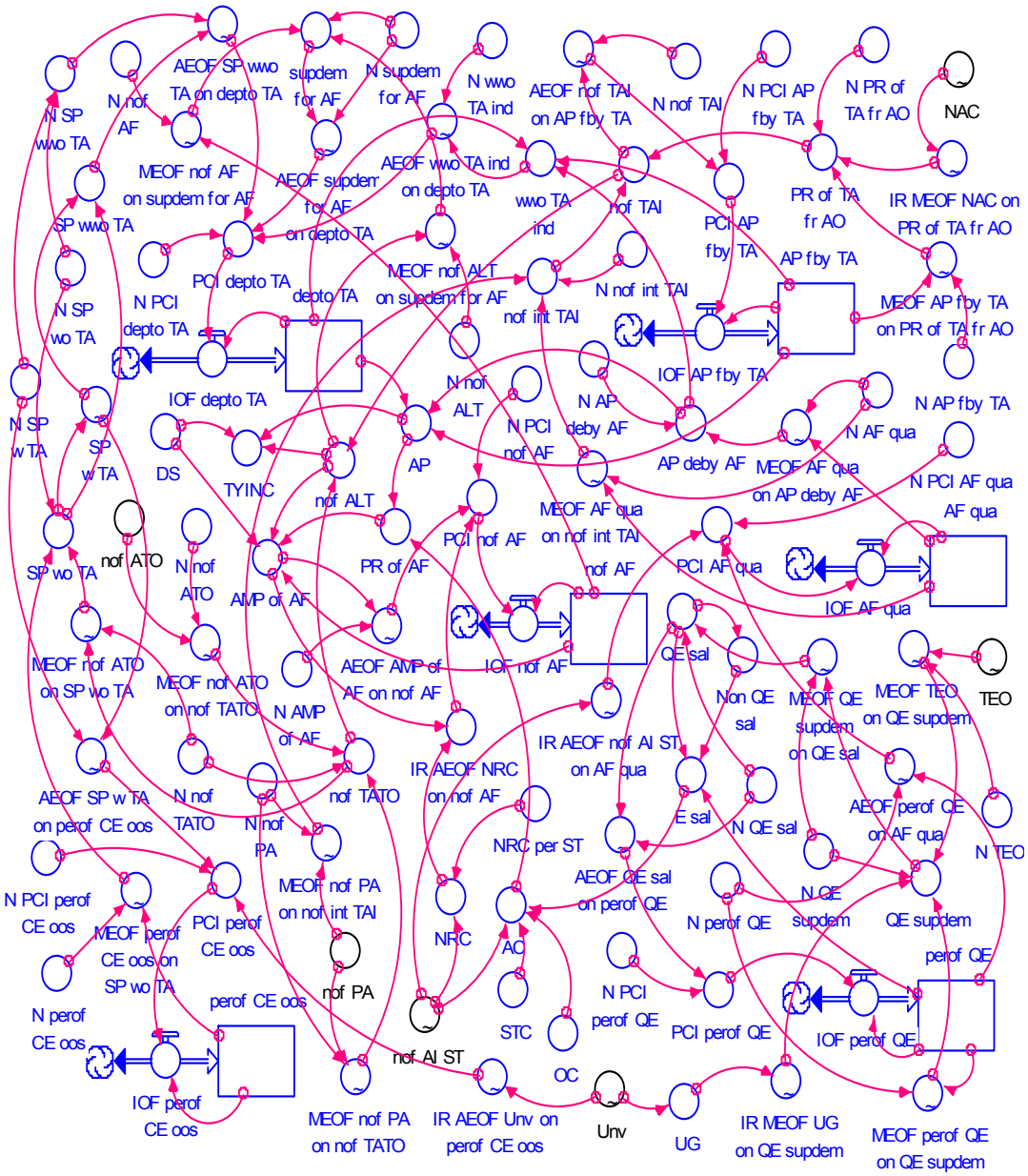

Figure 3 Formal Model of Alanya Tourism Sector

For all action alternatives, policy activities started no earlier than 2009. Thus, data for 2009 are created implicitly within no-action conditions for all alternatives, and the effects of policies are observed in this context. Therefore, the real policy observation period for this model is **11 years.** This time horizon is normal in length for lifespan of a tourism policy, as stated in Chapter 2. As they will be shown in the following sections, sustainability and promising effects of several policies are generally observed towards the end of simulation period.

As it can be guessed, basic time unit of the problem is **1 year** in the problem. The choice of time unit provides the denominator for all flow units in the model. For example, for the bi-flow increasing/decreasing AF, the unit-of-measure is AF/year. This time unit is also consistent with tourism sector statistics, which are generally collected yearwise.

Choice of **dt** is important for a formal model, too. dt is the interval of time between consecutive calculations in a model simulation. Value of any element in a model can not change in a unit of time smaller than dt. As dt gets smaller, changes get smoother patterns and become more precise numerically. However, “dt gets smaller” means “more calculations are neccessary” and it will take longer to complete a run. This trade-off is taken into account choosing dt.

As an appropriate value, **dt** is set to **0.125** for our model. Noting that dt is expressed in the time unit chosen for our model (1 year = 12 months); dt is **1,5 months**, in other words. Therefore, our model calculates new values every 1,5 months and any change in the model dynamics are differentiated once every 1,5 months.

Other than the trade-off mentioned above, choice of 1,5 months (0.125 year) depends on two reasons. Firstly, the range of values for dt which is

suggested by Stella Help document is from 0.0625 to 1.0 , which yields acceptable results (both smoothness and precision-wise) always. Dt's of $(1/2)^n$ are encouraged in this range. Secondly, month-wise or season-wise differentiations are meaningful for changes in tourism sector. 0.125 means 1,5 months (half a season), and it is equal to $(1/2)^3$; as suggested by Stella Help document.

5.4 Mathematical Formulations

After identifying stocks, flows, auxiliary variables and drawing the relational arrows between them by the help of Causal Loop Diagram relations, the next step is representing those mathematical links between model elements. Every arrow in the model means that, the element from which the tail of the arrow comes is used to calculate the value of the element to which the tip of the arrow reaches. Therefore, the value of each element in a model is equal to a function, whose inputs are those variables which are related with the element by arrows.

In a dynamic model, non-linearity is generally a natural rule, because of the several closed structured feedback loops in the system. As Barlas also stated (2003), this is why it is rarely possible to solve the set of equations written analytically and simulation is used to observe the dynamic behavior of the system.

In simulation, after writing this many equations for each element in the model and the model is run, the model operates over these equations through the simulated time step by step and dynamics of the model variables are gradually calculated.

As indicated before, a standart **stock** equation is a basic conservation equation over time, using the in-flows and out-flows. A general stock equation can be written as:

Stock(t) = Stock (0) +∫ (inflows-otflows) dt, Stock (0) is given.

In numerical simulation, the same equation is approximately represented as:

Stock(t) = Stock(t – dt) + (inflows-otflows) * dt, for t = dt, 2dt, 3dt...

An example from our formal model is:

nof_AF(t) = nof_AF(t - dt) + (IOF_nof_AF) * dt
INIT nof_AF = 717

As seen above, the neccessary data for a stock equation is the **initial value** of the stock.

Generally, the value of a **flow** is equated to some fraction of the stock into or out of which the flow is running, as in the following:

Flow = Stock * Fraction

This ‘fraction’ means the ‘percentage change in (PCI) the stock per unit time caused by the variables affecting on it ‘.

One example from our model is:

IOF_nof_AF = nof_AF * **PCI**_nof_AF

This fraction (**PCI**) is calculated by using the 'mathematical values of additive or multiplicative effects of other variables' on the flow, added or multiplied with the 'normal value' of the fraction. The example below shows an **Additive Effect Formulation** from the model, using **Additive Effect Functions (AEOF's):**

PCI_nof_AF = **N_PCI**_nof_AF + **AEOF**_AMP_of_AF_on_nof_AF + **AEOF**_NRC_on_nof_AF

As seen above, the first neccesary data for calculating a flow fraction is the **Normal Flow Fraction (N_PCI)**. The meaning of a 'normal' value is, "when all affacting variables are at their normal values in the model, we expect the related variable be at its own 'normal value".

In our model, all flows are modeled as **'bi-flows'** because, for all stocks of our model, when the variables affecting the related flow are performing 'better than their normal value' in total, the related flow turns to an 'inflow'. When they are performing 'no better than their normal value' in total, it turns to an 'outflow'. No other inflow or outflow are defined for a stock except those bi-flows. In fact, bi-flow formulations should always be implemented with additive effect formulations, and it is so in our model.

Some additive effect functions from our formal model are shown in Figure 4 and Figure 5. We should note that additive effects has units of '1/time'. Additive effect functions should have f(1)=0. This property is a must for the addition of the effects return Normal Flow Fraction when all affecting variables are at their normal values.

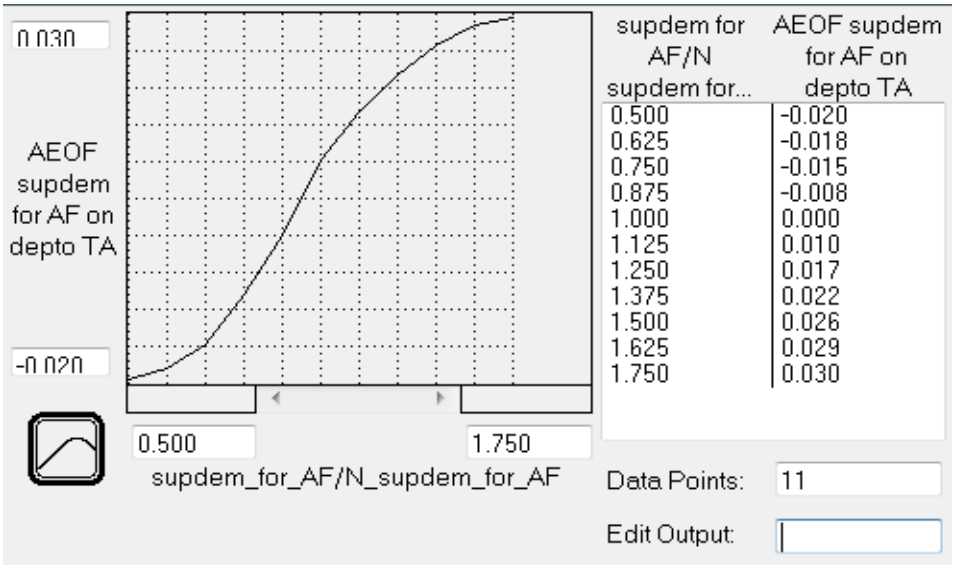

Figure 4 Direct Proportional Additive Effect Function

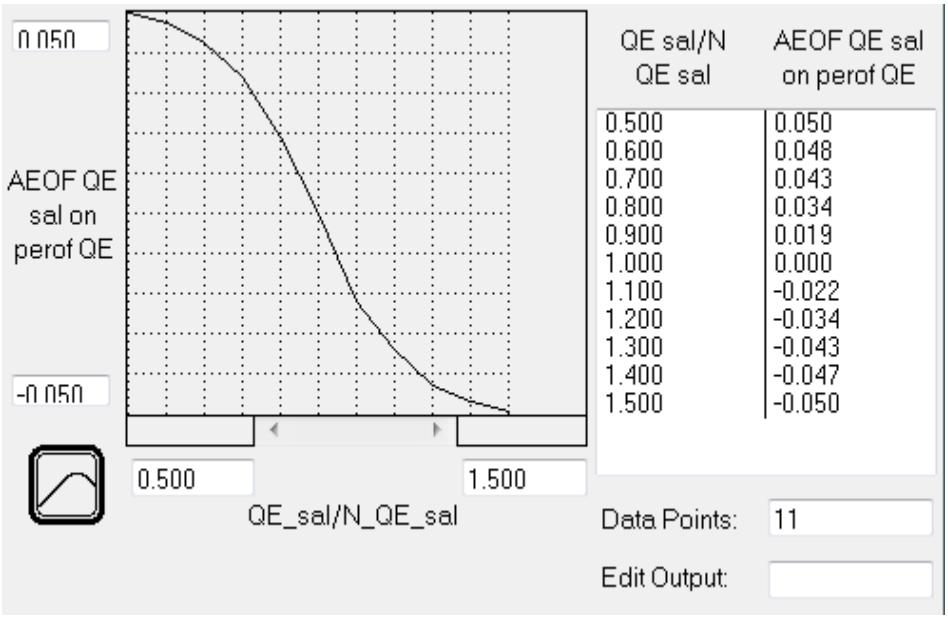

Figure 5 Inverse Proportional Additive Effect Function

As also seen from the Figure 4 and Figure 5, additive effects have positive and negative values, namely below or above 0. In the flow case, they add to or subtract from a normal flow fraction. From the view point of 'bi-flows', if one had tried to multiply two negative effects on a bi-flow, s/he would get an positive effect in total, which will cause the bi-flow work as an inflow; which is wrong. Here this is why bi-flow formulations are impossible with multiplicative effects and should always be implemented with additive effect formulations.

Modeling a stock is typical, and a modeling a flow is generally methodic, but formulating an **auxiliary** variable can be in various forms. Sometimes the value of an auxiliary is a direct calculation of other variables affecting it. One example from our model is:

nof_ALT = nof_TATO+nof_TAI

Barlas (2003) points out that equations of each auxiliary (and all other equations in a model) should have real life meanings and be dimensionally consistent. Here is an example from our "Alanya Tourism Sector" model:

AMP_of_AF = (nof_ALT/nof_AF)*(PR_of_AF*DS)/12

Being obvious, the average monthly profit of an accomodation facility depends on the number of tourists coming to the region each year, number of all facilities working in the region, the amount of profit obtained from each tourist per day and the duration of stay of each tourist. When this accumulated profit during the year is divided by 12, one gets AMP_of_AF.

Consistency of the dimensions is also established. The unit of nof_ALT is "Tourists". Unit of Nof_AF is "AF". The unit of PR_of_AF is "Euro's/Tourists/Days". DS is measured in "Days" and dividing by 12 brings

the unit of “Months” into the equation. Implementing these units into the equation brings the unit of AMP_of_AF:

Euro’s/AF/Months = (Tourists / AF)*((Euro’s/Tourists/Days) * Days) / Months

Sometimes, instead of direct calculations, the value of an auxiliary is again calculated by using the ‘mathematical values of additive or multiplicative effects of other variables’ on the auxiliary, added or multiplied with the ‘normal’ value of the auxiliary. The example below shows a **Multiplicative Effect Formulation** for an auxiliary.

nof_TATO = **N**_nof_TATO * **MEOF**_nof_ATO_on_nof_TATO * **MEOF**_nof_PA_on_nof_TATO

As seen above, the first neccesary data for calculating an auxiliary is the **Normal Value Of The Auxiliary (N)**. Also the ‘mathematical values of multiplicative effects of other variables’ on the auxiliary should be estimated with **Multiplicative Effect Functions (MEOF’s).**

Some multiplicative effect functions from our formal model are shown in Figure 6 and Figure 7 below. We should note that multiplicative effects are dimensionless, namely they have no units. Multiplicative effect functions should have f(1)=1. This property is a must for the product of the effects return normal value of the auxiliary when all affacting variables are at their normal values. Multiplicative effects have always positive values, below or above 1.

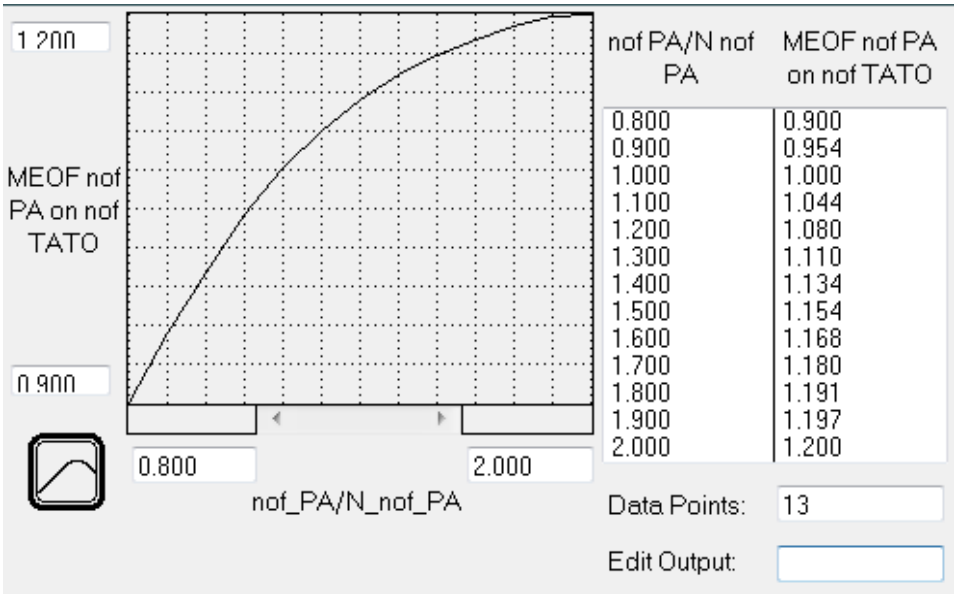

Figure 6 Direct Proportional Multiplicative Effect Function

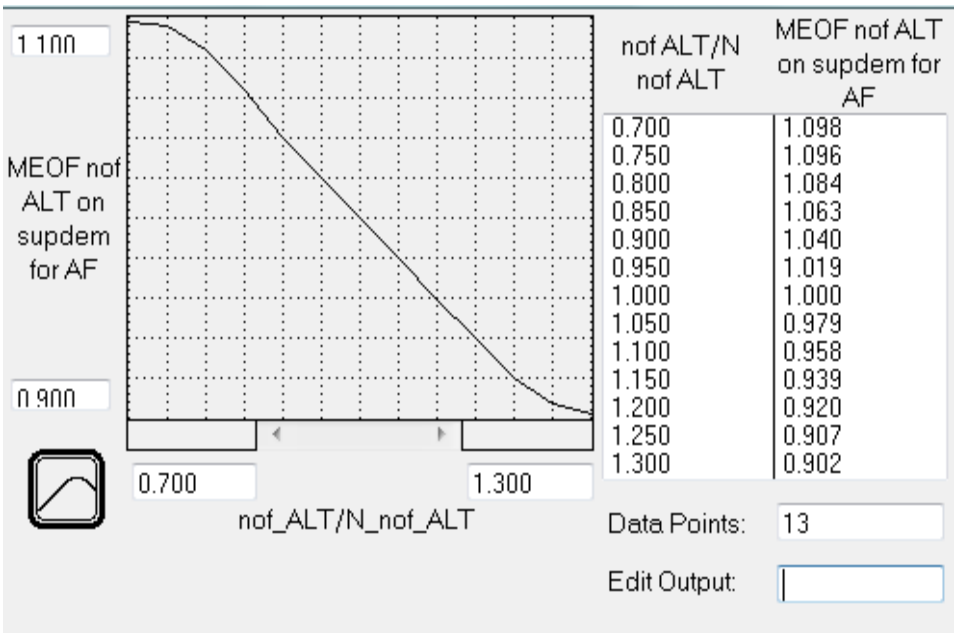

Figure 7 Inverse Proportional Multiplicative Effect Function

There are also some ‘irregular’ additive and multiplictive effect functions in the model. These functions are required when inputs to these functions are not ‘normalized’ values, but indicates kind of ‘presence’ or ‘absence’ for the input variables. Two irregular functions of additive and multiplicative effects are shown in Figures 8 and 9 respectively. Having input value of 0 means the ‘absence’, and positive values mean ‘presence’ of the related variable. f(0)=0 for irregular additive effect functions (rather than f(1)=0) and f(0)=1 for irregular multiplicative effect functions (rather than f(1)=1).

5.5 Collection Of Neccessary Data

While writing down the mathematical formulations describing the cause and effect relations between the model variables, several groups of neccessary data emerged which are needed to run the simulation. The list of these groups are:

- **Initial** values of stocks
- Normal flow fractions (**N_PCI’s**)
- Normal values of the auxiliaries (**N’s**)
- Additive effect functions of some variables on other variables (**AEOF’s**)
- Multiplicative effect functions of some variables on other variables (**MEOF’s**)
- Values of Parameters, Values of Policy variables
- Functions of other auxiliary variables

The primary resource to collect the above data was the literature survey given in Chapter 3 of this work. Whenever it is impossible to find or calculate the neccessary data from there, elite structured interviewing is used for collecting data.

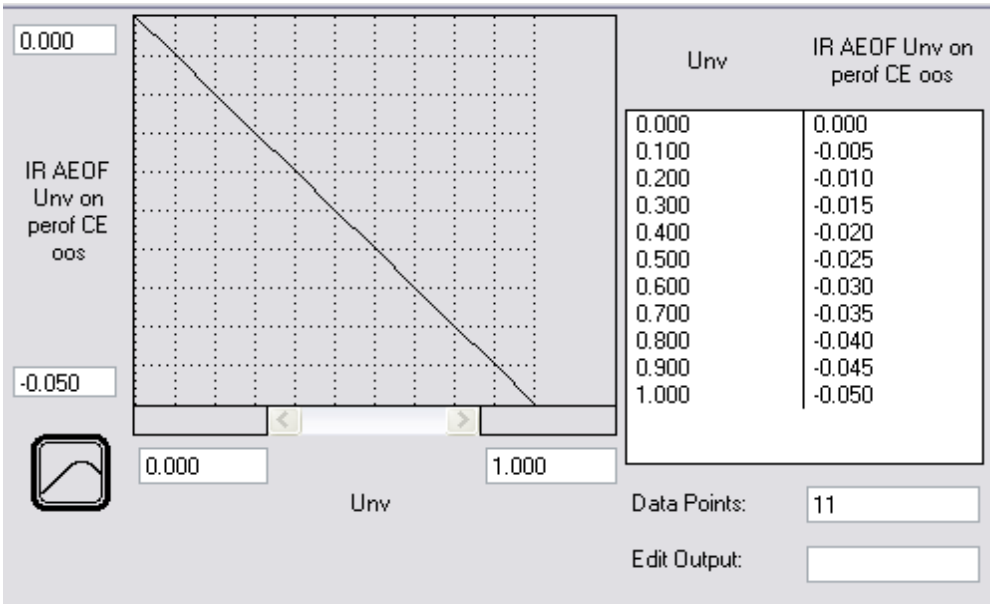

Figure 8 Irregular Inverse Proportional Additive Effect Function

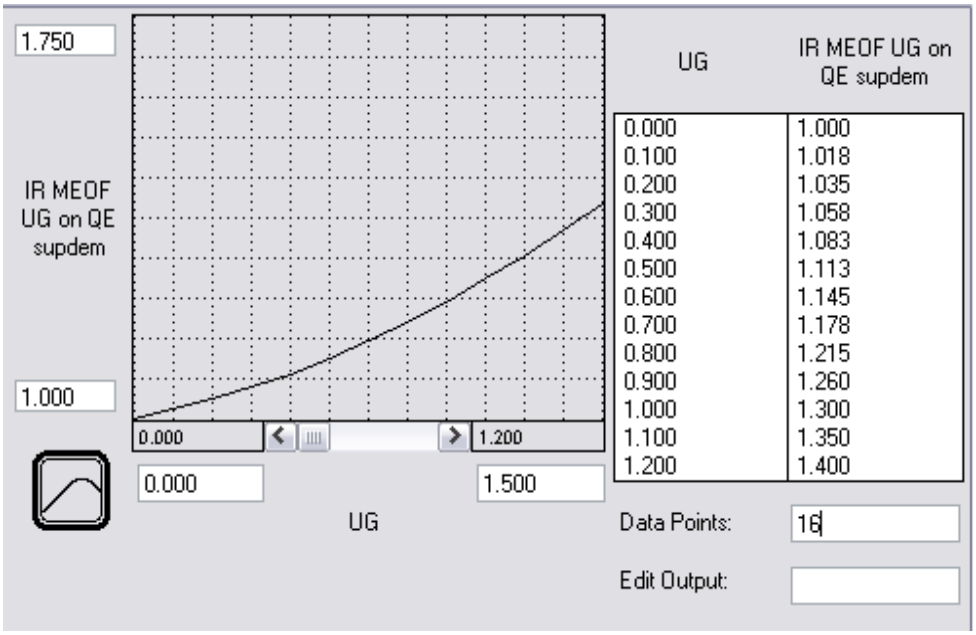

Figure 9 Irregular Direct Proportional Multiplicative Effect Function

The list of data found from Chapter 3 or calculated depending on it and the assumptions made above, are given in Appendix A; together with their explanatory statements. The rest of data is collected by making Structured Interviews.

Interviewing is chosen for this work, because of its advantages to deal with complex questions. Many of the effect formulations above are difficult to be explained and obtained on a questionnaire or any written form. Kumar (1999) points out the advantages of interviewing as; its suitability for complex situations, usefulness for gaining in-depth information, the opportunity to supplement information from non-verbal reactions, to explain questions and to be used with almost any type of population.

Although survey research methods such as large scale interviewing to collect data from a random sample of people are commonly used in literature, Patton and Sawicki (1993) support that policy analysts often use the basic and quick **Elite Or Specialized Interviewing.** Elite interviewing supports gathering information in a short period, about issues where there is little literature, in situations where respondents can not easily write certain answers themselves, quantitative data are difficult to obtain, and/or not every random respondent would be sensitive to the policy problem. By elite interviewing a policy analyst can obtain expert opinion and have access to unpublished materials.

For policy analysis, having expert opinion from a small number of people and obtaining specific unpublished data on the subject are more useful than having mass information from a great but mostly “unrelated with the problem” population. Random sampling and statistical calculations are meaningful for questions which can be answered by anyone. For example, average age or average income of a population can be estimated by asking

a number of people (sample size), within a given accuracy and at a confidence interval. But any random person in Alanya Tourism Sector probably won't put a direct answer to a question such as "How many enterprices out of 100 are closed or idle out-of-season in Alanya?", which is a kind of data that have never been tabulated anywhere. Moreover, in a local sector, there are many different power groups whose ideas should be represented for a related policy analysis, which cannot be assured by a randomized approach. That is to say; to collect a list of complex, specific, relational data as in the case of this study, elite interviewing is more meaningful than mass interviewing. Therefore, this method is employed in this study, too.

Patton and Sawicki (1993) state that, before collecting data with interviews, one must have an accurate understanding of the current situation about the context; like basic facts, historical data, political information and forecasts about future. This is another reason for the presence of "Factors and Dynamics of Alanya Tourism Sector" chapter in this work.

Supported by all these reasoning, the interview Schedule to collect neccessary data about Alanya Tourism Sector is constructed using open-ended questions (because of the potential complexity of answers) and applied to a list of 12 'elite's, representing different power groups of the sector. A list of interviewees can be found in Appendix B. The related interview schedules can be found in Appendix C. Data collected from interviews are derived by calculating the mean of the answers given to each interview question.

"As inaccuracies can be introduced into a study at any stage, the concept of validity can be applied to the research process as a whole or to any of its steps" (Kumar, 1999, p. 137). Kerlinger (1973) explains the concept of validity with questioning "Are we measuring what we think we are

measuring?" (p.457). The interview schedule used in this work is proven to have "face and content validity". According to Kumar (1999), to have face validity, each question on a schedule should have a logical link with an objective and to have content validity, questions in the schedule should cover the full range of the issue. The objectives and issues versus interview schedule questions matrix can be examined in Appendix D, supporting that the instrument has face and content validity.

Reliability of a research tool means "the extent that repeat measurements made by it under constant conditions will give the same results" (Moser & Kalton, 1989, p. 353). Factors like wording of questions, the physical setting, the respondent's mood and the nature of interaction can affect reliability of an instrument (Kumar, 1999). In this study, in order to establish reliability, keeping the factors above constant and suitable for each interviewee are paid great attention through elite interviewing; rather than applying rest-retest, parallel forms of the sama test or the split half technique methods which are thought to have less contribution for reliability in elite interviewing.

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All mathematical formulations of Alanya Tourism Sector Formal Model together with collected data can be found in Appendix E.

5.6 Verification And Validation

As previously stated, policies are established rules to solve problematic dynamics of systems. In order to solve these problems, System Dynamics bases on its 'systems perspective' and establishes a model; to represent the dynamics which are essentially caused by the internal structure of the

system. Then, simulations are performed on the model and depending on the simulation results, policy analysts evaluate the 'problems' and also make distinguishments between policy alternatives. Then, credibility of these models (therefore, simulation results) should be investigated by verification and validation testing techniques *through* the life-cyle of the simulation study (Balci, 1994).

Verification means testing whether the formal model is an accurate representation of the conceptual model. The purpose is assuring there are no inconsistencies between the model and dynamic hypothesis (Barlas, 2003). This means controlling the simulation model to see and correct the logical errors (according to the causal loop diagram) if there are any; to make sure the implemented model does what the modeler intends to do. (Barlas, 1996) *"Model verification deals with building the model right".* (Balci, 1994, s. 215).

Kleijnen (1995) supports the idea of Balci (who argues that verification and validation testing are applied *through* modelling) and he suggests that; general good programming practice (such as modular programming) and checking intermediate simulation outputs through tracing and animation would be used for verification testing. In our modelling study, the model of Alanya Tourism Sector is verifed through these 2 practices. The model was built element by element, from the beginning to the end. Firstly there was only a stock and its biflow contributors. This piece of model was animated, evaluated using the intermediate simulation outputs and modified (if necessary) until it did what it was intended to do for this 'module' of model. Then the second stock and its biflow contributors added. The same testing is applied to them, too. After all 'stock modules' are implemented and tested, auxiliary variables which belong more than one 'modules' are added one by one. They were also put in tha same testing process. Up to this step, extra care was given in order not to complete the feedback loops

present in the model. Every ‘relational’ arrow emanating from a stock and ‘completing’ a feedback loop was intentionally not implemented at first, in order to observe the effects of circular causalities clearly; which are added later one by one. Thus the process of modelling is verified.

Validation is the next step, which shows whether the model is an appropriate designation of the real dynamics with respect to the policy problem in concern (Barlas, 2003). “*Model validation deals with building the right model”* (Balci, 1994, s. 215).

On the other hand, Sterman (2000) reminds that validity means being supported by objective truth, and he claims that it is impossible to verify a model since all models are wrong. This is because all models are built upon “abstractions, aggregations and simplications of what somebody perceived, thus being more subjective in every aspect” (Kuzucu, 2005, p. 21). Nevertheless, as Shreckengost (1985) stated; in modeling we are more concerned with *usefulness* than validity. Supporting this statement, Barlas and Carpenter (1990) defined model validation in system dynamics as showing that a model is an *adequate* and *useful* description of the problematic part of the real system.

This kind of model validation is a two step process (Barlas,1996). Firstly a model should be validated structurally. This is questioning the structure of a model whether it is a meaningful identification of the real relations that creates the problematic dynamics in the system. As Barlas (2003) pointed out, structural test examples are evaluation of the structure by experts, and robustness of equations under extreme conditions. Structural validity must be established before passing to second step of validation.

Testing Robustness of equations under extreme conditions is the structural validity test employed in this work. Thus, plausibility of the simulation

results are validated observing what would happen under similar conditions in real life (Forrester & Senge, 1980). Although it is a hard task to know what values each variable will take in normal operating conditions, it is relatively easy to guess what they will be (asymptotically) under extreme conditions (Barlas, 1996). Therefore, this test can be done by anticipating how our model will behave (asymptotically) under extreme conditions and comparing this logical anticipation with the 'equally extreme-conditioned' (applied on a single input variable) simulation results.

Forrester and Senge (1980) suggest making extreme-conditions test by applying imaginary maximum and minimum (zero, infinity) to each state variable to observe plausability. This approach is employed in our study. Each state variable is initiated with imaginary minimum (zero) and imaginary maximum (depending on the state variable). Behavior of output variables are shown in Appendix F. Asymptotical behaviors of output variables get along with logical expectations. That is to say, in the normal operating range we can anticipate logical results from our model which behaves logically even in extreme conditions. Therefore, structural validity of the model is proved.

> Extreme condition testing is primarily important for policy analysis: Reason for utilizing the extreme conditions test is to enhance usefulness of a model for analyzing policies that may force a system to operate outside historical regions of behavior. A model which only behaves plausibly under "normal" conditions can only be used to analyze policies which do not cause the system to operate outside of those conditions. By examining model structure for extreme conditions, one develops confidence in a model's ability to behave plausibly for a wide range of conditions and thereby enhances the model's usefulness to explore policies that move the system outside of historical ranges of behavior (Forrester & Senge, 1980, p. 214).

Second step of validation is testing the dynamic patterns generated by the model (behavior testing) to see if they resemble the real dynamic patterns of the system. This means comparing the patterns generated by the model with the real dynamic behavior (Barlas, 2003). Comparison of generated and real patterns does not mean a point by point comparison, because "even 'perfect' structures may not yield accurate point predicition (Barlas, 1996, p. 193). Instead Slopes, optima and oscillation periods are all important measures for pattern based comparison.

However, the primary reason to build a model for policy analysis is *forecasting* the unknown future dynamics (and then, evaluating the policy results accordingly). Therefore, trying to compare forecasted results with an unknown set of data from real life in future is meaningless for policy analysis process. One can ask about comparing real life data with simulation outputs as years pass and some 'real dynamic patterns' are observed. This comparison is also meaningless in the context of policy analysis and will contribute very little to a system for which a policy selection is *already* made depending on the established model and the selected policy is *already* implemented.

Therefore, the most appropriate source of assessing model validity for policy analysis is resorting expert opinions. This type of behaviour testing is applied in this work and dynamic patterns generated by the model are found logical to resemble the real dynamic patterns of the system.

5.7 Analysis Of The Model

The core issue in model analysis step is understanding the dynamic properties of the model; why the model behaves the way it does. This

analysis is carried on by a set of simulation experiments. As Barlas (2003) stated, “A series of logically related simulation runs can provide quite reliable (although not exact) information about the properties of the model. These simulation runs are also called sensitivity tests, as they try to assess how much the output behavior changes as a result of changes in selected parameters, inputs, initial conditions, function shapes, or other structural changes” (p.1144).

The sensitivity of model behavior to the *policy parameters and/or policy structures* mean policy analysis. Policies are conscious rules to implement in the system in order to control the behavior of it. Policies are defined by set of parameter values, function values, function shapes and forms of policy equations (Barlas, 2003). Policy analysis involves altering one or more of the policy rules and investigating the resulting behaviour, to see the expected impacts of each policy on evaluation criteria.

Both model analysis and Policy analysis can be done numerically or pattern oriented. Since the purpose of “System Dynamics” approach is to understand and improve the undesired Dynamic behaviours in the system, pattern-oriented analysis on evaluation criteria is much more essential.

Scenario writing will be used as the technique for presenting the results of the policy alternatives. Scenario writing generally focus on the political and qualitative components of the policy analysis process but essentially “describe future states of the world” (Patton & Sawicki, 1993, p. 313), if various alternatives were to be adopted. In this work, scenarios will serve the pros and cons of each alternative, they show why some of the alternatives are superior whereas some others are dominated.

This evaluation stage in policy analysis step will point the alternatives that satisfy most or all the major criteria, that are economically or technically

feasible and the ones politically exceptable. As Patton and Sawicki (1993) stated, any of these alternatives implemented or not is essentially a political issue.

5.7.1 Baserun (No Action Alternative)

The model representing Alanya Tourism Sector is simulated with no action, (called as “baserun”) keeping all variables in their current values, and the following results are obtained; in Figure 10. Corroborative policy outcomes can be monitored in Appendix G.

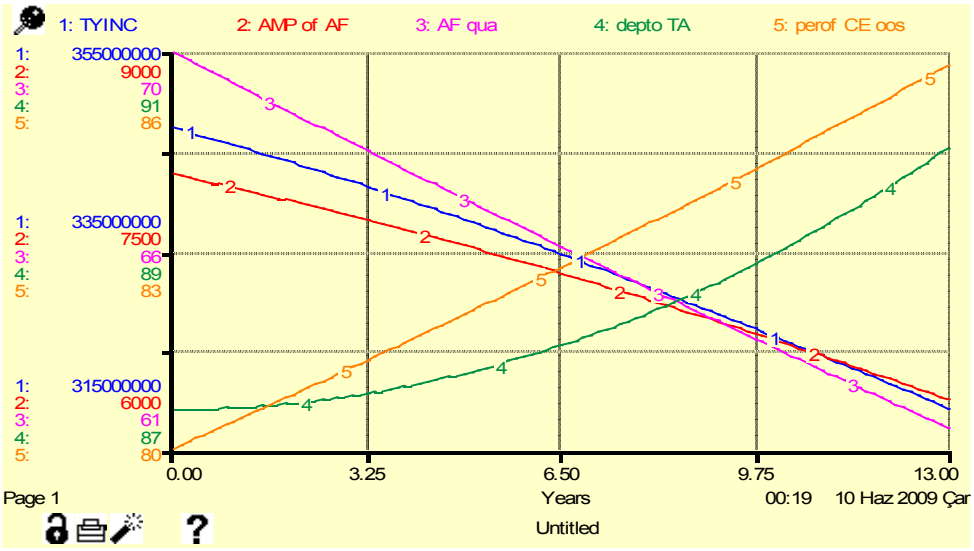

Figure 10 Ouputs of No Action Policy - 1

In this baserun outputs, it is clearly shown that if no action is taken for Alanya Tourism Sector, Total Yearly Income (TYINC) from Accomodation Facilities (AF) will continiously decrease as well as the Average Monthly

Profit (AMP) of AF, for the next 13 years after the end of 2007. AF quality will also decrase year by year. On the other hand dependency to Travel Agencies (depto TA) is exponentally increasing and this increase will gain speed towards the end of 13 years. In addition, Percentage of Closing Enterprises Out Of Season (perof CE oos) will accrue too.

When the decreases in TYINC and AMP are examined, the first reason seems to be decrasing Average Accommodation Prices (AP) for a one day stay, which means a decreasing Profit of AF (PR of AF) from a one day stay. This “decrease” is mainly the result of the decreasing Average Accomodation Prices forced by Travel Agencies (AP fby TA) and increasing depto TA. Average Accomodation Prices desired by AF (AP deby AF) is also decreasing but not as fast as AP fby TA, rather slowing down towards the end of 13 years. Average Cost Of A Tourist Per Night For Accomodation Facilities (AC) seems to stay the same.

The second source of decreasing TYINC and AMP is the decrasing Number of All Tourists (nof ALT) who are also the source of the incoming Money. The decrease in Number of Tourists For "All-Inclusive" Tourism (nof TAI) causes nof ALT to decrease too. There will be a slight decrease in Average Seasonal Period without Travel Agencies (SP wo TA). An interesting point is that Number of Accommodation Facilities (nof AF) has an increasing trend in recent years, but it will also change its direction and begin to decrease too, because of the decreasing AMP; but this effect won’t be sufficent to slow the decrease in AMP.

5.7.2 NAC Policy

In this policy alternative, NAC is assumed to be realized starting from the end of year 2 (2009), and began to be used by tourists and TA effectively

through years 3 and 4. Capacity increase is foreseen for the following years.

NAC = GRAPH(time)

(0.00, 0.00), (1.00, 0.00), (2.00, 0.00), (3.00, 0.5), (4.00, 0.75), (5.00, 1.00), (6.00, 1.05), (7.00, 1.10), (8.00, 1.15), (9.00, 1.20), (10.0, 1.25), (11.0, 1.25), (12.0, 1.25), (13.0, 1.25)

The policy implemented into the model as above, gives the following results; in Figure 11. Corroborative policy outcomes can be monitored in Appendix G.

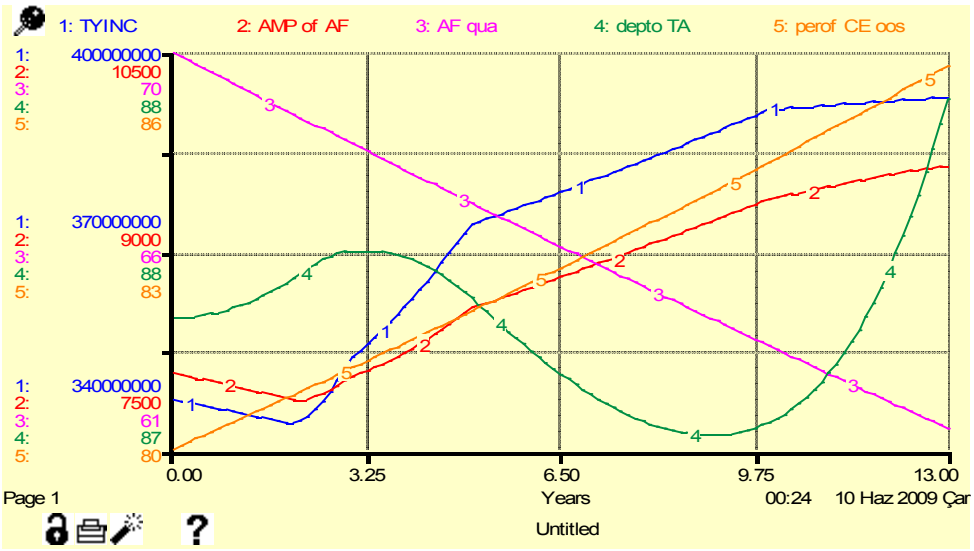

Figure 11 Ouputs of NAC Policy - 1

NAC alternative makes a big jump in TYINC, whose increasing pattern slows down as the airport capacity reaches its maximum number of visitors.

The same ‘slowing down’ increasing pattern is observed in AMP of AF, too. This is becausethe rapid increase in nof ALT, AP and PR of AF is not supported by an increase in AF quality, which causes nof ALT to decrease day by day after the airport capacity can no longer be increased. AP and PR of AF will reach their peaks and begin to decrease sometime in the future, too; because of the same reason.

In NAC alternative, depto TA decreased first, but it again gained a slight (for now) but exponential increase after year 9. This is mainly because of the encouraging additional increase in AP fby TA (which is also the motor of increase in AP and PR of AF) and rapidly increasing trend in nof AF (that is to say, in AF competition).

In NAC alternative, nof TAI is the source of increase in nof ALT, because nof TATO stays the same. Although nof TAI will also start to decrease after the airport reaches to its maximum capacity, this won’t prevent nof AF from increasing for a long while; which will also cause AMP of AF to decrease slightly after year 13. SP wo TA goes on decreasing in NAC alternative, which brings along an increased value of perof CE oos again.

Therefore, one can conclude that NAC alternative brings rapid changes in Alanya Tourism Sector Dynamics and its positive effects in TYINC and AMP will not diminish for a long time. One and the biggest drawback of this alternative is it only reinforces All Inclusive (AI) dependent tourism (leaving Alternative Tourism Opportunities and perof CE oos completely unsupported) in a quantitative way (that is to say, no increase in AF quality is created). Decreasing AF quality will be the source of diminishing advantages of this alternative in the future.

5.7.3 Increasing ATO Policy

In this policy alternative, ATO is increased to its double (from 3 to 6) linearly (increasing each year by 0.25), starting from year 2 (2009) up to the end of year 13 (2020).

nof_ATO = GRAPH(time)
(0.00, 3.00), (1.00, 3.00), (2.00, 3.25), (3.00, 3.50), (4.00, 3.75), (5.00, 4.00), (6.00, 4.25), (7.00, 4.50), (8.00, 4.75), (9.00, 5.00), (10.0, 5.25), (11.0, 5.50), (12.0, 5.75), (13.0, 6.00)

The policy implemented into the model as above, gives the following results; in Figure 12. Corroborative policy outcomes can be monitored in Appendix G.

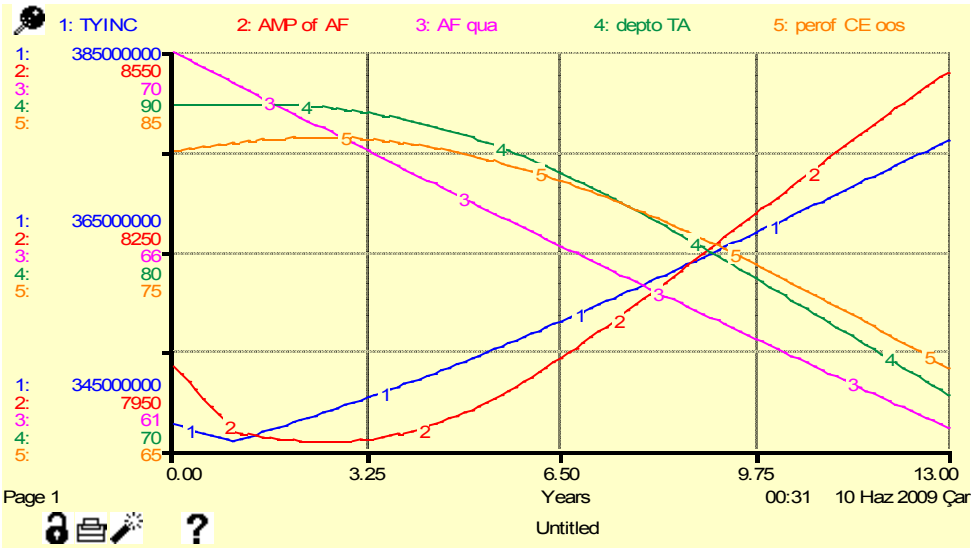

Figure 12 Outputs of Increasing ATO Policy - 1

The effect of ATO policy in TYINC is a gradual increase. At the beginning, this policy will cause a slight decrease in AMP in the first year after the policy is implemented, afterwards the increasing effect of TYINC will be observed in AMP, too; which has a nondecreasing trend for a long future. As a consequence, nof AF will follow the increase in nof AMP.

In this policy, both AP fby TA and AP deby AF is decreasing, because of no encouraging effect of the policy for TA, and no increase in AF quality, respectively. On the other hand, a slight but gradual increase in AP, also in PR of AF is observed caused by decreasing depto TA. This is because decreasing depto TA caused AP to converge more to AP deby AF. AC does not change.

As it can be predicted, the main effect of this policy will be the increase in nof TATO, the increase in SP wo TA and the decrease in perof CE oos. The increasing SP wo TA is also the motor of decreasing trend in depto TA, together with the decreasing AP fby TA. AP fby TA is decreasing because nof TAI and AF qua is decreasing, too; nevertheless nof ALT will continue increasing because of the increasing nof TATO.

In conclusion, increasing ATO is a policy causing gradual, respectively slow but sustainable increases in TYINC and AMP. Its positive effects are seen in depto TA, SP wo TA, and perof CE oos, which are mostly related with ATO, but no encouraging effect for AI dependent tourism. Another main drawback is that it has no effect on AF quality.

5.7.4 Constructing a Unv Policy

Another policy alternative for Alanya Tourism Sector, which has also other big impacts on other sectors too, is the construction of a University (Unv) in

Alanya. In this policy alternative, Unv is predicted to have its first students towards the end of year 3 (2011) and assumed to have the same number of students in the following years. The university reaches its maximum capacity in year 7, and keeps the same capacity in the following years.

Unv = GRAPH(time)
(0.00, 0.00), (1.00, 0.00), (2.00, 0.00), (3.00, 0.00), (4.00, 0.25), (5.00, 0.5), (6.00, 0.75), (7.00, 1.00), (8.00, 1.00), (9.00, 1.00), (10.0, 1.00), (11.0, 1.00), (12.0, 1.00), (13.0, 1.00)

The policy implemented into the model as above, gives the following results; in Figure 13. Corroborative policy outcomes can be monitored in Appendix G.

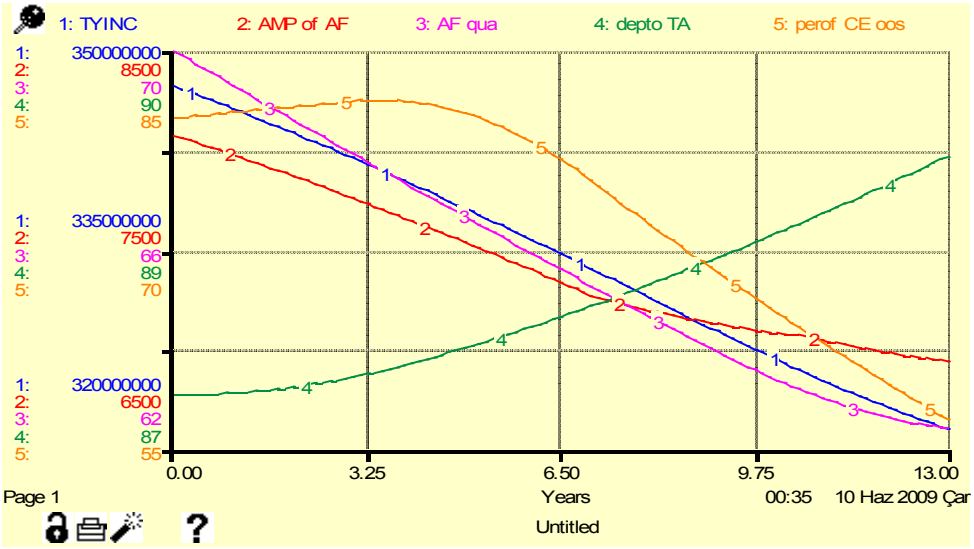

Figure 13 Outputs of Constructing a Unv Policy - 1

This policy is a very slow responding policy, even if its effects on TYINC would be seen after 13 years and its effect on AMP of AF is a relatively slowly decreasing pattern after the first graduates of the university are diffused into the sector (year 7). An increase in AMP of AF would be observed only when the positive effects of the policy on TYINC become clearer.

The most advantageous profit from this policy is the big and sustainable decrease in perof CE oos and the promising effect of it on AF quality. After AF quality overshoots to its minimum towards the end of year 13, it will turn its direction up and begin to increase, which will also bring the increase in TYINC and AMP in the following years.

In this policy depto TA is increasing year by year as in baserun case, because of the faster decrease of AP deby AF than AP fby TA. On the other hand, as in AF quality, AP deby AF overshoots to its minimum towards the end of year 13 and will begin to increase (the same is valid for AP), which means that depto TA will turn its direction up, too; after some time.

Although AP will go on decreasing through the 13 years, a quick decrease in AC is observed when the first graduates of the university are diffused into the sector, causing a slower decreasing pattern for PR of AF and a gradual increase in Percentage of Qualified Employees (perof QE) working in AF. This effect is also the source of slower decreasing pattern in AMP of AF, after year 7.

The slow responding effect of this policy is also observed in nof ALT. Because Unv policy does not change nof TATO, the motor of change in nof ALT is nof TAI. As in the cases in AP deby AF and AF qua, nof TAI will overshoot to its minimum towards the end of year 13 and begin to increase

afterwards. Nof AF will turn its direction up in the future, only when AMP increases to its “normal” value again.

In sum, Unv policy is a broad policy, whose effects are not focused on a single sector. It is also a slow responding one, even its promising effects will be seen after 13 years. But the advantageous point with this policy is that it is a promising one nearly for all sector variables in the future.

5.7.5 Increasing TEO Policy

In this policy, TEO is increased to its double (from 3 to 6) linearly (increasing each year by 0.25), starting from year 2 (2009) up to the end of year 13 (2020).

TEO = GRAPH(time)
(0.00, 3.00), (1.00, 3.00), (2.00, 3.25), (3.00, 3.50), (4.00, 3.75), (5.00, 4.00), (6.00, 4.25), (7.00, 4.50), (8.00, 4.75), (9.00, 5.00), (10.0, 5.25), (11.0, 5.50), (12.0, 5.75), (13.0, 6.00)

The policy implemented into the model as above, gives the following results; in Figure 14. Corroborative policy outcomes can be monitored in Appendix G.

Because the gradual effect of the policy could start to increase AF quality just about year 5, it will also manage to increase AP deby AF and nof TAI close to year 6 which will lead the increase in TYINC after year 6.

On the contrary, AMP of AF shows a fast increasing pattern, which is followed by a fast decrease, and then again a fast increase; all in a relatively small range. Actually, the first increase-decrease pattern is

originated from the slight increase-decrease pattern in PR of AF. PR of AF increases firstly due to the decreased AC (because of increased TEO and decreased QE sal) but then decreases because of decreasing AP and increasing AC because of the increased perof QE. The motor of the last increase in AMP of AF comes from the increased nof ALT (nof TAI) close to year 6.

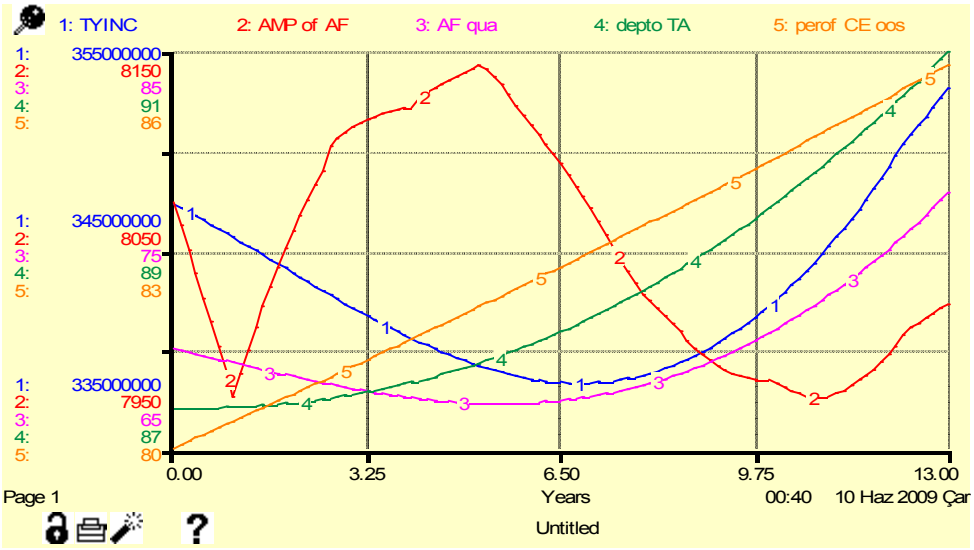

Figure 14 Outputs of Increasing TEO (Linearly) Policy - 1

In this policy depto TA increases faster than baserun, both AP fby TA and AP deby AF increases. As told implicitly above, SP wo TA has no improvement in this policy. This brings increasing perof CE oos. Nof AF also increases continiously through 13 years because AMP of AF is always above or slightly below its normal value although it shows rise and falls. Like this case, as long as an increase in AP deby AF is not accompanied by an increase in SP wo TA and/or a decrease in nof AF (in AF competition),

the increase in AP fby TA will have more momentum than the increase in AP deby AF and this dependency will not improve.

In conclusion, increasing TEO is a respectively slow policy because its effect on TYINC can be felt after a few years, but not as slow as in the Unv case. The motor of change in this policy is the expected increase in AF quality, thus in nof TAI. It will cause some oscillations in AMP of AF, but it will be always above or slightly below its normal value. The policy has nearly no effect on depto TA and perof CE oos.

5.7.6 Increasing PA Policy

In this policy, PA is increased to its double (from 3 to 6) linearly (increasing each year by 0.25), starting from year 2 (2009) up to the end of year 13 (2020).

nof_PA = GRAPH(time)
(0.00, 3.00), (1.00, 3.00), (2.00, 3.25), (3.00, 3.50), (4.00, 3.75), (5.00, 4.00), (6.00, 4.25), (7.00, 4.50), (8.00, 4.75), (9.00, 5.00), (10.0, 5.25), (11.0, 5.50), (12.0, 5.75), (13.0, 6.00)

The policy implemented into the model as above, gives the following results; in Figure 15. Corroborative policy outcomes can be monitored in Appendix G.

If PA is increased linearly, a gradual increase in TYINC and AMP of AF is observed. The increase in TYINC stops towards the end of year 13, and begins to decrease because of the decreasing nof TAI originated from decreasing AF qua. The increase in AMP of AF gains speed towards the end of year 13 because of the increase nof ALT and PR of AF.

The slight increase in PR of AF comes from the slight increase in AP, originated from the decreasing depto TA. The decrease in depto TA brings the value of AP closer to the value of AP deby AF, although it is getting slighly less and less year by year. AC stays the same. The advantageous point is that depto TA decreases due to the increase in SP wo TA. The increase in SP wo TA also brings the increase in nof TATO and the decrease in perof CE oos.

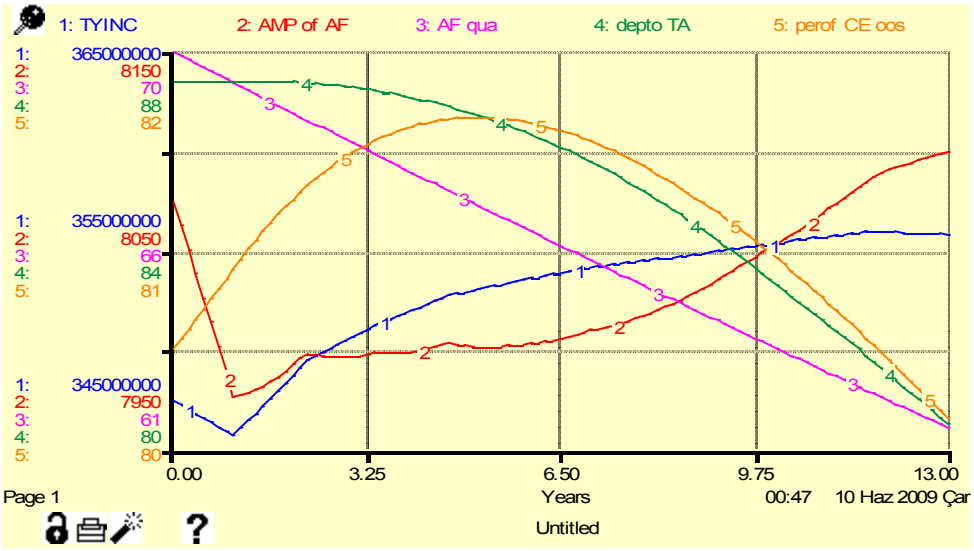

Figure 15 Outputs of Increasing PA (Linearly) Policy - 1

In conclusion, PA is a quick responding alternative but its advantageous outputs quickly diminish. The policy brings a quick solution for TYINC and AMP of AF, but if it is not supported by another policy, the positive effects easily dissappear, because it has no effect on AF qua. Depto TA and perof CE oos improves thanks to the increase in SP wo TA.

5.7.7 Establishing AIST Policy

In this policy alternative, AIST are increased from 0 (meaning “none”) to 20 (meaning 20 new standards) at the end of year 3 (2010) and present AF are assumed assumed to work within the AIST esatblished afterwards.

nof_AI_ST = GRAPH(time)
(0.00, 0.00), (1.00, 0.00), (2.00, 0.00), (3.00, 20.0), (4.00, 20.0), (5.00, 20.0), (6.00, 20.0), (7.00, 20.0), (8.00, 20.0), (9.00, 20.0), (10.0, 20.0), (11.0, 20.0), (12.0, 20.0), (13.0, 20.0)

The policy implemented into the model as above, gives the following results; in Figure 16. Corroborative policy outcomes can be monitored in Appendix G.

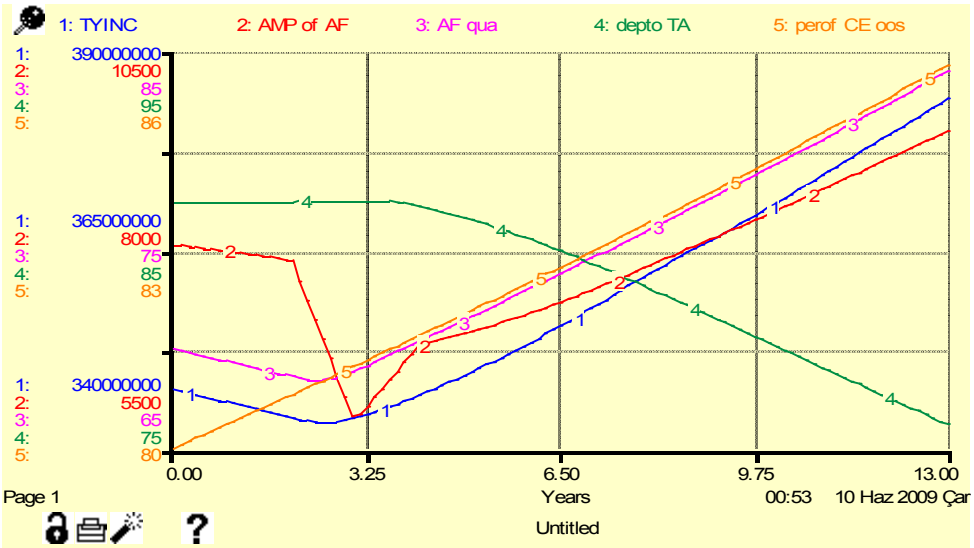

Figure 16 Outputs of Establishing AIST Policy - 1

This policy differs from the others as AIST brings a big amount of Non Recurring Costs (NRC) to AF in the beginning of policy implementation and a small daily cost for running the standarts. This policy eliminates some AF in the beginning of the policy implementation who could not tolerate this amount of NRC and the decrease in AMP of AF. Thus AF supply will decrease and AMP of AF will recover quickly. Because of this decreased competition between AF, depto TA will also decrease. AF qua will linearly increase thanks to the importance given to the standarts, which will also bring the linear increase in nof TAI, and thus in TYINC.

Both AP deby AF and AP fby AF increases due to the increase in AF qua. Increasing AP will recover the increase in AC (because of additional AIST running costs) and PR of AF increases, too; which is another source of increasing AMP of AF. Perof CE oos is not affected by this policy and it goes on increasing as SP wo TA goes on decreasing.

Concluding, constructing new AIST is a very promising alternative for Alanya Tourism Sector, thinking the sustainable TYINC and AMP of AF increase in the system. Nevertheless, it is quite a hard policy to implement because many sector partners will resist to it, as it will cause many AF to close and others to “loose” money (AMP of AF) in the beginning of the implementation. AF qua and nof TAI is absolutely improved where as there is no improvement in SP wo TA as in perof CE oos. This is a AI dependent tourism reinforcing policy alternative, too.

5.8 Sensitivity Analysis

Sensitivity analysis means testing the robustness of our conclusions important to our purpose, by varying our assumptions over a logical range of uncertainty (Sterman, 2000).

> By showing that the system does not react greatly to a change in a parameter value or to an assumption, sensitivity analysis may mean a lot to the analyzer, such that, results may reduce analyzer's uncertainty in the behavior observed or assumptions made, it can be an indicator of the fact that the issue under analysis is a or is not a vital element for the system. Furthermore, a modeler may need to use variables or refer to mathematical equations that are very difficult to measure or quantify to a great deal of accuracy. Sensitivity analysis, at this point, enable analyzers to test the validity of their assumptions and measurements (Kuzucu, 2005, p. 92).

According to Sterman (2000), three types of sensitivity can be observed: Numerical, behaviour and policy sensitivity. Numerical sensitivity asks whether numerical values of the model results change, behavior sensitivity asks whether modes of model behavior change significantly, and policy sensitivity asks whether the impact or desirability of a policy change; when assumptions about parameters, boundary, aggregation and the ways people make decisions are varied in the plausible range of uncertainty. Typically, models are more sensitive to assumptions about the boundary and formulations than to assumptions in numeriacal values.

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Type of sensitivity in concern for a model depend on the modeling purpose. According to Sterman (2000), behavior mode sensitivity and especially policy sensitivity make sense for most purposes. This is also the case in our work, since we will deal with **pattern-oriented policy analysis** using system dynamics approach; to interpret and improve undesirable dynamic behavior patterns in the system with the most desired policies.

> Comprehensive sensitivity analysis is generally impossible even when restricted to parametric sensitivity. Since most models are

> significantly nonlinear the impact of combinations of assumptions may not be the sum of the impacts of the assumptions in isolation. Comprehensive sensitivity analysis would require testing all combinations of assumptions over their plausible range of uncertainty. The number of combinations is overwhelming even in models of modest size. Given the limited time and resources in any project, sensitivity analysis must focus on those relationships and parameters you suspect are *both* highly uncertain *and* likely to be influential. A parameter around which no uncertainty exists need not be tested. Likewise, if a parameter has but little effect on the dynamics it need not be tested even if its value is highly uncertain because estimation errors are of little consequence (Sterman, 2000, p. 884).

Supported by the above statement, "*both* highly uncertain *and* likely to be influential" parameters and relations that will be varied through our sensitivity analysis, in relation with our modeling goal (to interpret and improve undesirable dynamic behavior patterns in the system with the most desired policies) and policy goal (increasing the sustainability of tourism sector in Alanya and making Alanya a competing tourism center both in quality and touristic variety) are explained below.

There are a number of tools for making sensitivity tests by varying paramaters. Remembering the above statements about "the impact of combinations of assumptions may not be the sum of the impacts of the assumptions in isolation" but "the number of combinations is overwhelming even in models of modest size", the most appropriate sensitivity analysis tool for our model becomes 'Best and worst case sensitivity analysis". In our analysis we set 5 cases: 1-Worst, 2-Worse, 3-Base, 4-Better and 5-Best cases. In best (worst) case we set the above listed parameters to the most (least) favorable, plausible values for the desired outcomes. Then we

observed patterns of TYINC, AMP of AF, AF qua, depto TA and perof CE oos variables with these 5 cases in each policy alternative. The results obtained can be monitored in Appendix H, with comparative graphs.

In each policy alternative, for every output variable; except depto TA, the patterns of behaviour in the best and worst cases are the same. Besides, the decreasing patterns become increasing ones especially in extreme cases, when all of the above parameters are set to their most favorable values, but of course this is an expected result.

The situation with depto TA is different. As it can be observed from depto TA patterns, depto TA shows high behavior mode sensitivity and policy sensitivity. This sensitivity does not originate from any structural inconsistency but do originate from the fact that depto TA is in a positive feedback loop with wwo_TA_ind and in a negative feedback loop with supdem for AF. In different sensitivity runs at different moments, one loop becomes dominant and in an other run the other loop becomes dominant due to the nonlinear additive effect functions in each loop. This causes depto_TA make extreme points and change its way to ‘increasing’ or ‘decreasing’ patterns in different years. Another reason for this sensitivity is wwo_TA_ind variable influencing depto TA is calculated using a division, whose numerator includes depto_TA and denominator includes (100-depto_TA). This situation brings sensitivity for depto_TA, too.

Other than the above parameters which are varied to their worst and best cases, additive and multiplicative effect functions in the model can be varied, too. Increasing their maximum effect values, decreasing their minimum effect values, or changing the shapes of effect functions will of course squeeze or strech the behavioral patterns of the model in time or in vertical axis. But a high behavior mode sensitivity or policy sensitivity would

not be observed, as can be seen in Appndix H. Model behavior and policy outcomes are in expected range.

Varying some formulations will also change the impacts of policies and behavior of the model. "*Both* highly uncertain *and* likely to be influential" formulations in our model are:

IR_AEOF_NRC_on_nof_AF = -(NRC/AMP_of_AF)/4
nof_TAI = nof_int_TAI*PR_of_TA_fr_AO
wwo_TA_ind = (AP_fby_TA*depto_TA) / (AP_deby_AF*(100-depto_TA))

These formulations are "defined by the modeler" formulations, therefore they always have the chance to be defined in another way. Dividing (NRC/AMP_of_AF) by 6 (instead of 4) or defining wwo_TA_ind with another mathematical equation will of course make a difference and cause sensitivity.

Another variation for our model that may cause sensitivity can be minifying the boundary. Because the model is already large, enlarging the boundary is not considered. The 'minified' boundary to observe sensitivity is formed by below modifications and aggregations:

- Merge nof TAI into nof int TAI.
- Delete PR of TA from AO and related auxiliaries.
- Delete nof TATO, nof ALT and related auxiliaries, merge them into nof int TAI.
- Delete QE sal and related auxiliaries.
- Modify N_AMP of AF accordingly.
- Tie necessary 'relational arrows' to the most related variables.

The resulting ‘minified’ model, and impacts of each policy on this model can be observed in Appendix H. The results show that aggragating the variables and minifying the model causes numerical sensitivity but has little sensitivity on behavior mode sensitivity. However, as our minified model changes the improvement levels created by policies, it can be told that changing model boundary changes relative desirability of each policy.

Finally, the ways people make decisions can varied for sensitivity analysis. Some policies, as in the case in ‘Increasing TEO’ Policy, has some funds seperated for it, but it is difficult to decide how to spend this fund through the years. In this sensitivity analysis, the effect of time distribution of funds is also covered.

In this run, TEO is increased to its 1,5 times (from 3 to 4.5) as a step function, starting from year 2 (2009) up to the end of year 13 (2020).

TEO = GRAPH(time)
(0.00, 3.00), (1.00, 3.00), (2.00, 4.50), (3.00, 4.50), (4.00, 4.50), (5.00, 4.50), (6.00, 4.50), (7.00, 4.50), (8.00, 4.50), (9.00, 4.50), (10.0, 4.50), (11.0, 4.50), (12.0, 4.50), (13.0, 4.50)

The policy implemented into the model as above, gives the following results; in Figure 17. Corroborative policy outcomes can be monitored in Appendix G.

If the policy funds are seperated equally in time rather than spending it in increasing amounts by every year, the effects counted above will be reinforced in the first years and they form accumulations in the next years. This situation will bring overshoots to minimum or maximum to earlier years, creates sharp steps or peaks and makes the policy outputs (both good and bad) more magnified towards the end of policy period, because of

the accumulations in the system. Thus, concentrating a policy variable in time as early as possible becomes more advantageous if it does not create any unwanted overshoot or magnified disadvantageous output in the system. The key point here is that implementing a policy variable as early as possible to the desired level is difficult and generally not technically feasible as in the case of increasing ATO policy.

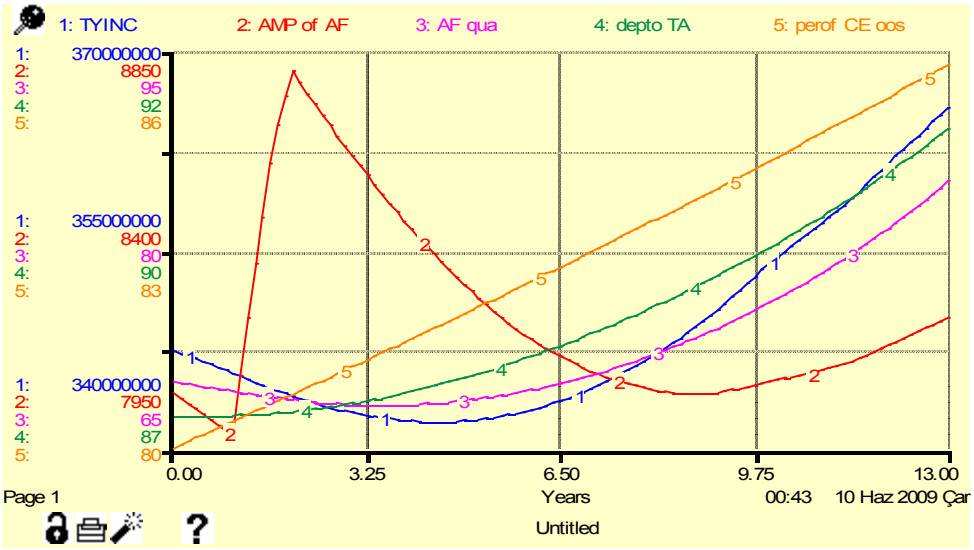

Figure 17 Outputs of Increasing TEO (Step) Policy - 1

The effect of time distribution of funds is covered in 'Increasing PA' policy analysis, too.

In this run, PA is increased to its 1,5 times (from 3 to 4.5) as a step function, starting from year 2 (2009) up to the end of year 13 (2020).

nof_PA = GRAPH(time)

(0.00, 3.00), (1.00, 3.00), (2.00, 4.50), (3.00, 4.50), (4.00, 4.50), (5.00, 4.50), (6.00, 4.50), (7.00, 4.50), (8.00, 4.50), (9.00, 4.50), (10.0, 4.50), (11.0, 4.50), (12.0, 4.50), (13.0, 4.50)

The policy implemented into the model as above, gives the following results; in Figure 18. Corroborative policy outcomes can be monitored in Appendix G.

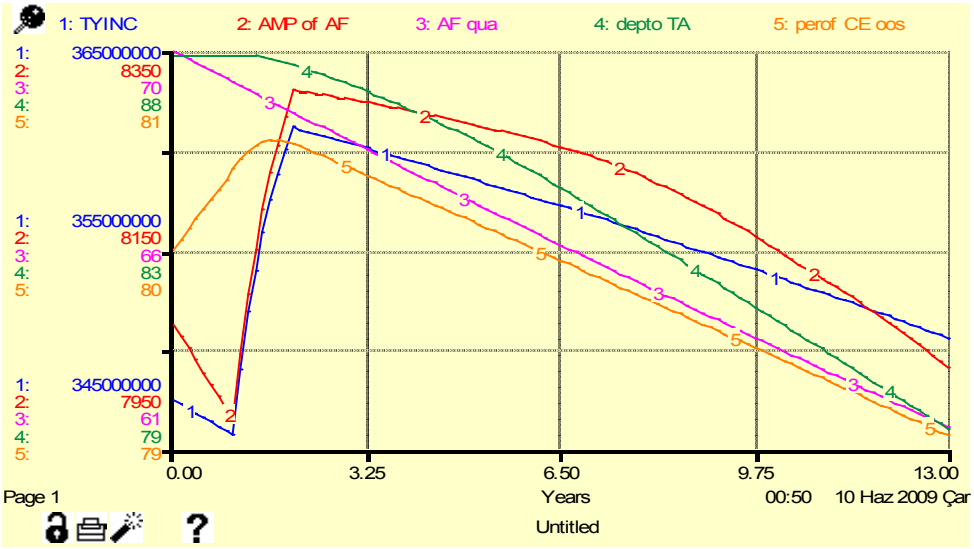

Figure 18 Outputs of Increasing PA (Step) Policy - 1

If PA is increased to1,5 times of itself as a step function, TYINC makes an overshoot in first years and the decrease in TYINC value becomes magnified towards the end of year 13. The same overshoot and then (slightly) magnified-decrease effect is also seen in AMP of AF. No change is observed in AF qua but perof CE oos is decreased more in this step-wise

alternative. Another main difference between two is that in the first alternative, SP wo TA increases gradually and reaches 4.48, and in second alternative SP wo TA steps to 4.36 and stays there. This situation creates the pattern-wise difference in depto TA and perof CE oos among the alternatives.

--o--

As Forrester also stated in 1961, the goal of explaning the behavior of a system is not sufficent. The real goal should be focused on finding management policies that will lead to superior success.

In the next chapter, raw numbers are analyzed and interpreted in a meaningful manner; which helped to identify politically viable alternatives and modifications needed for an alternative to become more acceptable and superior. Distinguishment among alternative policies will be realized, which is followed by creating new superior alternatives combining the existing ones.

CHAPTER 6

DISTINGUISHMENT AMONG ALTERNATIVE POLICIES

Evaluation of The Alternative Policies using System Dynamics Approach was the section where the impacts of the alternative policies are thoroughly examined making model analysis using many simulation runs. It gave an idea of pros and cons of each alternative; supplying information about their technical feasibility and/or political acceptability.

However, the essential point in making policy analysis is its sufficiency to distinguish between alternatives and present the policy maker a summary list of “good”s and “bad”s with each alternative. Eventually not all alternatives will be selected, the policy maker should select one according to advantages and disadvantages of alternatives.

The policies under consideration will offer different advantages and advantages with each. Some will have the greatest net benefit. Some will have a low political acceptability. Some of them will meet some of the major objectives and an other meets the others. Some alternatives will be too costly or too difficult to implement. Therefore, Policy analysis should also deal with the technical and political considerations of the alternatives, together with multiple criteria problem; which combines quantitative and qualitative data. In order to balance the conflicts between the alternatives,

all sort of evaluation criteria for the alternatives should be interpreted in a meaningful way so that superior ones between the alternatives could be obtained. Policies can be evaluated numerically or pattern-oriented.

As Patton and Sawicki (1993) stated, one of the main methods for comparing the policy alternatives numerically is transforming the costs and benefits of every alternative into dolar terms and evaluating the alternatives using this common evaluation criterion for comparison. Using this approach, tradeoffs of conflicting objectives can be measured and rejections from various groups can be minimized.

After all costs and benefits of the alternatives are converted to dollars, the general rule is selecting the alternative with highest net benefit. However, if there are budget constraints, it is not feasible to select a high cost, higher benefit alternative; but it is feasible to select the cost-effective alternative, to accomplish meet the objectives at minimum cost. Cost effectiveness analysis has nothing to do with profitability or economic efficiency of a policy. It only tries to achieve above the minimum required level of improvement in the most cheap way (Patton & Sawicki, 1993).

The value of net benefits, the ratio of benefits to costs and cost effectiveness are all useful criteria for a policy maker. In our work, all yearly benefits (B_t) are obtained for each policy alternative:

$$B_t = TYINC_{\text{action policy , t}} - TYINC_{\text{no action policy , t}}$$

However, finding out the cost of implementing some policy each year in the way mentioned is out of the scope of this work. So the distinguishment method preferred in this work is not Cost-Benefit Analysis. (A related work; using a linear cost-benefit model to spend a unified tourism policy budget on several cities is presented by Gearing, Swart,and Var, in 1973. They

estimated the costs of each policy and weighted their policy selection criteria using experts' opinions).

Other than the reason mentioned above, as Patton and Sawicki (1993) stated; the problematic part of the cost-benefit analysis is that not every cost and benefit can be measured with some amount of Money and the importance of some essential criteria may go out of sight after converting it to dollar terms.

Policy evaluation can be pattern-oriented, too; as mentioned above. **Pattern-oriented policy analysis is already more important for this study**, because the aim of system dynamics approach is to interpret and improve undesirable dynamic behavior patterns in a system. Therefore, appropriate tools such as pattern oriented comparisons and explanatory comparative tables will be used through distinguishment between alternatives.

6.1 Comparison of Existing Policies

As Patton and Sawicki (1993) also supported, in the above situation and for the case of our work, methods producing a single summary value out of a policy is not useful. Such aggregate, single denominator (like dollars) methods may cause loosing vital information, hide some assumptions, force analyst's weights for criteria on the decision maker, and may be useless to different groups of decision makers. Pattern oriented comparisons, summarizing tables and matrix display systems are generally preferred for these cases.

Therefore, Table 21; summarizing the simulation outputs of each alternative at t = 13 and Figures 19-23 comparing the dynamic patterns created by

each policy alternative on each output variable through 13 years, may be of help to transfer the quantitative policy outcomes into a policy evaluation matrix (scorecard), in which positive and negative attributes of each alternative can be summarized.

Table 21 Simulation Outputs of Each Alternative at t=13

Policies	TYINC	AMP of AF	AF qua	depto TA	perof CE oos
Initials	*347.352.642.30*	*8.074.21*	*70*	*87,4*	*80*
No Action	**319.068.265.65**	**6.372.40**	**61,46**	**90,03**	**85,8**
NAC	393.324.414.45	9.645.64	61,46	87,73	85,8
ATO	376.021.465.34	8.519.00	61,46	72,69	69,03
Unv	321.401.626.86	6.933.62	62,41	89,2	57,11
TEO - step	365.775.340.95	8.247.40	85,17	91,03	85,8
PA - linear	355.786.750.77	8.099.03	61,46	80,49	79,65
AIST	384.084.972.93	9.500.17	84,05	76,18	85,8

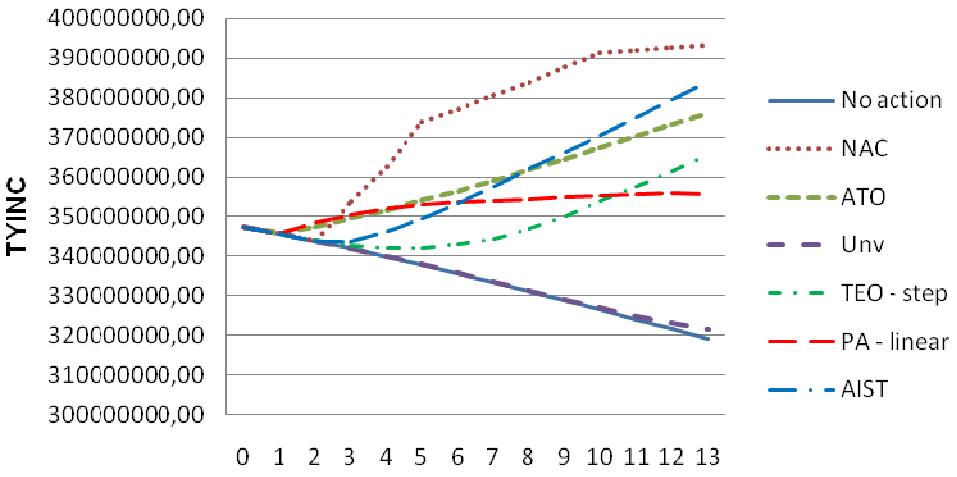

Figure 19 Comparison of Existing Policies in TYINC

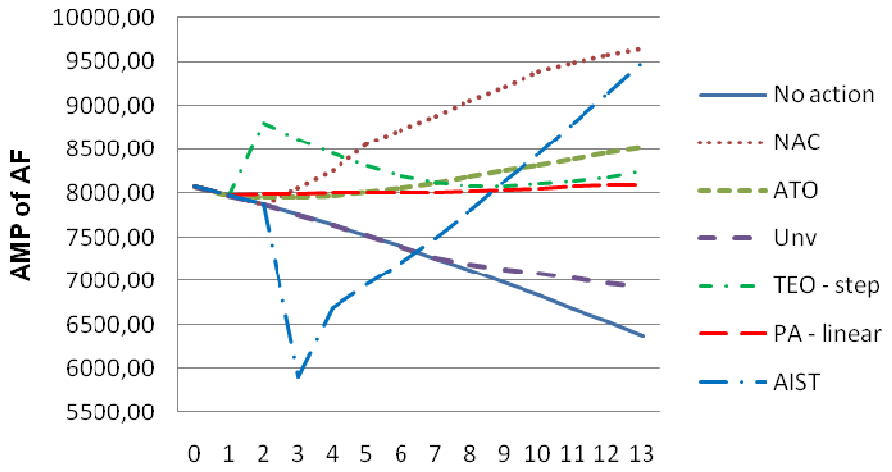

Figure 20 Comparison of Existing Policies in AMP of AF

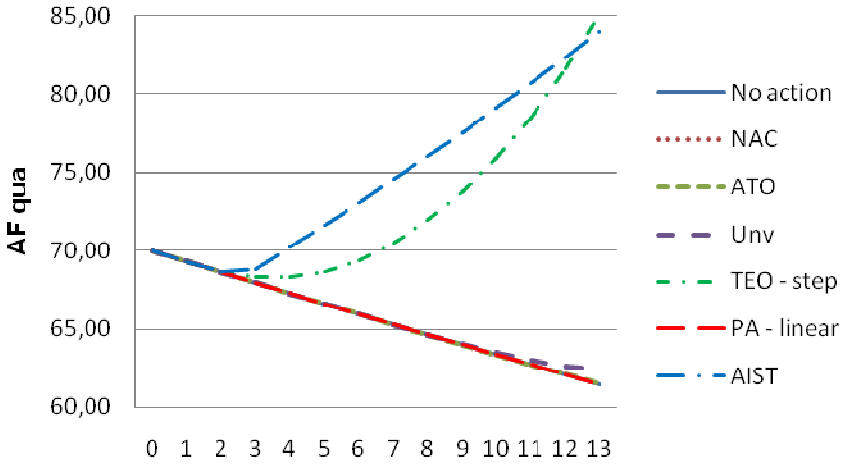

Figure 21 Comparison of Existing Policies in AF qua

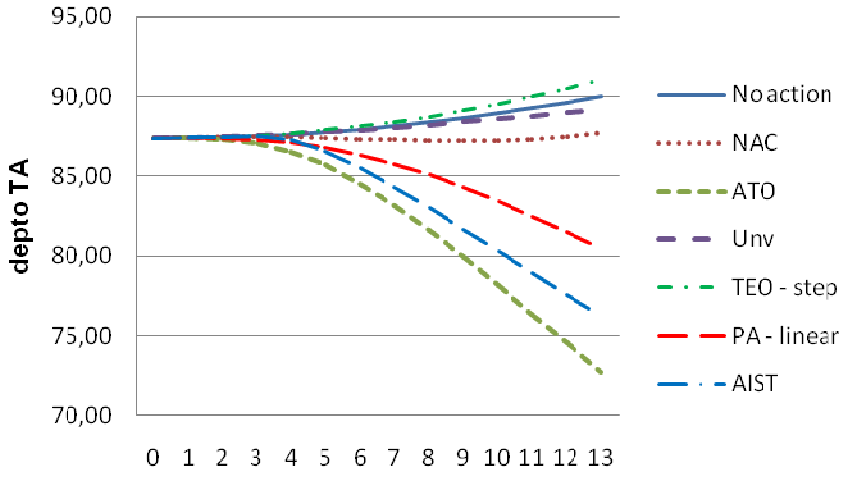

Figure 22 Comparison of Existing Policies in depto TA

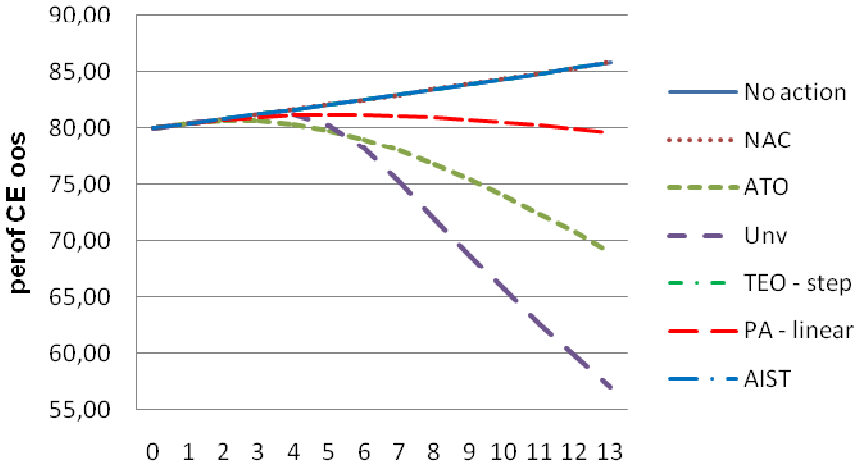

Figure 23 Comparison of Existing Policies in perof CE oos

Patton and Sawicki (1993) supported that Goeller Scorecard is one of the most useful display systems used for distinguishment among alternative policies. It describes the impacts of each alternative in “natural” units; may

be both quantitative or qualitative. Each row of the scorecard stands for one criterion and shows each alternatives performance for the given crierion. Each column stands for an alternative and shows all the impacts of the alternative. Other notations and modifications can be added to increase the meaning of the scorecard. Thus every group or individual can assign their own weights to the various criteria as they believe appropriate.

In our Goeller Scorecard for the alternatives, “level of improvements” in policy objectives are considered. This is also the suggested manner by Gupta (2001), stopping to stick on numerical outputs for the absolute elimination of the problem, but rather evaluating a program incrementally and measuring the change (improvement) that the program creates.

This ‘measuring the change’ issue for improvement evaluation brings the question of what the “reference states” will be for each objective. As clearly supported by Patton and Sawicki (1993), there are a number of reference states but accepting the no-action alternative as the reference state (rather than the “existing conditions state”) is the recommended one because it “provides the advantage of a benchmark; since it matches exactly the scenarios of the action alternatives – absent only the proposed action” (p.236).

Therefore, the Goeller Scorecard for alternative policies is filled in Table 22, accepting the no-action state as the reference state; comparing the ‘behavior’ of improvements through 13 years and ‘amount’ of improvements at t=13 in policy alternatives, with the corresponding improvements in other alternatives. Improvement comparisons in our scorecards (which are denoted by “High, Average, Low, Slight, Quick, Slow”) are simply based on subjective judgement rather than objective measurement.

Table 22 Goeller Scorecard for Alternative Policies

	POLICY	NAC			ATO			UNIV			TEO - step			PA - linear			AIST		
CRITERIA	MEASURE	Impr.	Sust.	Prom.	Impr.	Sust.	Prom.	Impr.	Sust.	Prom.	Impr.	Sust.	Prom.	Impr.	Sust.	Prom.	Impr.	Sust.	Prom.
Change in net worth	TYINC	HI	x		HI	x		SI		x	AI	x	x	AI	x		HI	x	x
Effectiveness And Adequacy	AMP of AF	HI	x		AI	x		SI		x	AI		x	AI	x		HI		x
	AF qua	NI			NI			SI		x	HI	x	x	NI			HI	x	x
	depto TA	SI			HI	x	x	SI		x	SW			AI	x	x	HI	x	x
	perof CE oos	NI			AI	x	x	HI	x	x	NI			SI		x	NI		
Acceptability	Overshoots to the minimum in AMP of AF or nof AF	HIGH			AVERAGE			LOW			AVERAGE			HIGH			LOW		
(Time) responsiveness	Speed of response of a policy on effectiveness measures	QUICK			AVERAGE			SLOW			AVERAGE			AVERAGE			AVERAGE		
Equity	Whether the policy gives all burden/windfall on certain groups or individuals	AVERAGE			HIGH			HIGH			AVERAGE			HIGH			AVERAGE		

HI : HIGH IMPROVEMENT
AI : AVERAGE IMPROVEMENT
SI : SLIGHT IMPROVEMENT
NI : NO IMPROVEMENT
SW : SLIGHTLY WORSE , COMPARING WITH BASERUN CONDITIONS AND EACH OTHER

Impr : Improving
Sust : Sustainable
Prom : Promising

The Goeller Scorecard shows all criteria having a role for selecting one alternative. As a modification to increase the meaningfulness, the table below, Table 23, makes an evaluation of these alternatives. This scorecard is a tangible proof that it is very rare that a single, “correct” policy that is acceptable to all groups involved can be found, because different groups generally have different goals and values.

Table 23 Evaluation of the Alternatives

POLICY	NAC	ATO	UNIV	TEO - step	PA - linear	AIST
Expected Cost	HIGH	HIGH	HIGH	AVERAGE	AVERAGE	LOW
Needs Improving	sustainability, promising states, AF qua, depto TA and perof CE oos variables	AF qua variable and promising states	Time response-siveness for all variables except perof CE oos	Depto TA and perof CE oos variables	AF qua, promising states of TYINC and AMP of AF	Perof CE oos variable and the political viability

As Patton and Sawicki (1993) also supported, the purpose of policy analysis is finding out some alternatives that can efficiently and effectively solve a problem, that is politically viable and feasible to implement. Also, Nagel (1987) argued that, a policy analyst should show what is need to be done to make a second or third place alternative the preffered one.

Therefore, instead of being sufficed by one of the above alternatives, the decision should be creating new and more superior alternatives. We may combine and/or fine-tune the alternatives in hand to make them more appropriate for our problem.

There are many ways to modify existing solutions to create new ones. The main options he offered were magnifying, minifying, substituting, combining and/or rearranging the existing alternatives. An alternative can also be implemented in a different location, with different timing, financing or organization. Even how the risk will be handled within each alternative can be modified too. After the possible manipulations for the alternative/alternatives are identified, we can recombine these existing advantages into competing alternatives (Patton & Sawicki, 1993).

Because analysts are not the authority to decide sufficiency or optimality of an alternative for a criterion or weight a criterion more than others carrying some sort of political attitude; “combinations of alternatives” in this work are chosen in a manner that they will create a diversity about “meeting the objectives” and avoid potential rejections to the alternatives. Manipulations in timing of the combined alternatives are made where neccessary.

6.2 Combinations of Policies

6.2.1 Increasing ATO and TEO Policy

The reason why “Increasing ATO Policy” and “Increasing TEO Policy” are combined is that they are good complements of each other meeting the objectives.

nof_ATO = GRAPH(time)
(0.00, 3.00), (1.00, 3.00), (2.00, 3.25), (3.00, 3.50), (4.00, 3.75), (5.00, 4.00), (6.00, 4.25), (7.00, 4.50), (8.00, 4.75), (9.00, 5.00), (10.0, 5.25), (11.0, 5.50), (12.0, 5.75), (13.0, 6.00)

TEO = GRAPH(time)

(0.00, 3.00), (1.00, 3.00), (2.00, 4.50), (3.00, 4.50), (4.00, 4.50), (5.00, 4.50), (6.00, 4.50), (7.00, 4.50), (8.00, 4.50), (9.00, 4.50), (10.0, 4.50), (11.0, 4.50), (12.0, 4.50), (13.0, 4.50)

As it can be observed from Figure 19, every objective is highly and smoothly improved according to its no-action state, in ATO-TEO combination. Corroborative policy outcomes can be monitored in Appendix G.

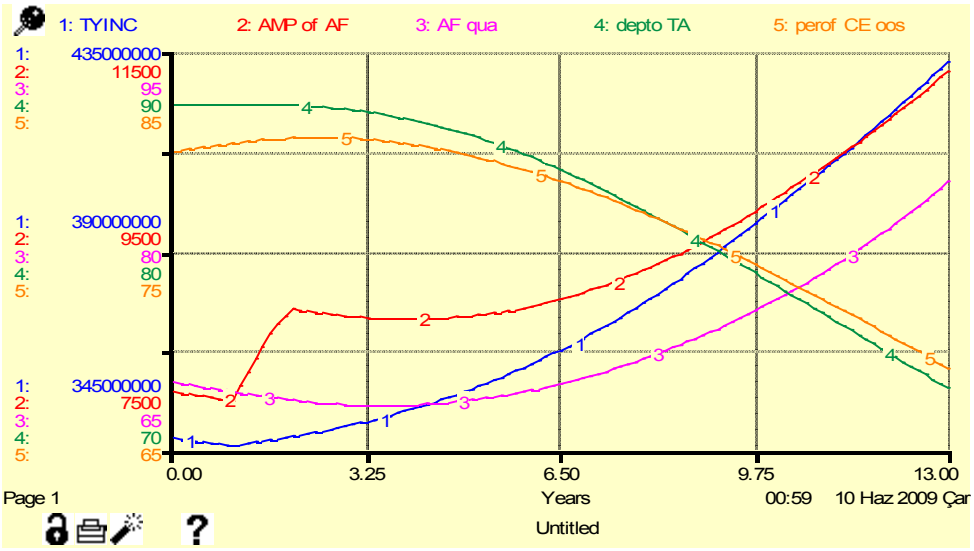

Figure 24 Outputs of Increasing ATO and TEO Policy - 1

6.2.2 NAC and Establishing AIST Policy

The purpose of combining “NAC Policy” and “Establishing AIST Policy” is that AIST is a very effective policy (except it leads no improvement for perof

CE oos) both in cost and objectives, but it is hard to implement it because of the possible displeasure it will create in the beginning of the implementation. The cure for this displeasure may be increasing the AMP of AF with NAC Policy in a rapid way in the beginning of the policy period. AIST are then established in year 6 (not in year 3), when AMP of AF is in the highest level and increased TYINC is accumulated for 3 years. This prevents many AF from closing in the beginning of the AIST Policy because AF will be more tolerable to the high NRC of AIST in this way.

NAC = GRAPH(time)
(0.00, 0.00), (1.00, 0.00), (2.00, 0.00), (3.00, 0.5), (4.00, 0.75), (5.00, 1.00), (6.00, 1.05), (7.00, 1.10), (8.00, 1.15), (9.00, 1.20), (10.0, 1.25), (11.0, 1.25), (12.0, 1.25), (13.0, 1.25)

nof_AI_ST = GRAPH(time)
(0.00, 0.00), (1.00, 0.00), (2.00, 0.00), (3.00, 0.00), (4.00, 0.00), (5.00, 0.00), (6.00, 20.0), (7.00, 20.0), (8.00, 20.0), (9.00, 20.0), (10.0, 20.0), (11.0, 20.0), (12.0, 20.0), (13.0, 20.0)

The results of this combination is observed from Figure 20. Corroborative policy outcomes can be monitored in Appendix G.

Every objective (except decreasing the percentage of closing enterprises out of season) is highly (maybe not smoothly) improved according to its no-action state. But it is important to note that, there is a tradeoff between “improving dependency to TA” and “preventing many AF to close in the beginning of the policy period”. The less the number of AF, the less the dependency to TA and the less competition between TA. That is to say, increasing the political viability of AIST Policy decreased the effectiveness of it. The fast increase of the AMP of AF and TYINC after establishing AIST is aided by the NAC Policy.

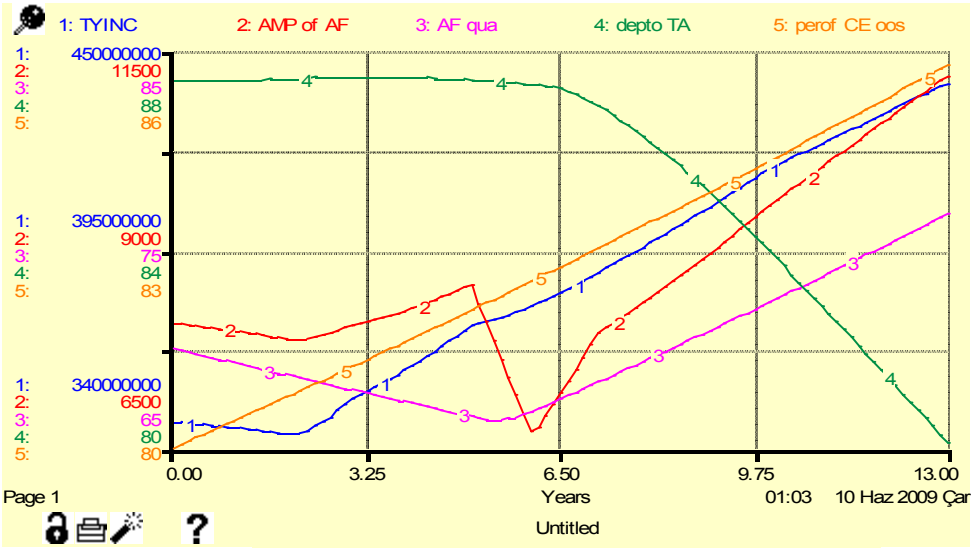

Figure 25 Outputs of NAC and Establishing AIST Policy - 1

6.2.3 Increasing PA and Constructing a Unv Policy

The purpose of combining these two policies is holding TYINC and AMP of AF above their no-action levels by more PA, until the effects of the University will become apparent in the sector. No improvement in AF quality is expected until the University will begin to affect the sector.

nof_PA = GRAPH(time)
(0.00, 3.00), (1.00, 3.00), (2.00, 3.25), (3.00, 3.50), (4.00, 3.75), (5.00, 4.00), (6.00, 4.25), (7.00, 4.50), (8.00, 4.75), (9.00, 5.00), (10.0, 5.25), (11.0, 5.50), (12.0, 5.75), (13.0, 6.00)

Unv = GRAPH(time)
(0.00, 0.00), (1.00, 0.00), (2.00, 0.00), (3.00, 0.00), (4.00, 0.25), (5.00, 0.5), (6.00, 0.75), (7.00, 1.00), (8.00, 1.00), (9.00, 1.00), (10.0, 1.00), (11.0, 1.00), (12.0, 1.00), (13.0, 1.00)

The effects of combining these two alternatives is seen in Figure 21. Corroborative policy outcomes can be monitored in Appendix G. The levels of objective variables are hold above the no-action levels of each through the policy period and even AF quality variable gained a promising pattern towards the end of policy period; as in all variables.

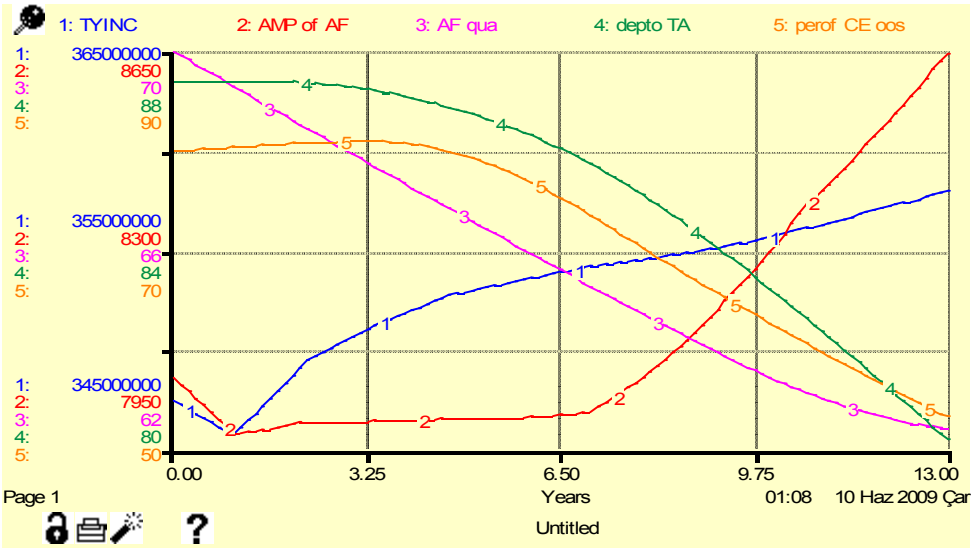

Figure 26 Outputs of Increasing PA and Constructing a Unv Policy - 1

6.2.4 Increasing ATO, NAC and Establishing AIST Policy

In NAC and AIST combination, it was pointed out that this combination has no effect on perof CE oos variable and the effectiveness of the AIST policy on depto TA variable decreased. These drawbacks can be dispelled by adding the “Increasing ATO” Policy into the combination; providing

improvement both in perof CE oos and depto TA (prolonging the seasonal period without TA, instead of lessenning the competition between AF).

nof_ATO = GRAPH(time)
(0.00, 3.00), (1.00, 3.00), (2.00, 3.25), (3.00, 3.50), (4.00, 3.75), (5.00, 4.00), (6.00, 4.25), (7.00, 4.50), (8.00, 4.75), (9.00, 5.00), (10.0, 5.25), (11.0, 5.50), (12.0, 5.75), (13.0, 6.00)

NAC = GRAPH(time)
(0.00, 0.00), (1.00, 0.00), (2.00, 0.00), (3.00, 0.5), (4.00, 0.75), (5.00, 1.00), (6.00, 1.05), (7.00, 1.10), (8.00, 1.15), (9.00, 1.20), (10.0, 1.25), (11.0, 1.25), (12.0, 1.25), (13.0, 1.25)

nof_AI_ST = GRAPH(time)
(0.00, 0.00), (1.00, 0.00), (2.00, 0.00), (3.00, 0.00), (4.00, 0.00), (5.00, 0.00), (6.00, 20.0), (7.00, 20.0), (8.00, 20.0), (9.00, 20.0), (10.0, 20.0), (11.0, 20.0), (12.0, 20.0), (13.0, 20.0)

As it can be observed in Figure 22; the alternative became a superior one technically. Corroborative policy outcomes can be monitored in Appendix G.

6.2.5 Constructing a Unv, Increasing PA and TEO Policy

In PA and Unv combination, it was clear that this combination will meet the policy objectives in a “sufficing” manner, until the promising effects of the university become apparent. In order to increase this “sufficing” pattern to a more effective one, Increasing TEO Policy can be offered along with PA and Unv Policies.

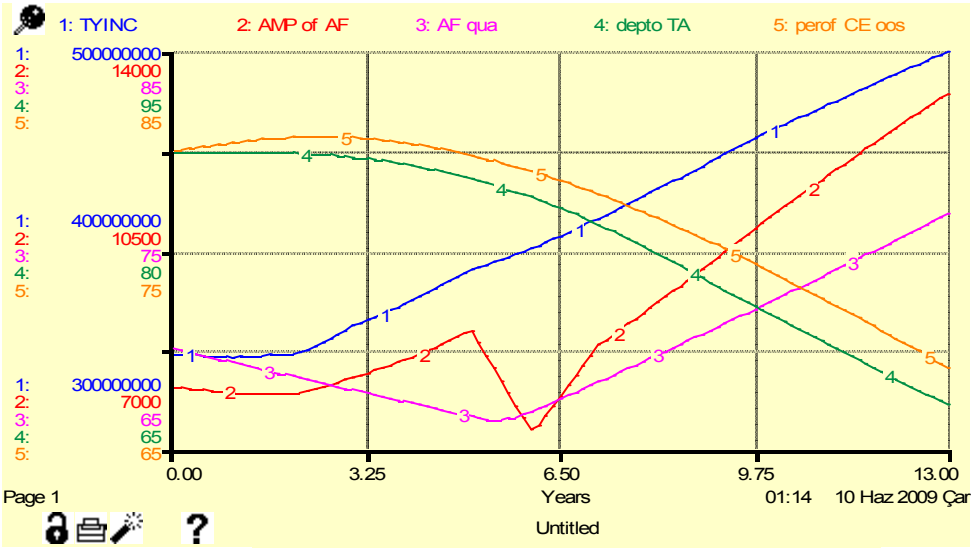

Figure 27 Outputs of Increasing ATO, NAC and Establishing AIST Policy - 1

Unv = GRAPH(time)

(0.00, 0.00), (1.00, 0.00), (2.00, 0.00), (3.00, 0.00), (4.00, 0.25), (5.00, 0.5), (6.00, 0.75), (7.00, 1.00), (8.00, 1.00), (9.00, 1.00), (10.0, 1.00), (11.0, 1.00), (12.0, 1.00), (13.0, 1.00)

nof_PA = GRAPH(time)

(0.00, 3.00), (1.00, 3.00), (2.00, 3.25), (3.00, 3.50), (4.00, 3.75), (5.00, 4.00), (6.00, 4.25), (7.00, 4.50), (8.00, 4.75), (9.00, 5.00), (10.0, 5.25), (11.0, 5.50), (12.0, 5.75), (13.0, 6.00)

TEO = GRAPH(time)

(0.00, 3.00), (1.00, 3.00), (2.00, 4.50), (3.00, 4.50), (4.00, 4.50), (5.00, 4.50), (6.00, 4.50), (7.00, 4.50), (8.00, 4.50), (9.00, 4.50), (10.0, 4.50), (11.0, 4.50), (12.0, 4.50), (13.0, 4.50)

Figure 23 shows that adding PA into the combination made this alternative a superior one, too; being more effective for policy period, but absolutely promising for the future. Corroborative policy outcomes can be monitored in Appendix G.

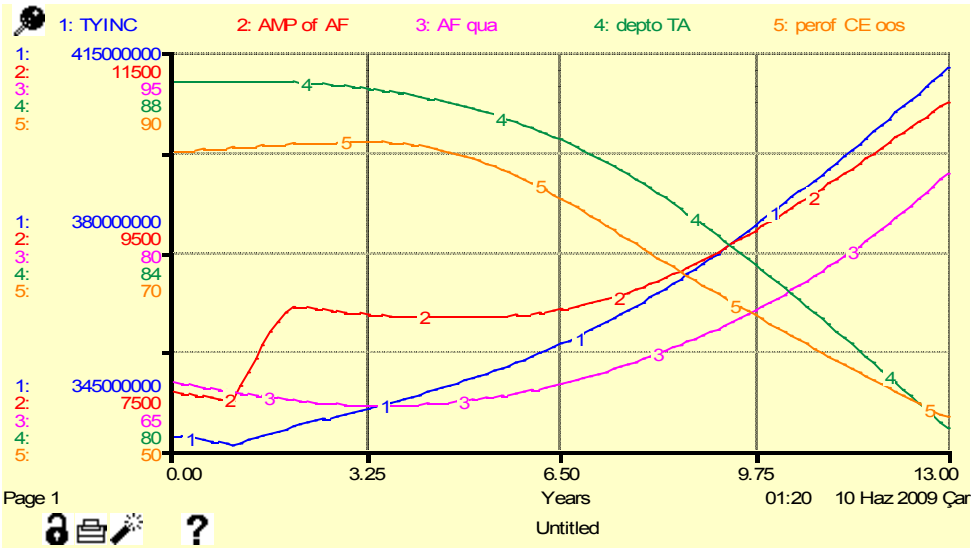

Figure 28 Outputs of Constructing a Unv, Increasing PA and TEO Policy - 1

6.3 Comparison of Superior Policies

According to the analysis of the policy combinations made above, a summarizing table of simulation outputs of each combination at t=13 is given in Table 24 and dynamic patterns created by each policy alternative on each output variable through 13 years are compared in Figures 29-33.

Table 24 Simulation Outputs of Combined Alternatives at t=13

Years	TYINC	AMP of AF	AF qua	depto TA	perof CE oos
Initials	*347.352.642.30*	*8.074.21*	*70*	*87,4*	*80*
No Action	**319.068.265.65**	**6.372.40**	**61,46**	**90,03**	**85,8**
ATO + TEO	432.663.091.68	11.300.23	85,17	73,03	69,03
NAC + AIST	441.119.444.75	11.190.56	76,82	80,1	85,8
PA + Unv	357.996.448.27	8.646.69	62,41	80,16	53,12
AIST + NAC + ATO	499.930.059.20	13.250.08	76,82	68,26	69,03
UNIV + PA + TEO	412.240.199.63	11.002.91	85,85	80,41	53,12

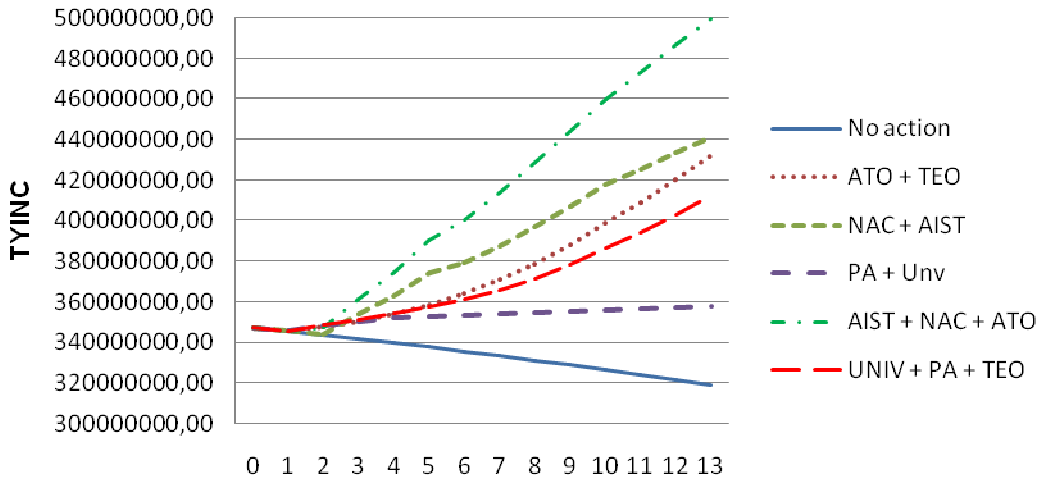

Figure 29 Comparison of Superior Policies in TYINC

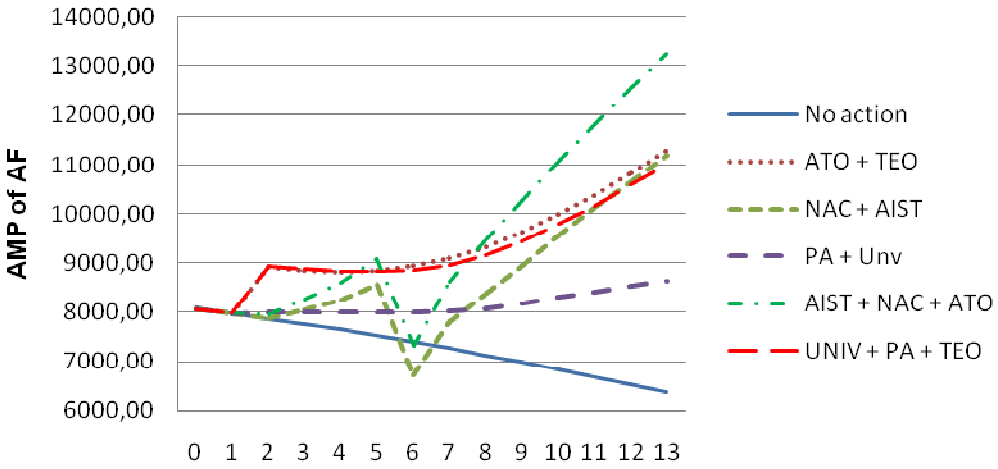

Figure 30 Comparison of Superior Policies in AMP of AF

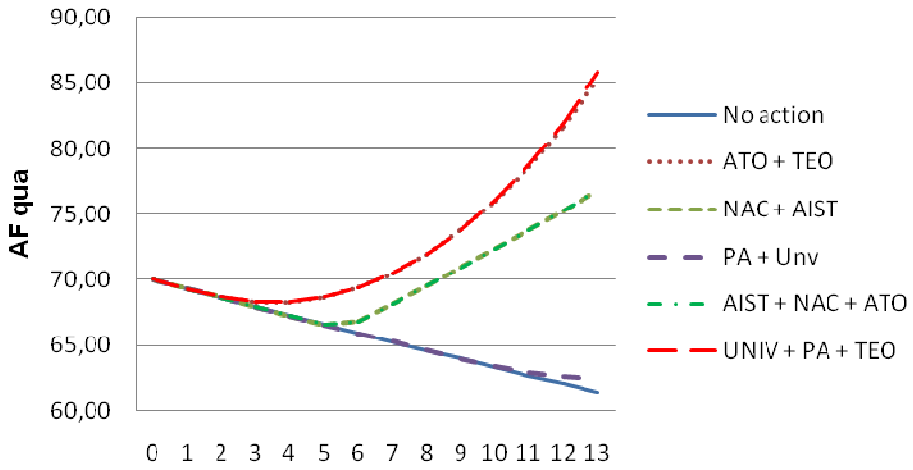

Figure 31 Comparison of Superior Policies in AF qua

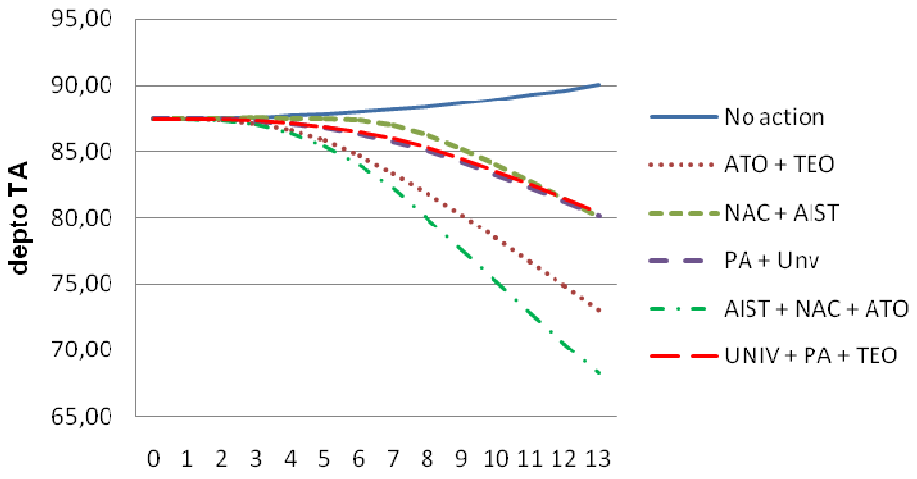

Figure 32 Comparison of Superior Policies in depto TA

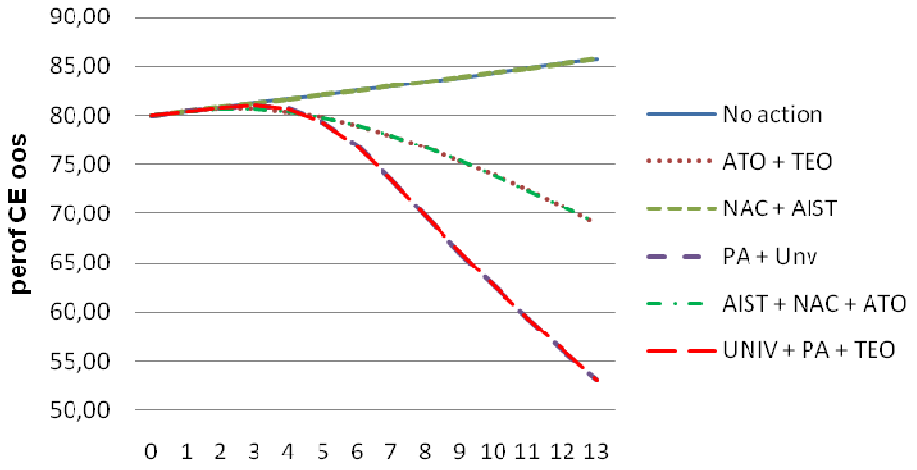

Figure 33 Comparison of Superior Policies in perof CE oos

The Goeller Scorecard for alternative combinations is shown in Table 25, again accepting the no-action state as the reference state, and comparing the amounts of improvements in each objective of each alternative relative to the corresponding improvement in other alternatives.

Table 25 Goeller Scorecard for Combined Policies

	POLICY	ATO + TEO			NAC + AIST			PA + UNIV			AIST + NAC + ATO			UNIV + PA + TEO		
CRITERIA	MEASURE	Impr.	Sust.	Prom.	Impr.	Sust.	Prom.	Impr.	Sust.	Prom.	Impr.	Sust.	Prom.	Impr.	Sust.	Prom.
Change in net worth	TYINC	AI	x	x	AI	x	x	SI	x	x	HI	x	x	AI	x	x
Effectiveness And Adequacy	AMP of AF	AI	x	x	AI	x	x	SI	x	x	HI	x	x	AI	x	x
	AF qua	HI	x	x	AI	x	x	SI		x	AI	x	x	HI	x	x
	depto TA	AI	x	x	SI	x	x	SI	x	x	HI	x	x	SI	x	x
	perof CE oos	AI	x	x	NI			HI	x	x	AI	x	x	HI	x	x
Acceptability	Overshoots to the minimum in AMP of AF or nof AF	HIGH			AVERAGE			HIGH			AVERAGE			HIGH		
(Time) responsiveness	Speed of response of a policy on effectiveness measures	QUICK			AVERAGE			AVERAGE			AVERAGE			QUICK		
Equity	Whether the policy gives all burden/windfall on certain groups or individuals	HIGH			AVERAGE			HIGH			HIGH			HIGH		

HI : HIGH IMPROVEMENT
AI : AVERAGE IMPROVEMENT
SI : SLIGHT IMPROVEMENT
NI : NO IMPROVEMENT
SW : SLIGHTLY WORSE , COMPARING WITH BASERUN CONDITIONS AND EACH OTHER

Impr : Improving
Sust : Sustainable
Prom : Promising

Rarely the criteria are equal in importance. In the evaluation of alternatives, which criteria are important for which groups is an important parameter to measure the satisfaction of the groups by alternative policies (Patton & Sawicki, 1993). Determination of the relative importance of evaluation criteria is called “weighting the criteria”.

One can think that scorecard above may be improved by weighting the criteria on it. This “weighting” option is not used (also not suggested) through this work thinking that it will probably not reflect the values of a policy maker, together with the political or budgetary constraints s/he will have and some “important for the policy maker” information (strengths and weaknesses of the alternatives) may be lost due to an aggregation. Therefore, “weighting the criteria” (together with “selecting the most appropriate alternative”) is a political process “best left to the politicians” (Patton & Sawicki, 1993, p. 356).

The important point to show in this work is that System Dynamics Approach is an effective tool both for analyzing the dynamic behaviour of Local Sectoral Systems and for carrying out a Policy Analysis process on the subject.

CHAPTER 7

CONCLUSION

The aim of this thesis was pointing out that System Dynamics approach would be an appropriate tool for analysis of policies suggested for “local sectors”; which are region-specific, complex and dynamic systems. The related work is carried out for the case of Alanya Tourism Sector.

The study started with claiming how sectors perspective together with localities viewpoint can be useful for finding out best local sectoral development policies. Through the related chapters, it is shown that sectors can not be thought seperately from their localities, which bring them the related sectoral factors and inter-locational advantages. Many sectors are identified ‘local’ in scale, and local sectoral policies are investigated specifically. For the case of this work, tourism sector is chosen as the ‘local’ sector to analyze, which seems like a global scale sector at first (due to its definition), but is a local sector in real, due to the fact that factors and policy means that will create sustainable development and competitive advantage for a tourism destination are mostly local.

Problem Statement for Alanya Tourism Sector, list of evaluation criteria and measures for alternative policies, and the policy alternatives themselves are iteratively discussed through the thesis preparation process. They originated the ideas that guided all System Dynamics steps next; used for

policy evaluation. However, System Dynamics discipline itself, aided to re-shape all previously established problem statements, criteria, alternatives, and also itself through policy evaluation over and over again, thanks to its 'systems perspective'. Through this many iterations of the policy steps and this many runs on system dynamics model, the model gained high robustness under extreme conditions and leaded high quality outputs of system behavior.

For the greater context, System Dynamics is found to be a versatile tool that can address the systemic causes under endogenous problems of local sectors and go along all related policy analysis steps. Basing on 'systems perspective', the methodology was useful both for qualitative and quantitative description of systems, simulation of models and presentation of possible outcomes under certain conditions and policies.

Running the model with available policies, Stella 9.0.1 aided to display the results of the policies in terms of criteria measures. Graphs showing dynamics of the most important sector variables and tables giving the numerical values of the outputs as a function of time; gave deep insight into "what should be done to fix what". They served to make clear distinguishments among alternatives and create new combinations from existing ones using prior insight.

The advantage of using system dynamics in making policy analysis is the approach's ability to project complex system mechanisms into versatile models. Depending on your goal of policy making and policy envelope, one can define a variable a stock, a flow, an auxiliary and investigate its behavior accordingly. If one desires to have more detailed analysis for one module, detailing the related part of System Dynamics model is easy. The approach has advantages through System Dynamics approach 'process', too. As one dives into the relations between variables and their

mathematical meanings, the related model boundary and assumptions becomes evident through the process. Thus, policy analysis become a quicker and practical tool for users. System Dynamics approach has drawbacks for policy analysis, too. System dynamics models tie many issues to subjective opinion originating from the modeler or the secondary sources like interviewees. For this reason, the resulting model can show policy sensitivity in some output variables, as in the case of wwo_TA_ind, caused by equation definition of the modeler; and as in the case of effect formulations; mostly originated by interviewees. In our model, the results are mostly robust, except these points.

Plenty of complex technical and economic relations in local sectoral systems, specifically in Alanya Tourism Sector, makes the structure sophisticated to model. The abstractions and assumptions made during the model construction of Alanya Tourism Sector *may* result in inconsistencies in some runs. If so, further research on related parameters is suggested, relaxing the assumptions accordingly. However, as Coleman (1975) said: “For policy research, results that are with high certainty approximately correct are more valuable than results which are more elegantly derived but possibly grossly incorrect” (p.23).

Many nonlinear functions revealing the effects of variables on another complicated the projection of these relations. The relations are obtained from literature surveys and interviews, and implemented in the model together with some initial values and ‘normal’ values of variables. Obtaining this number of data from interviews -but primarily sorting for them from the literature- was a heavy task, together with the effort to prove their validity and reliability.

On the basis of all work realized as explained above and in spite of the existance of all difficulties, the research was successful and System

Dynamics discipline is shown to be a competent tool to analyze local sectoral policies.

Recommendations can be drawn from this work for policy makers and participants of tourism sector.

Firstly, Pushing up a single policy variable is seldom enough to solve all problems in a local sector. None of a policy can satisfy all criteria to the highest extent. Therefore, the key point to success in policy making will be making policy analysis to *distinguish* between alternatives. After this is done the policy maker can weight the selection criteria and find the most appropriate one/s on his/her own, depending on the values of different power groups.

Secondly, being a direct conclusion drawn from the outputs of simulation runs, it looks impossible to assure long term sustainability without increasing the quality aspect of tourism activities. From this point of view; NAC and Increasing PA type of policy alternatives alone are not enough for sustainable tourism. These policies can contribute to tourism income of a locality for a couple of years, but they can not assure sustainability because they have negligible contribution to sectoral quality. From some point on in time, number of tourists (being the major sustainable tourism indicator) would begin to decline due to this fact, as in the case of our simulation runs.

Trying to establish a level of quality in tourism sector is not a quick responding policy in general. Or, quick responding ones, as in the case of Establishing AIST policy, has some overshoots to minimum which decrease the political viability of the alternatives. This is a tradeoff to decide.

As Patton and Sawicki (1993) strongly suggested, an analyst should “give the client analysis, not decisions” (p.16). That is to say, weighting the criteria should be left to the politician, too; as in the case of this work.

In conclusion, this work showed that System Dynamics method is a proper tool to analyze local sectoral policies. A step-by-step policy analysis is carried out on Alanya Tourism Sector using System Dynamics as the method to evaluate alternative policies and re-evaluate all policy analysis steps. Alternative policies for Alanya Tourism Sector are analyzed through the process, but the decision is left to the related individuals drawing their own conclusions. The sectoral model, together with distinguishment among possible alternatives is an output of this work that can be used by policymakers, tourism facilities and related power groups.

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APPENDIX A

LIST OF DATA FOUND OR CALCULATED

- The following are the data found from Chapter 3 or, calculated depending on it and the assumptions made above.

INIT depto_TA = 87.4

Table X in Tourist Profile Research in Chapter 3 shows that 87.4 percent of tourists come to Alanya for holiday tourism (TAI). The rest (TATO) comes for health, business/conferences, sports or cultural tourism (Which are Alternative Tourism Opportunities in Alanya) In the assumptions above, it is assumed that “nof TAI not using TA to organize their holidays are negligible”. Therefore, all TAI use TA and dependency of AF to TA is also 87.4 % in Alanya. This data is consistent with Table Y, saying that 88.3 percent of tourists coming to Alanya use TA to organize their holidays. Nevertheless, we will use 87.4 as the basis for our simulation calcuations, for the sake of consistency with our assumptions.

INIT nof_AF = 717

In 2007, there were 717 AF in Alanya in total (Table Y).

N_SP_wo_TA = 4

N_SP_w_TA = 7

Seasonal periods of Alanya with and without TA are inferred using Table X in Chapter 3. According to this table, 4 months (June, July, August, September) would be dominant in Alanya Tourism Sector as in Antalya, with more than 1 000 000 foreign visitors each month. That is to say, Seasonal Period of Alanya without TA can be said as 4 months. There is an average number of tourists coming to Antalya in April, May and October, too; probably organized by TA's. Thus, Seasonal Period of Alanya with TA can be assumed as 7, as in the case of Antalya.

DS = 9.91

Average stay period (Duration of Stay) of foreign tourists in Alanya in 2007 (9.91 days) is accepted as the average stay period of all tourists (Table Z).Depending on historical data, it is assumed to be constant through a policy period.

N_nof_ATO = 3

Normal nof ATO in Alanya is assumed to be (mainly) 3 in Alanya: Health, cultural-historical and sports tourism (examining Chapter 3 of this work).

N_nof_PA = 3

Normal nof PA in Alanya is assumed to be (mainly) 3 in Alanya, depending on Table X of Chapter 3: PA carried out on internet, using media (TV, radios, magazines, newspapers) and distributing brochures and catalogs. PA via TA is considered by a different auxiliary named PR_of_TA_fr_AO, and recommendations from friends are considered by AF_qua concept.

N_TEO = 3

TEO in Alanya are assumed to be (mainly) 3: Akdeniz University Alanya Faculty of Business Administration, Akdeniz University ALTSO Alanya Vocational School of Higher Education and ALTSO Educational Activities (examining Chapter 3 of this work).

- Some ‘normal values of auxiliaries’ are the same with the initial values of their stock counterparts in the model (which are obtained by literature surveys or structured interview results).

N_AF_qua = 70
N_AP_fby_TA = 20
N_nof_AF = 717
N_perof_CE_oos = 80
N_perof_QE = 50

- Values of policy variables in status-quo (i.e; no-action conditions) are drawn from Chapter 3. Some of them are same with ‘normal values of (corresponding) auxiliaries’.

nof_ATO = 3
nof_PA = 3
NAC = 0
nof_AI_ST = 0
TEO = 3
Unv = 0

- Some ‘normal values of auxiliaries’ are implemented as same with the calculated values of the corresponding auxiliaries, in the no-action simulation run, at t=0.

N_AMP_of_AF = 8074.21
N_wwo_TA_ind = 5.55

- Some ‘normal values of auxiliaries’ are calculated such that they will be compatible with other auxiliary variables (which are obtained by literature surveys or structured interview results).

N_nof_TAI = 1484940.858
N_nof_int_TAI = 1649934.287
N_nof_TATO = 214076.142
These three ‘normal’ values are calculated by estimating the number of all tourists coming to Alanya in 2007 as 1 699 017 (using the structured interview results mentioned below) and knowing that 87.4 percent of all tourists are TAI and N_PR_of_TA_fr_AO is 0.9.

APPENDIX B

LIST OF INTERVIEWEES

Table 26 List of Interviewees

	Interviewees	Power Group or Activities Represented	Related Establishments
1	Arif Tok	Publicity Activities and Project Management	(EU Consultant ve Project Manager in) Alanya Municipality
2	Cihan Baba	Education, Transportation	Manager of) Alanya Özel Bahçeşehir Koleji, (General Coordinator of) ALİDAŞ
3	Hüseyin Gümrükçüler	Beverage Enterprices, Publicity Activities	(Owner of) Alanya RedTower Brewery
4	İlhami Yetkin	Natural Tourism, Natural Sports	(Chairman of) AFSAK, (Manager of) ALDOSK, (Employee in) Alanya Municipality Culture Center
5	Kemal Kaçmaz	Politicians, Merchants	(County Commissioner of) A Political Party, (Chairman of) CLAM and TYMSIB
6	Mustafa Kamburoğlu	Food Enterprices	(Owner of) Alanya Özsüt
7	Nimet Bolat	Sustainable Development, Publicity Activities	(Employee in) Alanya Municipality Press and Public Relations, (Member of) Alanya City Council
8	Oytun Kan	Accomodation Facilities and Construction Activities	(Owner of) Yalıhan Hotel, A Real Estate Agency
9	Seher Türkmen	Cultural Tourism	(Manager of) Alanya Museum
10	Tanel Kökdemir	Tradesmen	(Owner of) Alanya Dolphin Deri ve Tekstil Giyim, (Member of) ALTSO 3. Profession Committee
11	Zeynep Öçten	Publicity Activities, Intermediaries	(Employee in) Alanya Municipality Public Relations and Tourism, (Member of) ALTAV, (Member of) Alanya Youth Platform
12	Zeynep Özbek	Accomodation, Intermediaries	(Chairman of) Alanya Sinematek, (Owner of) Blue Sky Hotel

APPENDIX C

STRUCTURED INTERVIEW SCHEDULE

Table 27 Structured Interview Schedule – 1

No	Soru *	
1	Sizce, 2007 yılı içinde,	Alanya'daki Konaklama Tesislerinin ortalama kalitesi "yüz üzerinden" kaçtır?
2		Seyahat Acenteleri, Alanya'daki Konaklama Tesisleri'yle kişi başı günlük Herşey Dahil Konaklama için kaç Euro'ya anlaşmışlardır?
3		Alanya'daki işletmelerin yüzde kaçı, sezon dışında kapalı veya atıl vaziyettedir?
4		Alanyadaki Konaklama Tesislerinde çalışan vasıflı eleman yüzdesi kaçtır?
5	"Normalde" (yani, Alanya Turizm Sektöründeki dinamikler mevcut şekliyle kalırsa),	Konaklama Tesislerinin kalitesi her yıl "bir önceki yıldaki değerinin" % kaçı kadar artar/azalır?
6		Seyahat Acentelerinin, Alanya'daki Konaklama Tesisleri'ne teklif ettiği kişi başı günlük Herşey Dahil Konaklama fiyatları her yıl "bir önceki yıldaki değerinin" % kaçı kadar artar/azalır?
7		Konaklama tesislerinin Seyahat Acenteleri'nce rezerve edilen odalarının yüzdesi her yıl "bir önceki yıldaki değerinin" % kaçı kadar artar/azalır?
8		Alanya'da mevcut konaklama tesislerinin sayısı her yıl "bir önceki yıldaki değerinin" % kaçı kadar artar/azalır?
9		Alanya'da sezon dışında kapalı veya atıl vaziyette kalan işletmelerin yüzdesi her yıl "bir önceki yıldaki değerinin" % kaçı kadar artar/azalır?
10		Alanyadaki Konaklama Tesislerinde çalışan vasıflı eleman yüzdesi her yıl "bir önceki yıldaki değerinin" % kaçı kadar artar/azalır?
11		Alanya'daki Konaklama Tesisleri'nin kişi başı günlük Herşey Dahil Konaklama için uygulamak istedikleri fiyat ne olur? (Euro Cinsinden)

Table 27 (continued)

12		Alanya'ya bir yıl içinde kaç turist gelir (Yerli/Yabacı, Yaz turizmi amaçlı/Alternatif Turizm Amaçlı) ?
13		Seyahat Acentelerinin Alanya'dan elde ettikleri kişi başı günlük kar / Başka Turizm Merkezlerinden elde ettikleri kişi başı günlük kar oranı kaç olur?
14		Konaklama Tesislerinde, günlük turist başı yapılan harcama içinde, çalışan ücreti için kaç Euro ayrılır?**
15		Alanya Turizm Sektöründeki vasıflı eleman arz / talebi ne olur?
16		Alanya'da Konaklama Tesisi yatak kapasitesi arz / talebi oranı kaç olur?
17	Sizce (ortalamada),	Herşey Dahil Standartları uygulanmaya başlarsa, ilk 1 yıl boyunca bu standartların konaklama tesislerine aylık (tekrarlanmayan) maliyeti Standart başına kaç Euro'dur? (ortalama 20 adet kapsamlı standart geldiğini düşününüz)
18		Konaklama Tesislerinde, günlük turist başı yapılan harcama içinde, 'Diğer Giderler' için kaç Euro ayrılır?**
19		Herşey Dahil Standartları uygulanmaya başlarsa, ileriki yıllar boyunca bu standartların konaklama tesislerine günlük turist başı maliyeti Standart başına kaç Euro olur?** (ortalama 20 adet kapsamlı standart geldiğini düşününüz)
		* "Yüzde"li (%) şekilde sorulan sorular "binde"li şekilde de yanıtlanabilir.
		** Günlük turist başı yapılan harcama içinde, çalışan ücreti payı, (varsa) Herşey Dahil standartlarına uyumu sürdürebilme payı ve 'Diğer Giderler' payı var sayılmıştır.

Table 28 Structured Interview Schedule – 2

No	Soru *				
20	2007'den itibaren 13 sene süresince,	**Alanyadaki konaklama tesislerinin ortalama aylık karı**		"normal"inin en fazla kaç katına	inebilir?
21					çıkabilir?
22	**Alanyadaki konaklama tesislerinin ortalama aylık karı**	artıp azaldığında	**Alanyadaki Konaklama Tesislerinin Sayısı**	nasıl değişir? (doğru/ters orantı, hızlı/yavaş, lineer/nonlineer)	
23		minimum seviyesinde iken		her yıl "bir önceki yıldaki değerinin" en fazla % kaçı kadar artabilir/azalabilir?	
24		maximum seviyesinde iken			

Table 28 (continued)

25	2007'den itibaren 13 sene süresince,	**Yaz turizmi için gelen turist sayısı**		"normal"inin en fazla kaç katına	inebilir?
26					çıkabilir?
27	**Yaz turizmi için gelen turist sayısı**	artıp azaldığında	**Seyahat Acenteleri'nin, Konaklama Tesisleri'yle kişi başı günlük Herşey Dahil Konaklama için anlaştıkları fiyat**	nasıl değişir? (doğru/ters orantı, hızlı/yavaş, lineer/nonlineer)	
28		minimum seviyesinde iken		her yıl "bir önceki yıldaki değerinin" en fazla % kaçı kadar artabilir/azalabilir?	
29		maximum seviyesinde iken			
30	2007'den itibaren 13 sene süresince,	**Alanyadaki Konaklama Tesislerinde çalışan vasıflı eleman yüzdesi**		"normal"inin en fazla kaç katına	inebilir?
31					çıkabilir?
32	**Alanyadaki Konaklama Tesislerinde çalışan vasıflı eleman yüzdesi**	artıp azaldığında	**Alanyadaki Konaklama Tesislerinin Kalitesi**	nasıl değişir? (doğru/ters orantı, hızlı/yavaş, lineer/nonlineer)	
33		minimum seviyesinde iken		her yıl "bir önceki yıldaki değerinin" en fazla % kaçı kadar artabilir/azalabilir?	
34		maximum seviyesinde iken			
35	2007'den itibaren 13 sene süresince,	**Konaklama Tesislerinde, günlük turist başı yapılan harcama içinde, çalışan ücreti için ayrılan miktar**		"normal"inin en fazla kaç katına	inebilir?
36					çıkabilir?
37	**Konaklama Tesislerinde, günlük turist başı yapılan harcama içinde, çalışan ücreti için ayrılan miktar**	artıp azaldığında	**Alanyadaki Konaklama Tesislerinde çalışan vasıflı eleman yüzdesi**	nasıl değişir? (doğru/ters orantı, hızlı/yavaş, lineer/nonlineer)	
38		minimum seviyesinde iken		her yıl "bir önceki yıldaki değerinin" en fazla % kaçı kadar artabilir/azalabilir?	
39		maximum seviyesinde iken			
40	2007'den itibaren 13 sene süresince,	**Alanya Turizm Sektörü için, Seyahat Acentelerine bağımlı kalarak yaşanan "sezon süresi" (W) ile Seyahat Acenteleri olmadan yaşanabilecek "sezon süresi" (WO) arasındaki oran**		"normal"inin en fazla kaç katına	inebilir?
41					çıkabilir?
42	**Alanya Turizm Sektörü için, Seyahat Acentelerine bağımlı kalarak yaşanan "sezon süresi" (W) ile Seyahat Acenteleri olmadan yaşanabilecek "sezon süresi" (WO) arasındaki oran**	artıp azaldığında	**Konaklama tesislerinin Seyahat Acenteleri'nce rezerve edilen odalarının yüzdesi**	nasıl değişir? (doğru/ters orantı, hızlı/yavaş, lineer/nonlineer)	
43		minimum seviyesinde iken		her yıl "bir önceki yıldaki değerinin" en fazla % kaçı kadar artabilir/azalabilir?	
44		maximum seviyesinde iken			

Table 28 (continued)

45	2007'den itibaren 13 sene süresince,	**Alanya Turizm Sektörü için, (Seyahat Acentelerine bağımlı kalarak yaşanan) "sezon süresi" (W)**		"normal"inin en fazla kaç katına	inebilir?
46					çıkabilir?
47	**Alanya Turizm Sektörü için, (Seyahat Acentelerine bağımlı kalarak yaşanan) "sezon süresi" (W)**	artıp azaldığında	**Sezon dışında kapalı veya atıl vaziyette kalan işletme yüzdesi**	nasıl değişir? (doğru/ters orantı, hızlı/yavaş, lineer/nonlineer)	
48		minimum seviyesinde iken		her yıl "bir önceki yıldaki değerinin" en fazla % kaçı kadar artabilir/azalabilir?	
49		maximum seviyesinde iken			
50	2007'den itibaren 13 sene süresince,	**Alanya'da Konaklama Tesisi yatak kapasitesi arz / talep oranı**		"normal"inin en fazla kaç katına	inebilir?
51					çıkabilir?
52	**Alanya'da Konaklama Tesisi yatak kapasitesi arz / talep oranı**	artıp azaldığında	**Konaklama tesislerinin Seyahat Acenteleri'nce rezerve edilen odalarının yüzdesi**	nasıl değişir? (doğru/ters orantı, hızlı/yavaş, lineer/nonlineer)	
53		minimum seviyesinde iken		her yıl "bir önceki yıldaki değerinin" en fazla % kaçı kadar artabilir/azalabilir?	
54		maximum seviyesinde iken			
55	2007'den itibaren 13 sene süresince,	**Alanya Turizm Sektörü için, Seyahat Acentelerine bağımlı kalarak yaşanan "sezon süresi" (W) ile Seyahat Acenteleri olmadan yaşanan "sezon süresi" (WO) arasındaki oran**		"normal"inin en fazla kaç katına	inebilir?
56					çıkabilir?
57	**Alanya Turizm Sektörü için, Seyahat Acentelerine bağımlı kalarak yaşanan "sezon süresi" (W) ile Seyahat Acenteleri olmadan yaşanan "sezon süresi" (WO) arasındaki oran**	artıp azaldığında	**Konaklama tesislerinin Seyahat Acenteleri'nce rezerve edilen odalarının yüzdesi**	nasıl değişir? (doğru/ters orantı, hızlı/yavaş, lineer/nonlineer)	
58		minimum seviyesinde iken		her yıl "bir önceki yıldaki değerinin" en fazla % kaçı kadar artabilir/azalabilir?	
59		maximum seviyesinde iken			
60	2007'den itibaren 13 sene süresince,	**Alanyadaki Konaklama Tesislerinin Kalitesi**		"normal"inin en fazla kaç katına	inebilir?
61					çıkabilir?
62	**Alanyadaki Konaklama Tesislerinin Kalitesi**	artıp azaldığında	**Alanya'daki Konaklama Tesisleri'nin kişi başı günlük Herşey Dahil Konaklama için uygulamak istedikleri fiyat**	nasıl değişir? (doğru/ters orantı, hızlı/yavaş, lineer/nonlineer)	
63		minimum seviyesinde iken		her yıl "normal"inin en fazla % kaçı kadar artabilir/azalabilir?	
64		maximum seviyesinde iken			

Table 28 (continued)

65	2007'den itibaren 13 sene süresince,	**Alanyadaki Konaklama Tesislerinin Kalitesi**		"normal"inin en fazla kaç katına	inebilir?
66					çıkabilir?
67	**Alanyadaki Konaklama Tesislerinin Kalitesi**	artıp azaldığında	**yaz turizmi için Alanya'ya gelmek isteyenlerin sayısı**	nasıl değişir? (doğru/ters orantı, hızlı/yavaş, lineer/nonlineer)	
68		minimum seviyesinde iken		her yıl "normal"inin en fazla % kaçı kadar artabilir/azalabilir?	
69		maximum seviyesinde iken			
70	2007'den itibaren 13 sene süresince,	**Seyahat Acenteleri'nin, Konaklama Tesisleri'yle kişi başı günlük Herşey Dahil Konaklama için anlaştıkları fiyat**		"normal"inin en fazla kaç katına	inebilir?
71					çıkabilir?
72	**Seyahat Acenteleri'nin, Konaklama Tesisleri'yle kişi başı günlük Herşey Dahil Konaklama için anlaştıkları fiyat**	artıp azaldığında	**Seyahat Acentelerinin Alanya'dan elde ettikleri kişi başı günlük kar / Başka Turizm Merkezlerinden elde ettikleri kişi başı günlük kar oranı**	nasıl değişir? (doğru/ters orantı, hızlı/yavaş, lineer/nonlineer)	
73		minimum seviyesinde iken		her yıl "normal"inin en fazla % kaçı kadar artabilir/azalabilir?	
74		maximum seviyesinde iken			
75	2007'den itibaren 13 sene süresince,	**Alanyadaki Konaklama Tesislerinin Sayısı**		"normal"inin en fazla kaç katına	inebilir?
76					çıkabilir?
77	**Alanyadaki Konaklama Tesislerinin Sayısı**	artıp azaldığında	**Alanya'da Konaklama Tesisi yatak kapasitesi arz / talep oranı**	nasıl değişir? (doğru/ters orantı, hızlı/yavaş, lineer/nonlineer)	
78		minimum seviyesinde iken		her yıl "normal"inin en fazla % kaçı kadar artabilir/azalabilir?	
79		maximum seviyesinde iken			
80	2007'den itibaren 13 sene süresince,	**bir yıl içinde Alanya'ya gelen toplam turist sayısı**		"normal"inin en fazla kaç katına	inebilir?
81					çıkabilir?
82	**bir yıl içinde Alanya'ya gelen toplam turist sayısı**	artıp azaldığında	**Alanya'da Konaklama Tesisi yatak kapasitesi arz / talep oranı**	nasıl değişir? (doğru/ters orantı, hızlı/yavaş, lineer/nonlineer)	
83		minimum seviyesinde iken		her yıl "normal"inin en fazla % kaçı kadar artabilir/azalabilir?	
84		maximum seviyesinde iken			
85	2007'den itibaren 13 sene süresince,	**Alanya'daki Alternatif Turizm olanakları**		"normal"inin en fazla kaç katına	inebilir?
86					çıkabilir?

Table 28 (continued)

87	**Alanya'daki Alternatif Turizm olanakları**	artıp azaldığında	**bir yıl içinde Alanya'ya gelen Alternatif Turizm ile ilgilenen toplam turist sayısı**	nasıl değişir? (doğru/ters orantı, hızlı/yavaş, lineer/nonlineer)	
88		minimum seviyesinde iken		her yıl "normal"inin en fazla % kaçı kadar artabilir/azalabilir?	
89		maximum seviyesinde iken			
90	2007'den itibaren 13 sene süresince,	**Alanya'daki Alternatif Turizm olanakları**		"normal"inin en fazla kaç katına	inebilir?
91					çıkabilir?
92	**Alanya'daki Alternatif Turizm olanakları**	artıp azaldığında	**Alanya Turizm Sektörü için, Seyahat Acenteleri olmadan yaşanabilecek "sezon süresi" (WO)**	nasıl değişir? (doğru/ters orantı, hızlı/yavaş, lineer/nonlineer)	
93		minimum seviyesinde iken		her yıl "normal"inin en fazla % kaçı kadar artabilir/azalabilir?	
94		maximum seviyesinde iken			
95	2007'den itibaren 13 sene süresince,	**Sektördeki, Alanya Turizmini tanıtım faaliyetleri**		"normal"inin en fazla kaç katına	inebilir?
96					çıkabilir?
97	**Sektördeki, Alanya Turizmini tanıtım faaliyetleri**	artıp azaldığında	**yaz turizmi için Alanya'ya gelmek isteyenlerin sayısı**	nasıl değişir? (doğru/ters orantı, hızlı/yavaş, lineer/nonlineer)	
98		minimum seviyesinde iken		her yıl "normal"inin en fazla % kaçı kadar artabilir/azalabilir?	
99		maximum seviyesinde iken			
100	2007'den itibaren 13 sene süresince,	**Sektördeki, Alanya Turizmini tanıtım faaliyetleri**		"normal"inin en fazla kaç katına	inebilir?
101					çıkabilir?
102	**Sektördeki, Alanya Turizmini tanıtım faaliyetleri**	artıp azaldığında	**bir yıl içinde Alanya'ya gelen Alternatif Turizm ile ilgilenen toplam turist sayısı**	nasıl değişir? (doğru/ters orantı, hızlı/yavaş, lineer/nonlineer)	
103		minimum seviyesinde iken		her yıl "normal"inin en fazla % kaçı kadar artabilir/azalabilir?	
104		maximum seviyesinde iken			
105	2007'den itibaren 13 sene süresince,	**Sezon dışında kapalı veya atıl vaziyette kalan işletme yüzdesi**		"normal"inin en fazla kaç katına	inebilir?
106					çıkabilir?

Table 28 (continued)

107	**Sezon dışında kapalı veya atıl vaziyette kalan işletme yüzdesi**	artıp azaldığında	**Alanya Turizm Sektörü için, Seyahat Acenteleri olmadan yaşanabilecek "sezon süresi" (WO)**	nasıl değişir? (doğru/ters orantı, hızlı/yavaş, lineer/nonlineer)	
108		minimum seviyesinde iken		her yıl "normal"inin en fazla % kaçı kadar artabilir/azalabilir?	
109		maximum seviyesinde iken			
110	2007'den itibaren 13 sene süresince,	**Alanyadaki Konaklama Tesislerinde çalışan vasıflı eleman yüzdesi**		"normal"inin en fazla kaç katına	inebilir?
111					çıkabilir?
112	**Alanyadaki Konaklama Tesislerinde çalışan vasıflı eleman yüzdesi**	artıp azaldığında	**Alanya Turizm Sektöründeki vasıflı eleman arz / talebi**	nasıl değişir? (doğru/ters orantı, hızlı/yavaş, lineer/nonlineer)	
113		minimum seviyesinde iken		her yıl "normal"inin en fazla % kaçı kadar artabilir/azalabilir?	
114		maximum seviyesinde iken			
115	2007'den itibaren 13 sene süresince,	**Alanya Turizm Sektöründeki vasıflı eleman arz / talebi**		"normal"inin en fazla kaç katına	inebilir?
116					çıkabilir?
117	**Alanya Turizm Sektöründeki vasıflı eleman arz / talebi**	artıp azaldığında	**Konaklama Tesislerinde, günlük turist başı yapılan harcama içinde, çalışan ücreti için ayrılan miktar**	nasıl değişir? (doğru/ters orantı, hızlı/yavaş, lineer/nonlineer)	
118		minimum seviyesinde iken		her yıl "normal"inin en fazla % kaçı kadar artabilir/azalabilir?	
119		maximum seviyesinde iken			
120	2007'den itibaren 13 sene süresince,	**Alanya'daki Turizm Eğitimi olanakları (yeni kurulması muhtemel Üniversite haricinde)**		"normal"inin en fazla kaç katına	inebilir?
121					çıkabilir?
122	**Alanya'daki Turizm Eğitimi olanakları (yeni kurulması muhtemel Üniversite haricinde)**	artıp azaldığında	**Alanya Turizm Sektöründeki vasıflı eleman arz / talebi**	nasıl değişir? (doğru/ters orantı, hızlı/yavaş, lineer/nonlineer)	
123		minimum seviyesinde iken		her yıl "normal"inin en fazla % kaçı kadar artabilir/azalabilir?	
124		maximum seviyesinde iken			
	* İlgili soruda geçen değişkenlerin,(varsa) "normal" değerleri veya (varsa) "ilk" değerleri sağlanır.				

Table 29 Structured Interview Schedule – 3

No	Soru				
125	2007'den itibaren 13 sene süresince,	**(Konaklama Tesisleri için) Herşey Dahil standartları sayısı**		"normal"inden en fazla kaça	çıkabilir?
126	**(Konaklama Tesisleri için) Herşey Dahil standartları sayısı**	artıp azaldığında	**Alanyadaki Konaklama Tesislerinin Kalitesi**	nasıl değişir? (doğru/ters orantı, hızlı/yavaş, lineer/nonlineer)	
127		maximum seviyesinde iken		her yıl "bir önceki yıldaki değerinin" en fazla % kaçı kadar artabilir/azalabilir?	
128	2007'den itibaren 13 sene süresince,	**Alanya'da bir üniversitenin varlığı**		"normal"inden en fazla kaça	çıkabilir?
129	**Alanya'da bir üniversitenin varlığı**	artıp azaldığında	**Sezon dışında kapalı veya atıl vaziyette olan işletmelerin yüzdesi**	nasıl değişir? (doğru/ters orantı, hızlı/yavaş, lineer/nonlineer)	
130		maximum seviyesinde iken		her yıl "bir önceki yıldaki değerinin" en fazla % kaçı kadar artabilir/azalabilir?	
131	2007'den itibaren 13 sene süresince,	**Alanya yakınlarında (Antalya Havalanından daha yakın) bir havaalanının varlığı**		"normal"inden en fazla kaça	çıkabilir?
132	**Alanya yakınlarında (Antalya Havalanından daha yakın) bir havaalanının varlığı**	artıp azaldığında	**Seyahat Acentelerinin Alanya'dan elde ettikleri kişi başı günlük kar / Başka Turizm Merkezlerinden elde ettikleri kişi başı günlük kar oranı**	nasıl değişir? (doğru/ters orantı, hızlı/yavaş, lineer/nonlineer)	
133		maximum seviyesinde iken		her yıl "normal"inin en fazla % kaçı kadar artabilir/azalabilir?	
134	2007'den itibaren 13 sene süresince,	**Alanya'daki bir üniversitenin mezunlarının varlığı**		"normal"inden en fazla kaça	çıkabilir?
135	**Alanya'daki bir üniversitenin mezunlarının varlığı**	artıp azaldığında	**Alanyadaki Konaklama Tesislerinde çalışan vasıflı eleman yüzdesi**	nasıl değişir? (doğru/ters orantı, hızlı/yavaş, lineer/nonlineer)	
136		maximum seviyesinde iken		her yıl "normal"inin en fazla % kaçı kadar artabilir/azalabilir?	
137	Alanya Turizm Sektörü çapında, Seyahat Acenteleri olmadan yaşanan "sezon süresi" (WO) ile, Seyahat Acentelerine bağımlı kalarak yaşanan "sezon süresi" (W) arasında nasıl bir ilişki vardır? ("WO x kadar sürüyorsa, W y kadar sürecektir" vb şeklinde açıklayınız).				

APPENDIX D

ISSUES VERSUS INTERVIEW QUESTIONS MATRIX

Table 30 Issues versus Interview Questions Matrix - 1

No	Issue	Objective
1	INIT AF_qua	INIT AF_qua
2	INIT AP_fby_TA	INIT AP_fby_TA
3	INIT perof_CE_oos	INIT perof_CE_oos
4	INIT perof_QE	INIT perof_QE
5	N_PCI_AF_qua	N_PCI_AF_qua
6	N_PCI_AP_fby_TA	N_PCI_AP_fby_TA
7	N_PCI_depto_TA	N_PCI_depto_TA
8	N_PCI_nof_AF	N_PCI_nof_AF
9	N_PCI_perof_CE_oos	N_PCI_perof_CE_oos
10	N_PCI_perof_QE	N_PCI_perof_QE
11	N_AP_deby_AF	N_AP_deby_AF
12	N_nof_ALT	N_nof_ALT
13	N_PR_of_TA_fr_AO	N_PR_of_TA_fr_AO
14	N_QE_sal	N_QE_sal
15	N_QE_supdem	N_QE_supdem
16	N_supdem_for_AF	N_supdem_for_AF
17	NRC_per_ST	NRC_per_ST
18	OC	OC
19	STC	STC

Table 31 Issues versus Interview Questions Matrix – 2

No	Issue *	Objective
20	AEOF_AMP_of_AF_on_nof_AF = GRAPH(AMP_of_AF/N_AMP_of_AF)	Minimum of input
21		Maximum of input
22		Proportional relation
23		max. PCI output for Minimum of input
24		max. PCI output for Maximum of input
25	AEOF_nof_TAI_on_AP_fby_TA = GRAPH(nof_TAI/N_nof_TAI)	Minimum of input
26		Maximum of input
27		Proportional relation
28		max. PCI output for Minimum of input
29		max. PCI output for Maximum of input
30	AEOF_perof_QE_on_AF_qua = GRAPH(perof_QE/N_perof_QE)	Minimum of input
31		Maximum of input
32		Proportional relation
33		max. PCI output for Minimum of input
34		max. PCI output for Maximum of input
35	AEOF_QE_sal_on_perof_QE = GRAPH(QE_sal/N_QE_sal)	Minimum of input
36		Maximum of input
37		Proportional relation
38		max. PCI output for Minimum of input
39		max. PCI output for Maximum of input
40	AEOF_SP_wwo_TA_on_depto_TA = GRAPH(SP_wwo_TA/N_SP_wwo_TA)	Minimum of input
41		Maximum of input
42		Proportional relation
43		max. PCI output for Minimum of input
44		max. PCI output for Maximum of input
45	AEOF_SP_w_TA_on_perof_CE_oos = GRAPH(SP_w_TA/N_SP_w_TA)	Minimum of input
46		Maximum of input
47		Proportional relation
48		max. PCI output for Minimum of input
49		max. PCI output for Maximum of input
50	AEOF_supdem_for_AF_on_depto_TA = GRAPH(supdem_for_AF/N_supdem_for_AF)	Minimum of input
51		Maximum of input
52		Proportional relation
53		max. PCI output for Minimum of input

Table 31 (continued)

54		max. PCI output for Maximum of input
55	AEOF_wwo_TA_ind_on_depto_TA = GRAPH(wwo_TA_ind/N_wwo_TA_ind)	Minimum of input
56		Maximum of input
57		Proportional relation
58		max. PCI output for Minimum of input
59		max. PCI output for Maximum of input
60	MEOF_AF_qua_on_AP_deby_AF = GRAPH(AF_qua/N_AF_qua)	Minimum of input
61		Maximum of input
62		Proportional relation
63		max. PCI output for Minimum of input
64		max. PCI output for Maximum of input
65	MEOF_AF_qua_on_nof_int_TAI = GRAPH(AF_qua/N_AF_qua)	Minimum of input
66		Maximum of input
67		Proportional relation
68		max. PCI output for Minimum of input
69		max. PCI output for Maximum of input
70	MEOF_AP_fby_TA_on_PR_of_TA_fr_AO = GRAPH(AP_fby_TA/N_AP_fby_TA)	Minimum of input
71		Maximum of input
72		Proportional relation
73		max. PCI output for Minimum of input
74		max. PCI output for Maximum of input
75	MEOF_nof_AF_on_supdem_for_AF = GRAPH(nof_AF/N_nof_AF)	Minimum of input
76		Maximum of input
77		Proportional relation
78		max. PCI output for Minimum of input
79		max. PCI output for Maximum of input
80	MEOF_nof_ALT_on_supdem_for_AF = GRAPH(nof_ALT/N_nof_ALT)	Minimum of input
81		Maximum of input
82		Proportional relation
83		max. PCI output for Minimum of input
84		max. PCI output for Maximum of input
85	MEOF_nof_ATO_on_nof_TATO = GRAPH(nof_ATO/N_nof_ATO)	Minimum of input
86		Maximum of input
87		Proportional relation
88		max. PCI output for Minimum of input

Table 31 (continued)

89		max. PCI output for Maximum of input
90	MEOF_nof_ATO_on_SP_wo_TA = GRAPH(nof_TATO/N_nof_TATO)	Minimum of input
91		Maximum of input
92		Proportional relation
93		max. PCI output for Minimum of input
94		max. PCI output for Maximum of input
95	MEOF_nof_PA_on_nof_int_TAI = GRAPH(nof_PA/N_nof_PA)	Minimum of input
96		Maximum of input
97		Proportional relation
98		max. PCI output for Minimum of input
99		max. PCI output for Maximum of input
100	MEOF_nof_PA_on_nof_TATO = GRAPH(nof_PA/N_nof_PA)	Minimum of input
101		Maximum of input
102		Proportional relation
103		max. PCI output for Minimum of input
104		max. PCI output for Maximum of input
105	MEOF_perof_CE_oos_on_SP_wo_TA = GRAPH(perof_CE_oos/N_perof_CE_oos)	Minimum of input
106		Maximum of input
107		Proportional relation
108		max. PCI output for Minimum of input
109		max. PCI output for Maximum of input
110	MEOF_perof_QE_on_QE_supdem = GRAPH(perof_QE/N_perof_QE)	Minimum of input
111		Maximum of input
112		Proportional relation
113		max. PCI output for Minimum of input
114		max. PCI output for Maximum of input
115	MEOF_QE_supdem_on_QE_sal = GRAPH(QE_supdem/N_QE_supdem)	Minimum of input
116		Maximum of input
117		Proportional relation
118		max. PCI output for Minimum of input
119		max. PCI output for Maximum of input
120	MEOF_TEO_on_QE_supdem = GRAPH(TEO/N_TEO)	Minimum of input
121		Maximum of input
122		Proportional relation
123		max. PCI output for Minimum of input

Table 31 (continued)

124		max. PCI output for Maximum of input
	* (EOF_Output = GRAPH(Input))	

Table 32 Issues versus Interview Questions Matrix – 3

No	Issue	Objective
125	IR_AEOF_nof_AI_ST_on_AF_qua = GRAPH(nof_AI_ST)	Maximum of input
126		Proportional relation
127		max. PCI output for Maximum of input
128	IR_AEOF_Unv_on_perof_CE_oos = GRAPH(Unv)	Maximum of input
129		Proportional relation
130		max. PCI output for Maximum of input
131	IR_MEOF_NAC_on_PR_of_TA_fr_AO = GRAPH(NAC)	Maximum of input
132		Proportional relation
133		max. PCI output for Maximum of input
134	IR_MEOF_UG_on_QE_supdem = GRAPH(UG)	Maximum of input
135		Proportional relation
136		max. PCI output for Maximum of input
137	SP_w_TA = GRAPH(SP_wo_TA)	SP_w_TA = GRAPH(SP_wo_TA)

APPENDIX E

MATHEMATICAL FORMULATIONS OF ALANYA TOURISM SECTOR MODEL

AF_qua(t) = AF_qua(t - dt) + (IOF_AF_qua) * dt
INIT AF_qua = 70
INFLOWS:
IOF_AF_qua = IF (AF_qua<100) THEN PCI_AF_qua*AF_qua ELSE 0
AP_fby_TA(t) = AP_fby_TA(t - dt) + (IOF_AP_fby_TA) * dt
INIT AP_fby_TA = 20
INFLOWS:
IOF_AP_fby_TA = AP_fby_TA*PCI_AP_fby_TA
depto_TA(t) = depto_TA(t - dt) + (IOF_depto_TA) * dt
INIT depto_TA = 87.4
INFLOWS:
IOF_depto_TA = IF (depto_TA<100) THEN depto_TA*PCI_depto_TA ELSE 0
nof_AF(t) = nof_AF(t - dt) + (IOF_nof_AF) * dt
INIT nof_AF = 717
INFLOWS:
IOF_nof_AF = nof_AF*PCI_nof_AF
perof_CE_oos(t) = perof_CE_oos(t - dt) + (IOF_perof__CE_oos) * dt
INIT perof_CE_oos = 80
INFLOWS:
IOF_perof__CE_oos = IF (perof_CE_oos<100) THEN PCI_perof_CE_oos*perof_CE_oos ELSE 0
perof_QE(t) = perof_QE(t - dt) + (IOF_perof_QE) * dt
INIT perof_QE = 50
INFLOWS:
IOF_perof_QE = IF (perof_QE<100) THEN perof_QE*PCI_perof_QE ELSE 0
AC = OC+E_sal+(nof_AI_ST*STC)
AMP_of_AF = (nof_ALT/nof_AF)*(PR_of_AF*DS)/12

```
AP = (AP_fby_TA*depto_TA*0.01)+(AP_deby_AF*(1-(depto_TA*0.01)))
AP_deby_AF = N_AP_deby_AF*MEOF_AF_qua_on_AP_deby_AF
DS = 9.91
E_sal = (QE_sal*(0.01*perof_QE))+(Non_QE_sal*(1-(0.01*perof_QE)))
IR_AEOF_NRC_on_nof_AF = -(NRC/AMP_of_AF)/4
nof_ALT = nof_TATO+nof_TAI
nof_ATO = 3
nof_int_TAI =
N_nof_int_TAI*MEOF_AF_qua_on_nof_int_TAI*MEOF_nof_PA_on_nof_int
_TAI
nof_PA = 3
nof_TAI = nof_int_TAI*PR_of_TA_fr_AO
nof_TATO =
N_nof_TATO*MEOF_nof_ATO_on_nof_TATO*MEOF_nof_PA_on_nof_TA
TO
Non_QE_sal = QE_sal/2
NRC = IF ( DERIVN(DELAY(nof_AI_ST,1),1) > 0 ) THEN
(nof_AI_ST*NRC_per_ST) ELSE 0
NRC_per_ST = 150
N_AF_qua = 70
N_AMP_of_AF = 8074.21
N_AP_deby_AF = 25
N_AP_fby_TA = 20
N_nof_AF = 717
N_nof_ALT = 1699017
N_nof_ATO = 3
N_nof_int_TAI = 1649934.287
N_nof_PA = 3
N_nof_TAI = 1484940.858
N_nof_TATO = 214076.142
N_PCI_AF_qua = -0.01
N_PCI_AP_fby_TA = -0.001
N_PCI_depto_TA = 0
N_PCI_nof_AF = 0.002
N_PCI_perof_CE_oos = 0.005
N_PCI_perof_QE = 0
N_perof_CE_oos = 80
N_perof_QE = 50
N_PR_of_TA_fr_AO = 0.9
N_QE_sal = 4.126
N_QE_supdem = 1
N_SP_wo_TA = 4
N_SP_wwo_TA = N_SP_w_TA/N_SP_wo_TA
N_SP_w_TA = 7
N_supdem_for_AF = 1.1
N_TEO = 3
```

N_wwo_TA_ind = 5.55
OC = 13.4095
PCI_AF_qua =
N_PCI_AF_qua+AEOF_perof_QE_on_AF_qua+IR_AEOF_nof_AI_ST_on_AF_qua
PCI_AP_fby_TA = N_PCI_AP_fby_TA+AEOF_nof_TAI_on_AP_fby_TA
PCI_depto_TA =
N_PCI_depto_TA+AEOF_supdem_for_AF_on_depto_TA+AEOF_SP_wwo_TA_on_depto_TA+AEOF_wwo_TA_ind_on_depto_TA
PCI_nof_AF =
N_PCI_nof_AF+AEOF_AMP_of_AF_on_nof_AF+IR_AEOF_NRC_on_nof_AF
PCI_perof_CE_oos =
N_PCI_perof_CE_oos+AEOF_SP_w_TA_on_perof_CE_oos+IR_AEOF_Unv_on_perof_CE_oos
PCI_perof_QE = N_PCI_perof_QE+AEOF_QE_sal_on_perof_QE
PR_of_AF = AP-AC
PR_of_TA_fr_AO =
N_PR_of_TA_fr_AO*MEOF_AP_fby_TA_on_PR_of_TA_fr_AO*IR_MEOF_NAC_on_PR_of_TA_fr_AO
QE_sal = N_QE_sal*MEOF_QE_supdem_on_QE_sal
QE_supdem =
N_QE_supdem*MEOF_TEO_on_QE_supdem*MEOF_perof_QE_on_QE_supdem*IR_MEOF_UG_on_QE_supdem
SP_wo_TA =
N_SP_wo_TA*MEOF_nof_ATO_on_SP_wo_TA*MEOF_perof_CE_oos_on_SP_wo_TA*MEOF_nof_ATO_on_SP_wo_TA
SP_wwo_TA = SP_w_TA/SP_wo_TA
STC = 0.05
supdem_for_AF =
N_supdem_for_AF*MEOF_nof_AF_on_supdem_for_AF*MEOF_nof_ALT_on_supdem_for_AF
TYINC = AP*nof_ALT*DS
UG =
DELAY(Unv,4)+DELAY(DELAY(Unv,4),4)+DELAY(DELAY(DELAY(Unv,4),4),4)+DELAY(DELAY(DELAY(DELAY(Unv,4),4),4),4)
wwo_TA_ind = (AP_fby_TA*depto_TA)/(AP_deby_AF*(100-depto_TA))
AEOF_AMP_of_AF_on_nof_AF = GRAPH(AMP_of_AF/N_AMP_of_AF)
(0.333, -0.02), (0.5, -0.018), (0.666, -0.0133), (0.833, -0.00675), (1, 0.00), (1.17, 0.005), (1.33, 0.0088), (1.50, 0.0124), (1.67, 0.015), (1.83, 0.0172), (2.00, 0.0188)
AEOF_nof_TAI_on_AP_fby_TA = GRAPH(nof_TAI/N_nof_TAI)
(0.75, -0.0099), (0.8, -0.0091), (0.85, -0.0075), (0.9, -0.0055), (0.95, -0.003), (1.00, 0.0001), (1.05, 0.003), (1.10, 0.0057), (1.15, 0.0078), (1.20, 0.0093), (1.25, 0.01)
AEOF_perof_QE_on_AF_qua = GRAPH(perof_QE/N_perof_QE)

(0.5, -0.0495), (0.667, -0.046), (0.833, -0.031), (1, 0.00), (1.17, 0.0295), (1.33, 0.0528), (1.50, 0.0715), (1.67, 0.0858), (1.83, 0.094), (2.00, 0.0993)
AEOF_QE_sal_on_perof_QE = GRAPH(QE_sal/N_QE_sal)
(0.5, 0.05), (0.6, 0.0475), (0.7, 0.0425), (0.8, 0.034), (0.9, 0.019), (1, 0.00), (1.10, -0.022), (1.20, -0.034), (1.30, -0.043), (1.40, -0.047), (1.50, -0.0495)
AEOF_SP_wwo_TA_on_depto_TA =
GRAPH(SP_wwo_TA/N_SP_wwo_TA)
(0.25, -0.045), (0.375, -0.0435), (0.5, -0.0375), (0.625, -0.0315), (0.75, -0.022), (0.875, -0.013), (1.00, 0.00), (1.13, 0.019), (1.25, 0.0315), (1.38, 0.0405), (1.50, 0.044)
AEOF_SP_w_TA_on_perof_CE_oos = GRAPH(SP_w_TA/N_SP_w_TA)
(0.8, 0.048), (0.9, 0.0175), (1.00, 0.00), (1.10, -0.0135), (1.20, -0.0255), (1.30, -0.034), (1.40, -0.039), (1.50, -0.0435), (1.60, -0.047), (1.70, -0.049)
AEOF_supdem_for_AF_on_depto_TA =
GRAPH(supdem_for_AF/N_supdem_for_AF)
(0.5, -0.0195), (0.625, -0.018), (0.75, -0.0147), (0.875, -0.008), (1.00, 0.00), (1.13, 0.0102), (1.25, 0.0167), (1.38, 0.0218), (1.50, 0.0257), (1.63, 0.0285), (1.75, 0.0295)
AEOF_wwo_TA_ind_on_depto_TA =
GRAPH(wwo_TA_ind/N_wwo_TA_ind)
(0.4, -0.0099), (0.6, -0.0088), (0.8, -0.006), (1.00, 0.00), (1.20, 0.0033), (1.40, 0.0055), (1.60, 0.0072), (1.80, 0.0087), (2.00, 0.0096), (2.20, 0.0098)
IR_AEOF_nof_AI_ST_on_AF_qua = GRAPH(nof_AI_ST)
(0.00, 0.00), (2.00, 0.003), (4.00, 0.006), (6.00, 0.009), (8.00, 0.012), (10.0, 0.0148), (12.0, 0.018), (14.0, 0.0211), (16.0, 0.0241), (18.0, 0.027), (20.0, 0.03)
IR_AEOF_Unv_on_perof_CE_oos = GRAPH(Unv)
(0.00, 0.00), (0.1, -0.005), (0.2, -0.01), (0.3, -0.015), (0.4, -0.02), (0.5, -0.025), (0.6, -0.03), (0.7, -0.035), (0.8, -0.04), (0.9, -0.045), (1, -0.05)
IR_MEOF_NAC_on_PR_of_TA_fr_AO = GRAPH(NAC)
(0.00, 1.00), (0.1, 1.00), (0.2, 1.01), (0.3, 1.02), (0.4, 1.03), (0.5, 1.04), (0.6, 1.05), (0.7, 1.06), (0.8, 1.08), (0.9, 1.10), (1, 1.11), (1.10, 1.13), (1.20, 1.15), (1.30, 1.17), (1.40, 1.20), (1.50, 1.22)
IR_MEOF_UG_on_QE_supdem = GRAPH(UG)
(0.00, 1.00), (0.1, 1.02), (0.2, 1.03), (0.3, 1.06), (0.4, 1.08), (0.5, 1.11), (0.6, 1.15), (0.7, 1.18), (0.8, 1.22), (0.9, 1.26), (1, 1.30), (1.10, 1.35), (1.20, 1.40), (1.30, 1.45), (1.40, 1.51), (1.50, 1.58)
MEOF_AF_qua_on_AP_deby_AF = GRAPH(AF_qua/N_AF_qua)
(0.5, 0.903), (0.6, 0.91), (0.7, 0.923), (0.8, 0.945), (0.9, 0.968), (1, 1.00), (1.10, 1.03), (1.20, 1.05), (1.30, 1.08), (1.40, 1.09), (1.50, 1.10)
MEOF_AF_qua_on_nof_int_TAI = GRAPH(AF_qua/N_AF_qua)
(0.5, 0.851), (0.583, 0.857), (0.667, 0.878), (0.75, 0.905), (0.833, 0.936), (0.917, 0.966), (1.00, 1.00), (1.08, 1.03), (1.17, 1.06), (1.25, 1.08), (1.33, 1.09), (1.42, 1.09), (1.50, 1.10)
MEOF_AP_fby_TA_on_PR_of_TA_fr_AO =
GRAPH(AP_fby_TA/N_AP_fby_TA)

(0.75, 0.98), (0.8, 0.982), (0.85, 0.986), (0.9, 0.991), (0.95, 0.995), (1.00, 1.00), (1.05, 1.01), (1.10, 1.01), (1.15, 1.02), (1.20, 1.02), (1.25, 1.02)
MEOF_nof_AF_on_supdem_for_AF = GRAPH(nof_AF/N_nof_AF)
(0.5, 0.5), (0.6, 0.6), (0.7, 0.7), (0.8, 0.8), (0.9, 0.9), (1, 1.00), (1.10, 1.10), (1.20, 1.20), (1.30, 1.30), (1.40, 1.40), (1.50, 1.50)
MEOF_nof_ALT_on_supdem_for_AF = GRAPH(nof_ALT/N_nof_ALT)
(0.7, 1.10), (0.75, 1.10), (0.8, 1.08), (0.85, 1.06), (0.9, 1.04), (0.95, 1.02), (1.00, 1.00), (1.05, 0.979), (1.10, 0.958), (1.15, 0.939), (1.20, 0.92), (1.25, 0.907), (1.30, 0.902)
MEOF_nof_ATO_on_nof_TATO = GRAPH(nof_ATO/N_nof_ATO)
(0.5, 0.5), (0.75, 0.75), (1.00, 1.00), (1.25, 1.25), (1.50, 1.50), (1.75, 1.75), (2.00, 2.00), (2.25, 2.25), (2.50, 2.50), (2.75, 2.75), (3.00, 3.00)
MEOF_nof_ATO_on_SP_wo_TA = GRAPH(nof_TATO/N_nof_TATO)
(0.5, 0.808), (0.75, 0.91), (1.00, 1.00), (1.25, 1.07), (1.50, 1.13), (1.75, 1.17), (2.00, 1.21), (2.25, 1.24), (2.50, 1.27), (2.75, 1.29), (3.00, 1.30)
MEOF_nof_PA_on_nof_int_TAI = GRAPH(nof_PA/N_nof_PA)
(0.8, 0.95), (0.9, 0.956), (1.00, 1.00), (1.10, 1.01), (1.20, 1.02), (1.30, 1.03), (1.40, 1.03), (1.50, 1.03), (1.60, 1.04), (1.70, 1.04), (1.80, 1.04), (1.90, 1.05), (2.00, 1.05)
MEOF_nof_PA_on_nof_TATO = GRAPH(nof_PA/N_nof_PA)
(0.8, 0.9), (0.9, 0.954), (1.00, 1.00), (1.10, 1.04), (1.20, 1.08), (1.30, 1.11), (1.40, 1.13), (1.50, 1.15), (1.60, 1.17), (1.70, 1.18), (1.80, 1.19), (1.90, 1.20), (2.00, 1.20)
MEOF_perof_CE_oos_on_SP_wo_TA =
GRAPH(perof_CE_oos/N_perof_CE_oos)
(0.5, 1.02), (0.563, 1.02), (0.625, 1.02), (0.688, 1.02), (0.75, 1.01), (0.813, 1.01), (0.875, 1.01), (0.938, 1.00), (1.00, 1.00), (1.06, 0.993), (1.13, 0.984), (1.19, 0.975), (1.25, 0.97)
MEOF_perof_QE_on_QE_supdem = GRAPH(perof_QE/N_perof_QE)
(0.5, 1.49), (0.625, 1.47), (0.75, 1.39), (0.875, 1.25), (1.00, 1.00), (1.13, 0.919), (1.25, 0.874), (1.38, 0.84), (1.50, 0.818), (1.63, 0.795), (1.75, 0.78), (1.88, 0.765), (2.00, 0.75)
MEOF_QE_supdem_on_QE_sal = GRAPH(QE_supdem/N_QE_supdem)
(0.5, 1.10), (0.75, 1.07), (1.00, 1.00), (1.25, 0.946), (1.50, 0.908), (1.75, 0.877), (2.00, 0.854), (2.25, 0.835), (2.50, 0.82), (2.75, 0.809), (3.00, 0.803)
MEOF_TEO_on_QE_supdem = GRAPH(TEO/N_TEO)
(0.5, 0.814), (0.625, 0.841), (0.75, 0.881), (0.875, 0.921), (1.00, 1.00), (1.13, 1.23), (1.25, 1.52), (1.38, 1.89), (1.50, 2.23), (1.63, 2.52), (1.75, 2.78), (1.88, 2.93), (2.00, 2.99)
NAC = GRAPH(time)
(0.00, 0.00), (1.00, 0.00), (2.00, 0.00), (3.00, 0.00), (4.00, 0.00), (5.00, 0.00), (6.00, 0.00), (7.00, 0.00), (8.00, 0.00), (9.00, 0.00), (10.0, 0.00), (11.0, 0.00), (12.0, 0.00), (13.0, 0.00)
nof_AI_ST = GRAPH(time)
(0.00, 0.00), (1.00, 0.00), (2.00, 0.00), (3.00, 0.00), (4.00, 0.00), (5.00, 0.00), (6.00, 0.00), (7.00, 0.00), (8.00, 0.00), (9.00, 0.00), (10.0, 0.00)

SP_w_TA = GRAPH(SP_wo_TA)
(3.00, 6.00), (4.00, 7.00), (5.00, 7.95), (6.00, 8.85), (7.00, 9.66), (8.00, 10.3), (9.00, 10.9), (10.0, 11.4), (11.0, 11.8), (12.0, 12.0)
TEO = GRAPH(time)
(0.00, 3.00), (1.00, 3.00), (2.00, 3.00), (3.00, 3.00), (4.00, 3.00), (5.00, 3.00), (6.00, 3.00), (7.00, 3.00), (8.00, 3.00), (9.00, 3.00), (10.0, 3.00), (11.0, 3.00), (12.0, 3.00), (13.0, 3.00)
Unv = GRAPH(time)
(0.00, 0.00), (1.00, 0.00), (2.00, 0.00), (3.00, 0.00), (4.00, 0.00), (5.00, 0.00), (6.00, 0.00), (7.00, 0.00), (8.00, 0.00), (9.00, 0.00), (10.0, 0.00), (11.0, 0.00), (12.0, 0.00), (13.0, 0.00)

APPENDIX F

RUNNING THE MODEL IN EXTREME CONDITIONS

1. INIT AF_qua = 0

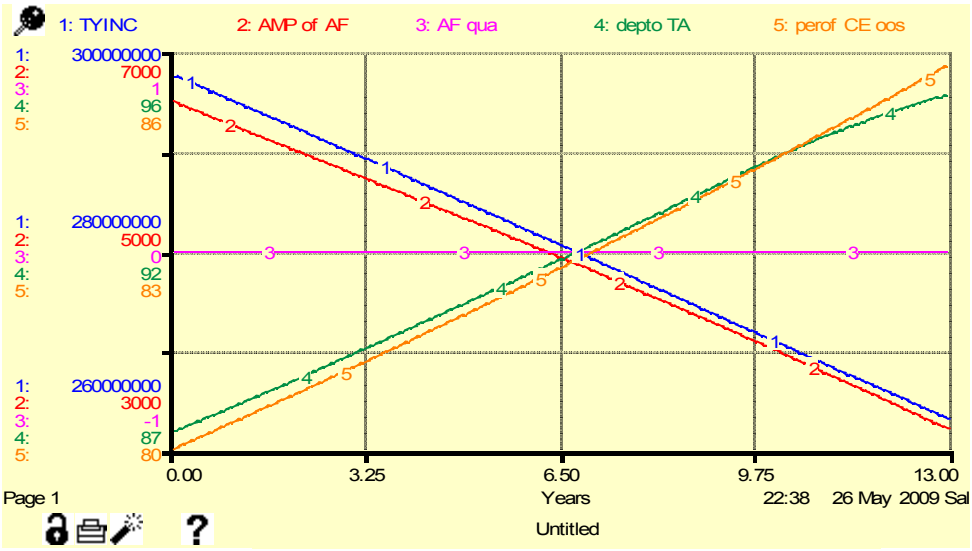


Figure 34 Outputs of Extreme Conditions Run - 1

2. INIT AF_qua =100

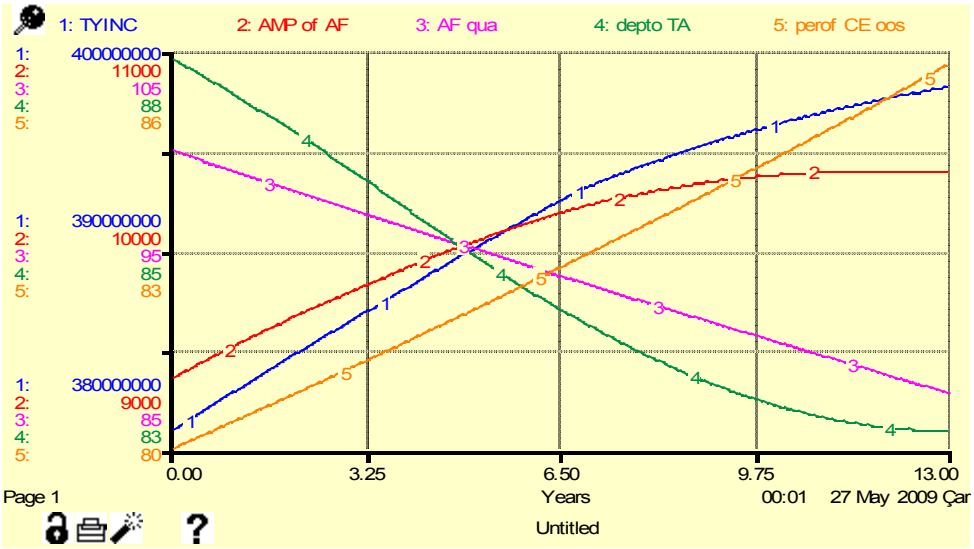


Figure 35 Outputs of Extreme Conditions Run - 2

3. INIT AP_fby_TA = 0

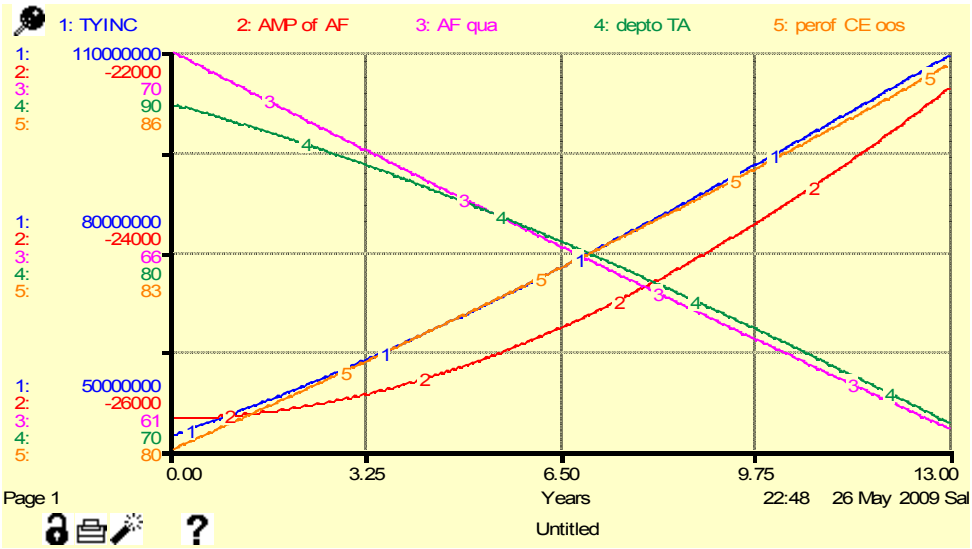


Figure 36 Outputs of Extreme Conditions Run - 3

4. INIT AP_fby_TA = 25

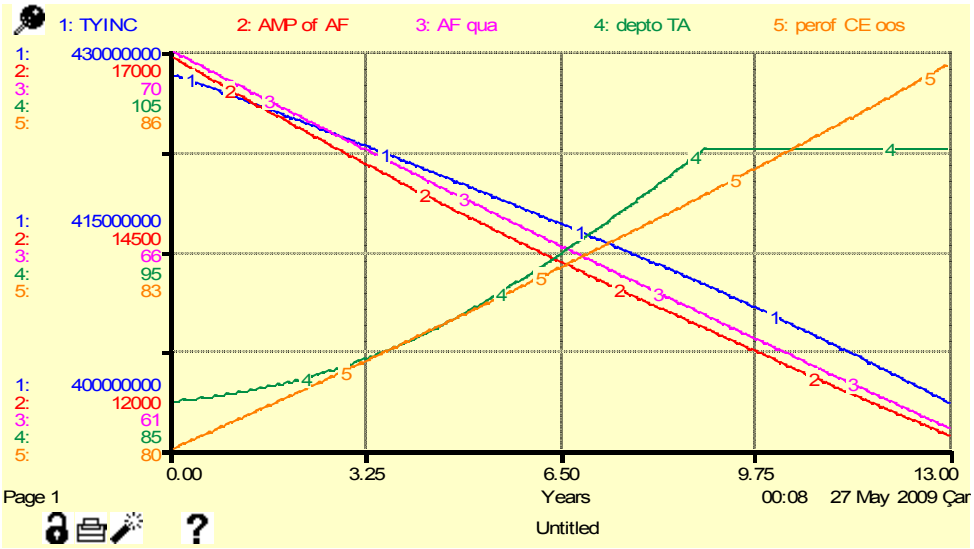


Figure 37 Outputs of Extreme Conditions Run - 4

5. INIT depto_TA = 0

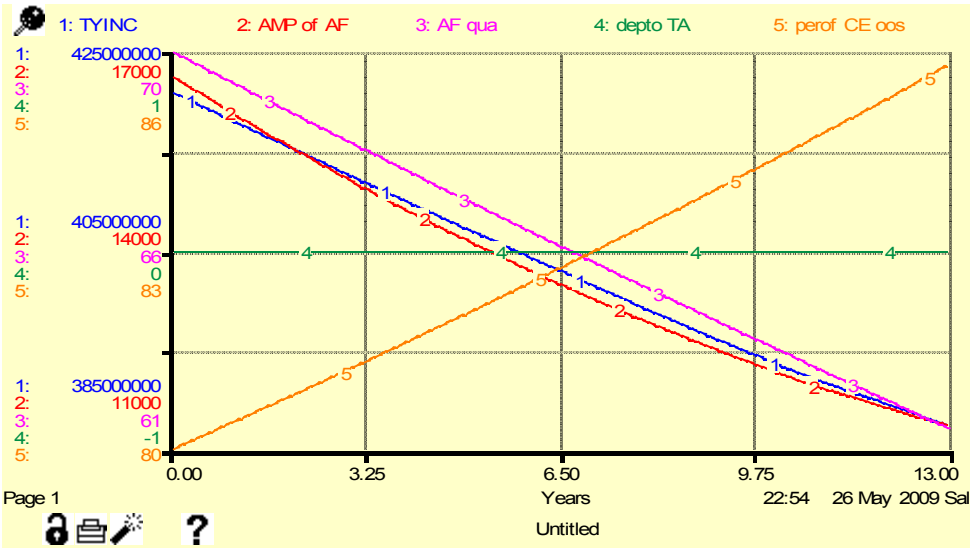


Figure 38 Outputs of Extreme Conditions Run - 5

6. INIT depto_TA = 100

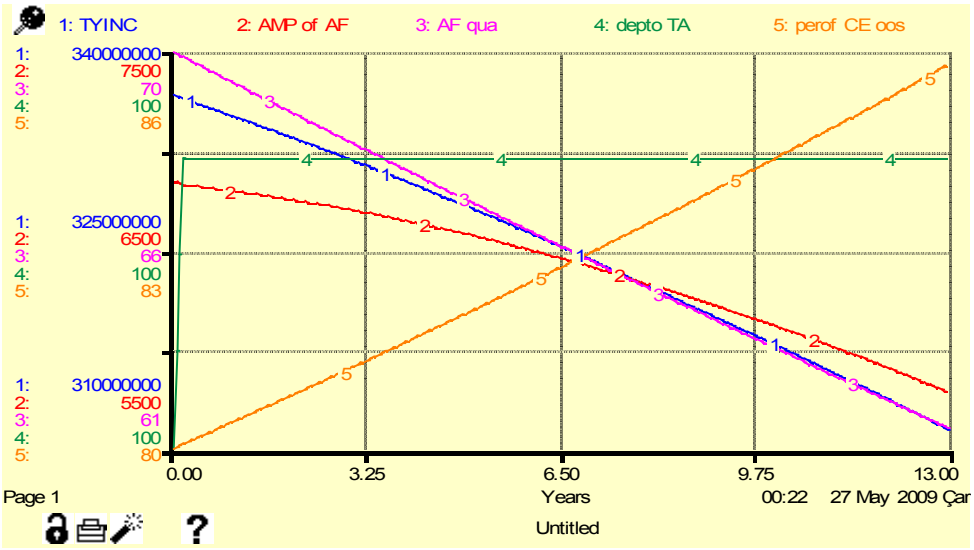


Figure 39 Outputs of Extreme Conditions Run - 6

7. INIT nof_AF = 0

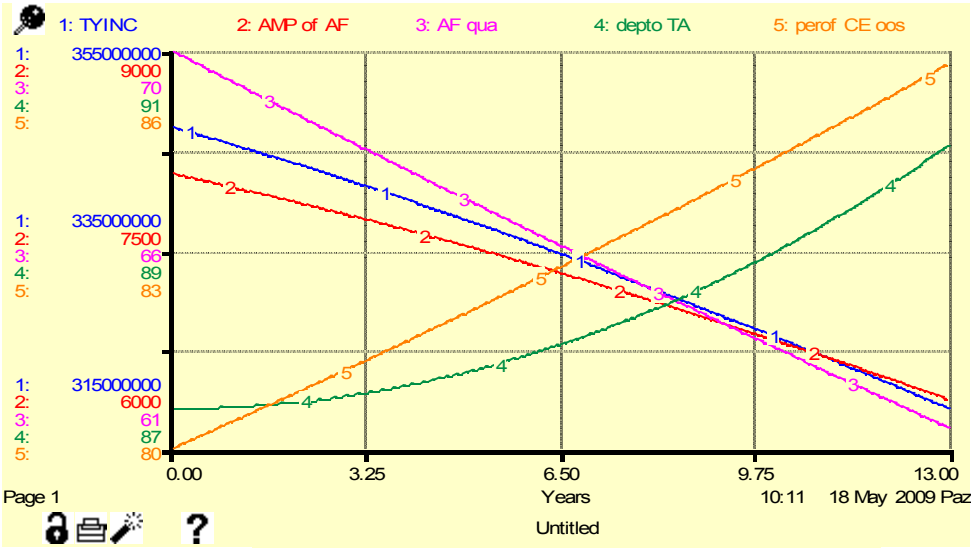


Figure 40 Outputs of Extreme Conditions Run - 7

8. INIT nof_AF = 1075.5

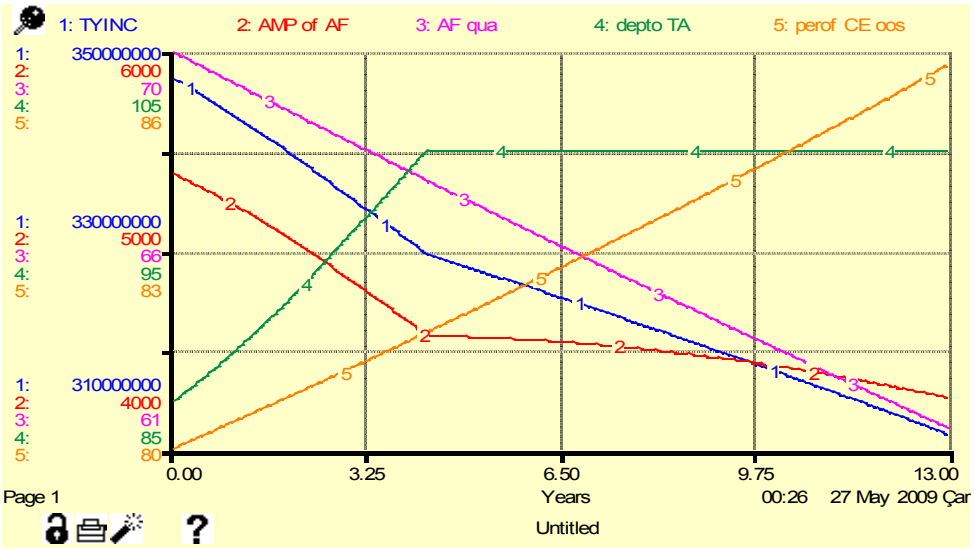


Figure 41 Outputs of Extreme Conditions Run - 8

9. INIT perof_CE_oos = 0

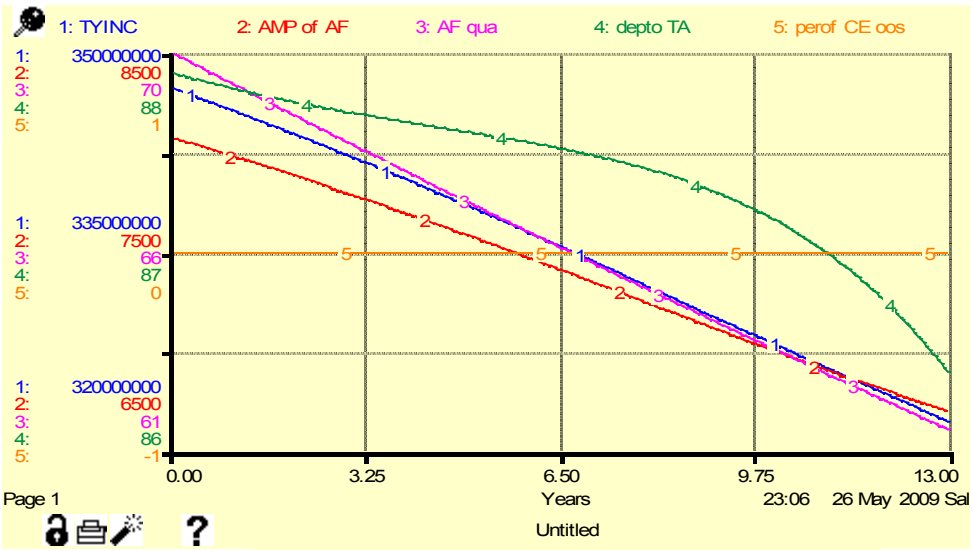


Figure 42 Outputs of Extreme Conditions Run - 9

10. INIT perof_CE_oos = 100

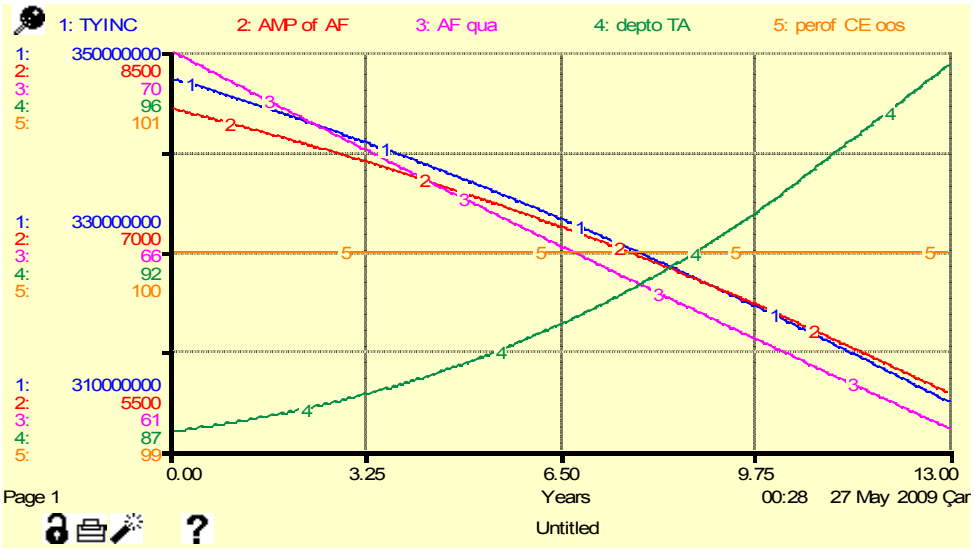


Figure 43 Outputs of Extreme Conditions Run - 10

11. INIT perof_QE = 0

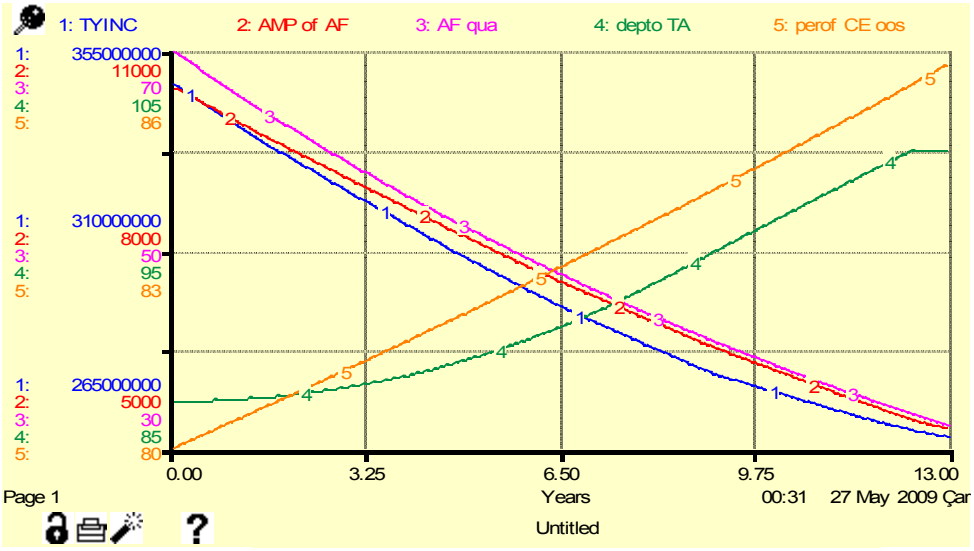


Figure 44 Outputs of Extreme Conditions Run - 11

12. INIT perof_QE = 100

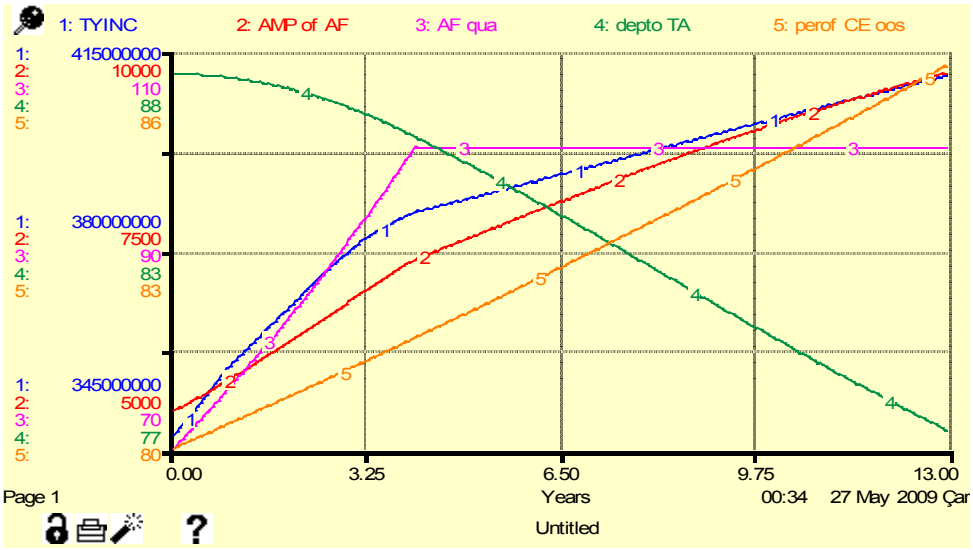
13. 

Figure 45 Outputs of Extreme Conditions Run - 12

APPENDIX G

CORROBORATIVE POLICY OUTCOMES

1. Baserun (No Action Alternative)

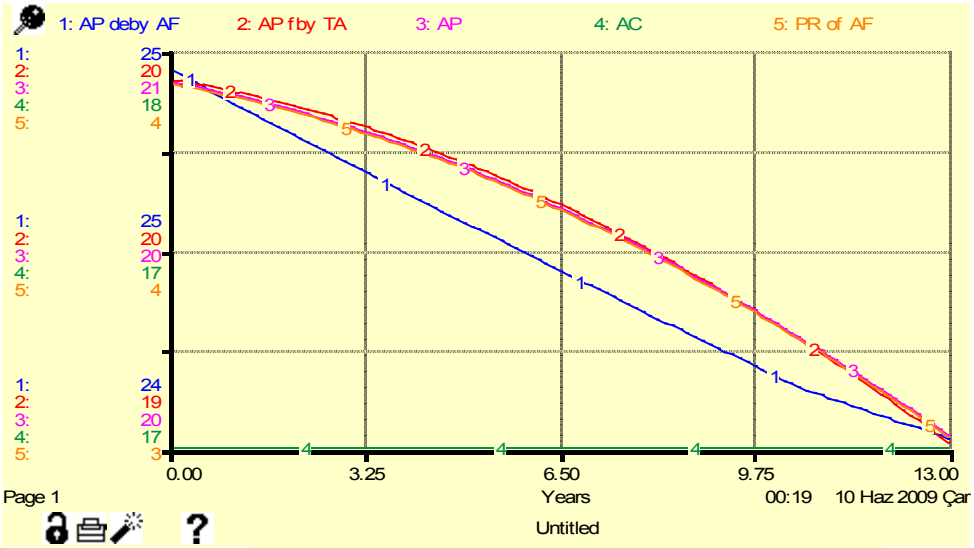


Figure 46 Ouputs of No Action Policy - 2

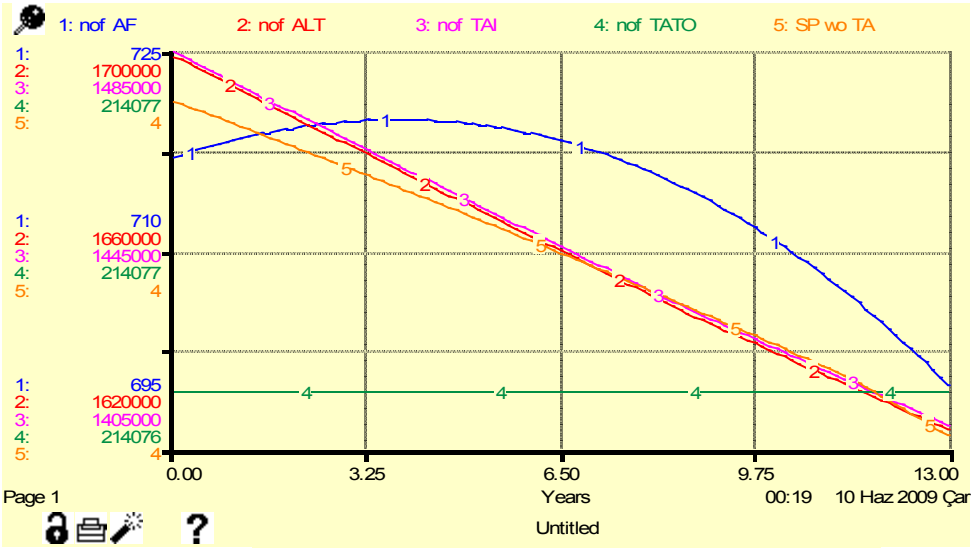


Figure 47 Ouputs of No Action Policy - 3

2. NAC Policy

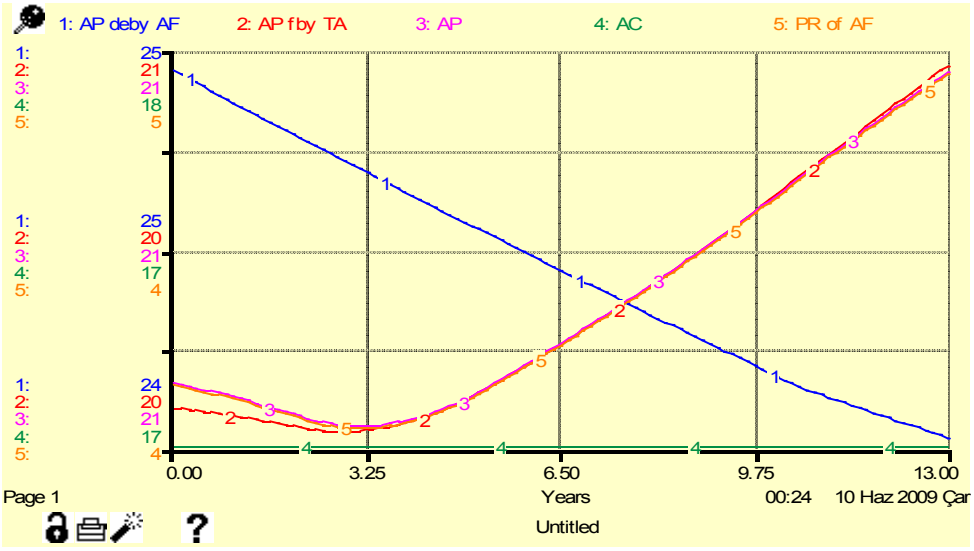


Figure 48 Ouputs of NAC Policy – 2

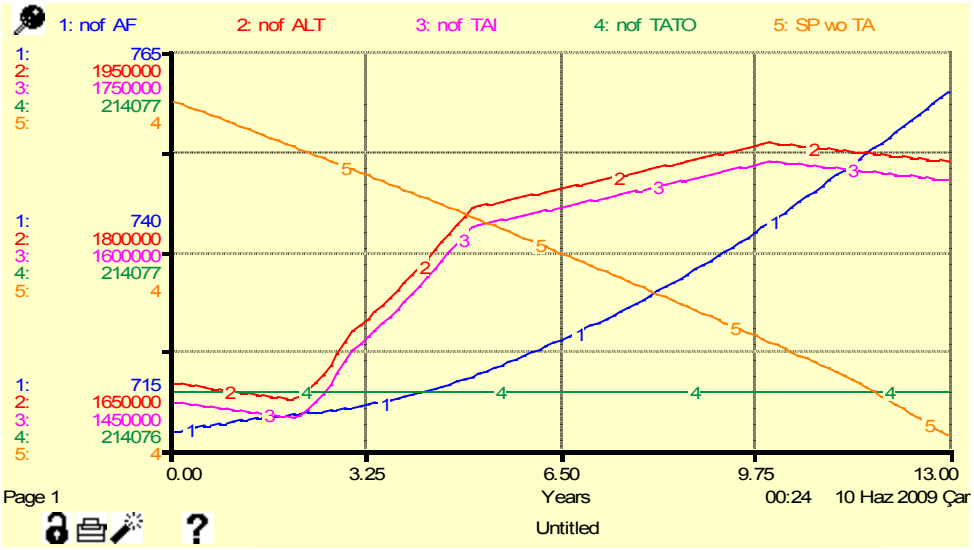


Figure 49 Ouputs of NAC Policy - 3

3. Increasing ATO Policy

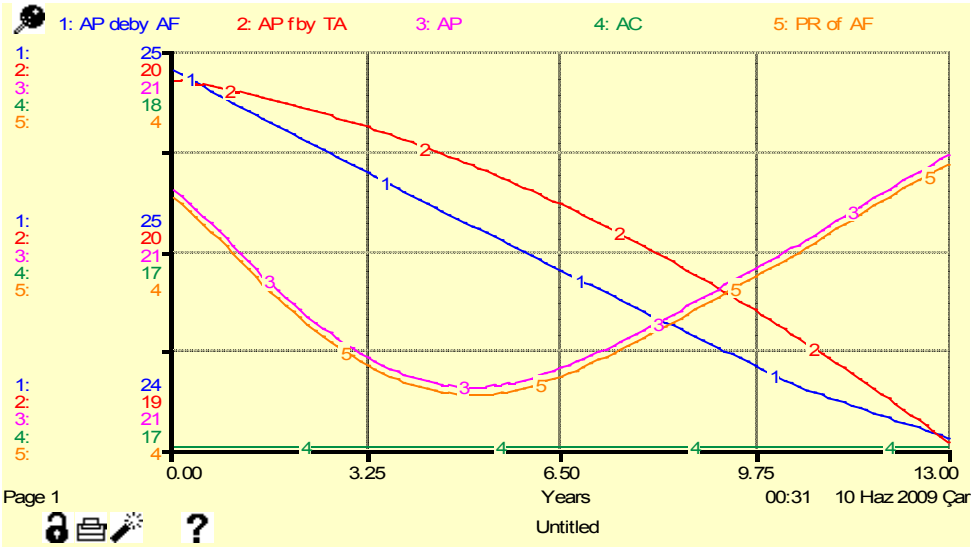


Figure 50 Outputs of Increasing ATO Policy - 2

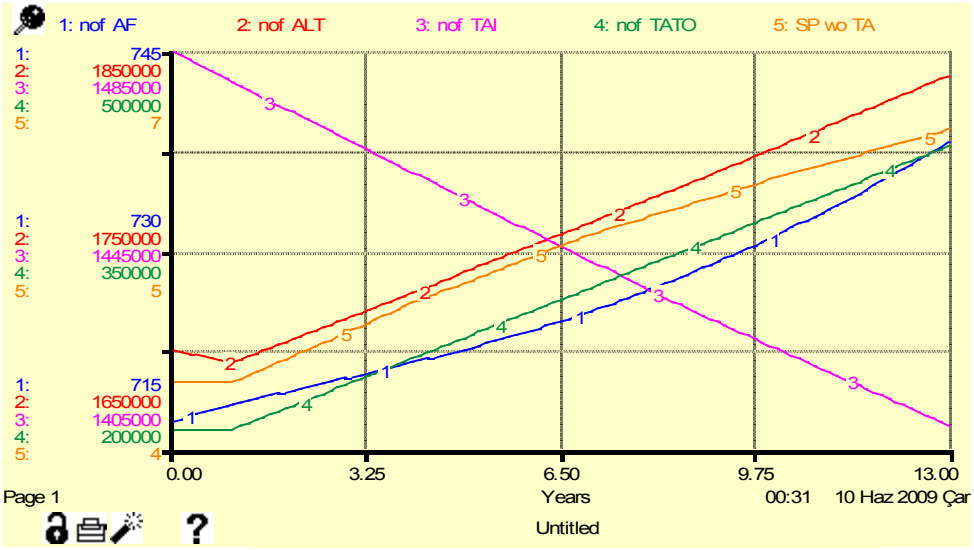


Figure 51 Outputs of Increasing ATO Policy - 3

4. Constructing a Unv Policy

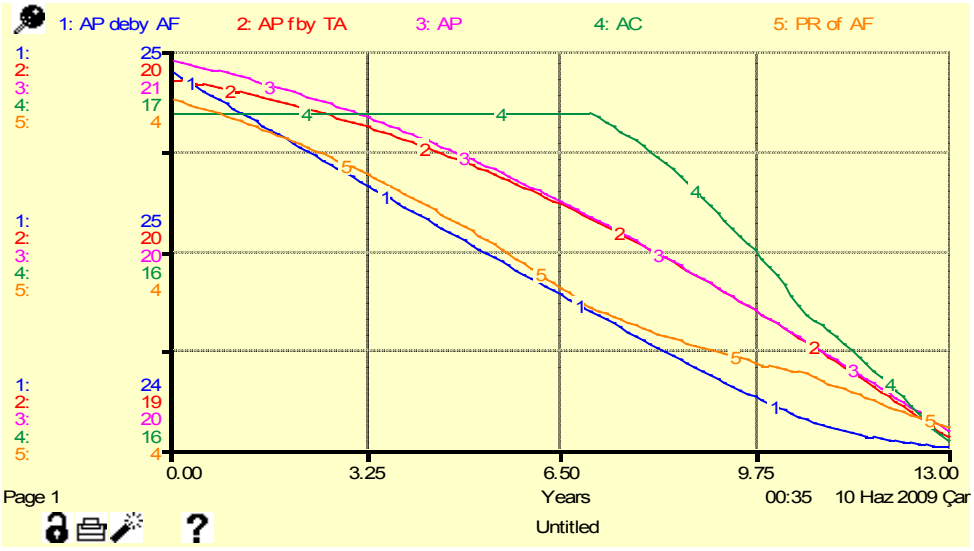


Figure 52 Outputs of Constructing a Unv Policy - 2

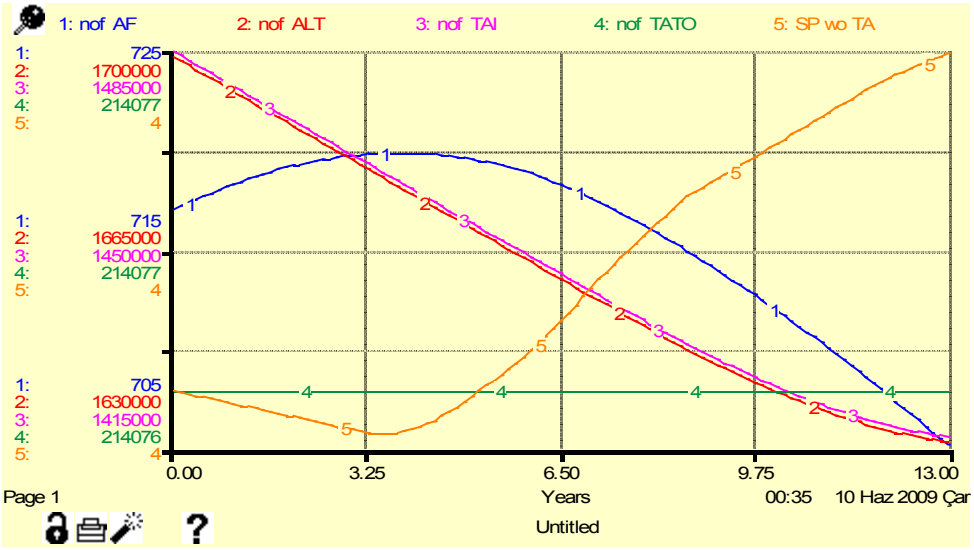


Figure 53 Outputs of Constructing a Unv Policy - 3

5. Increasing TEO Policy

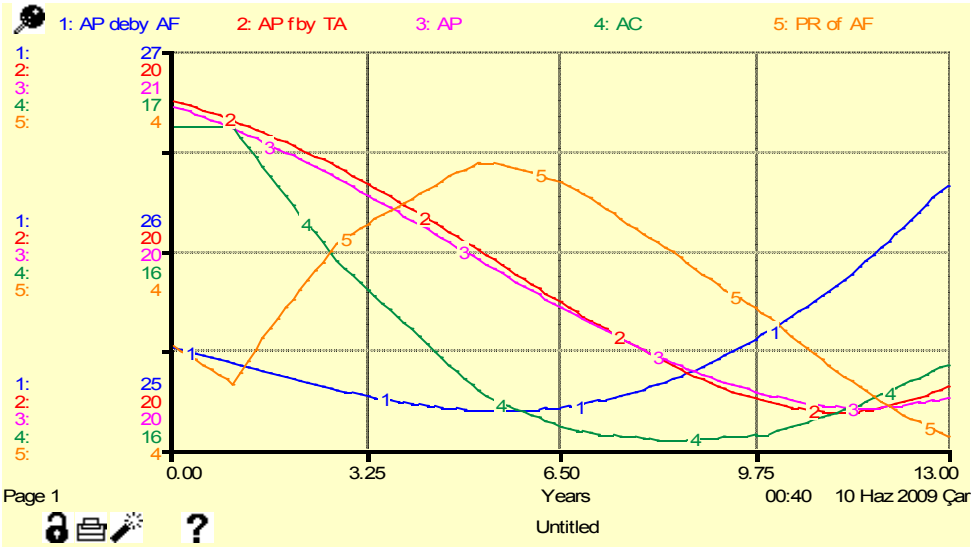


Figure 54 Outputs of Increasing TEO (Linearly) Policy - 2

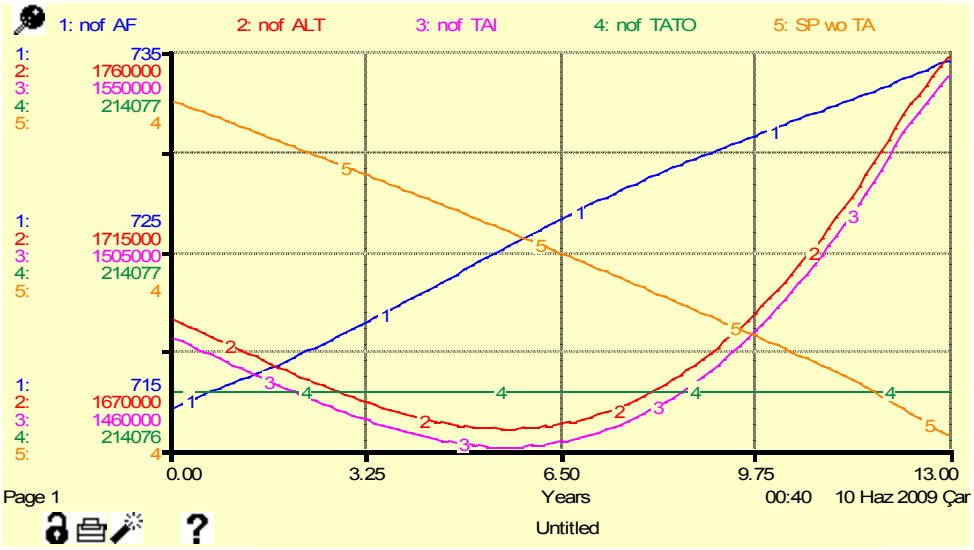


Figure 55 Outputs of Increasing TEO (Linearly) Policy - 3

6. Increasing PA Policy

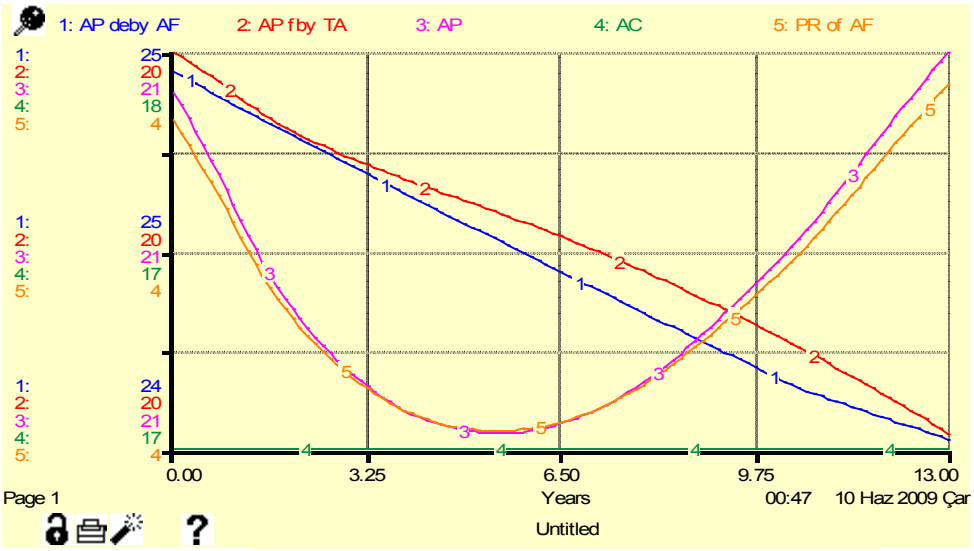


Figure 56 Outputs of Increasing PA (Linearly) Policy - 2

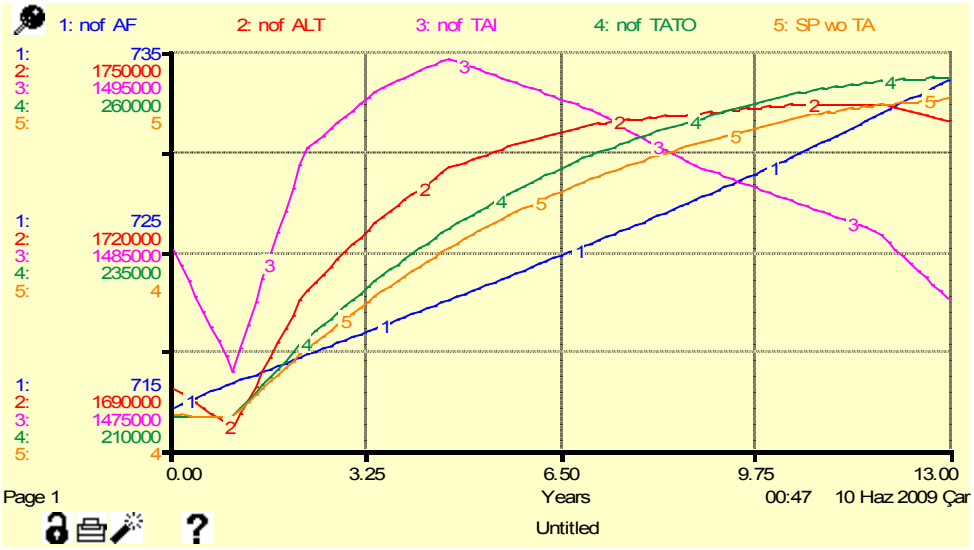


Figure 57 Outputs of Increasing PA (Linearly) Policy - 3

7. Establishing AIST Policy

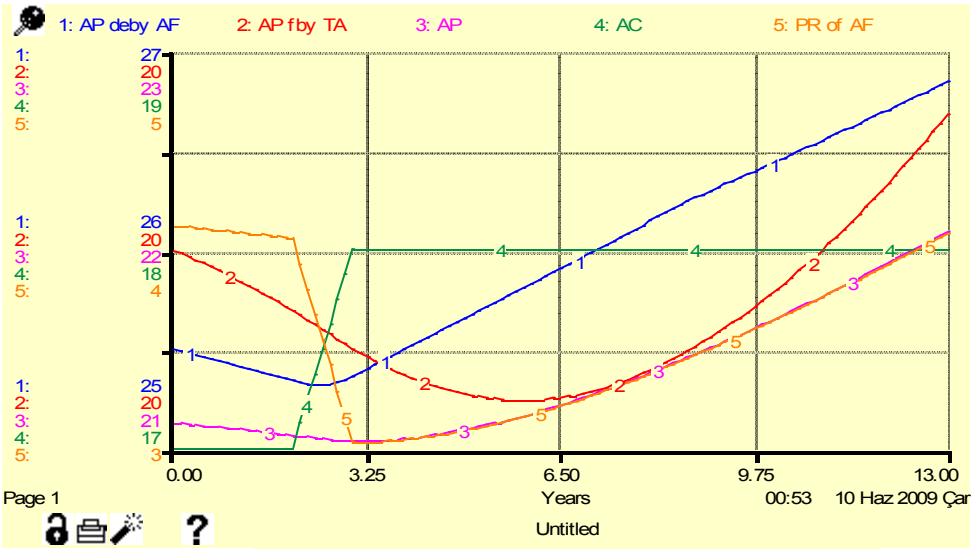


Figure 58 Outputs of Establishing AIST Policy - 2

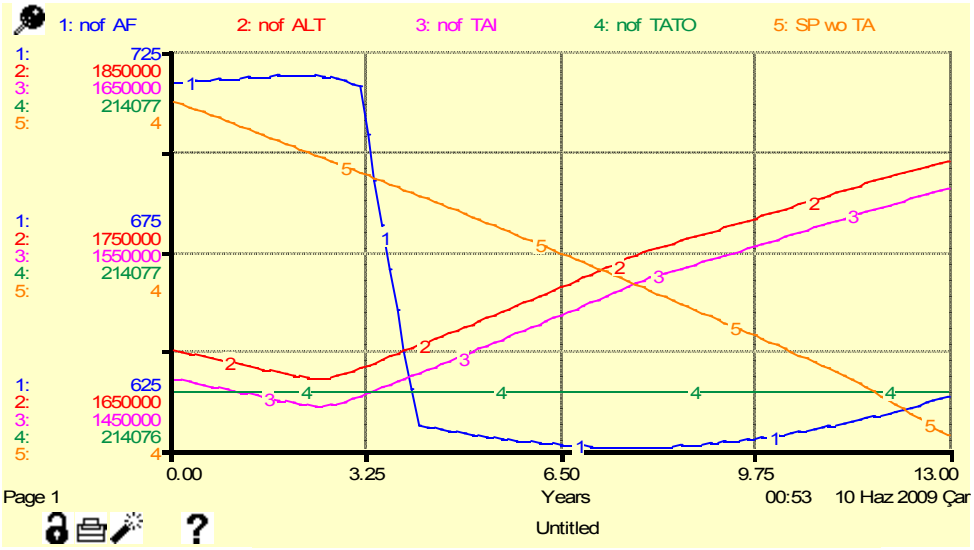


Figure 59 Outputs of Establishing AIST Policy - 3

8. Increasing TEO Policy (step)

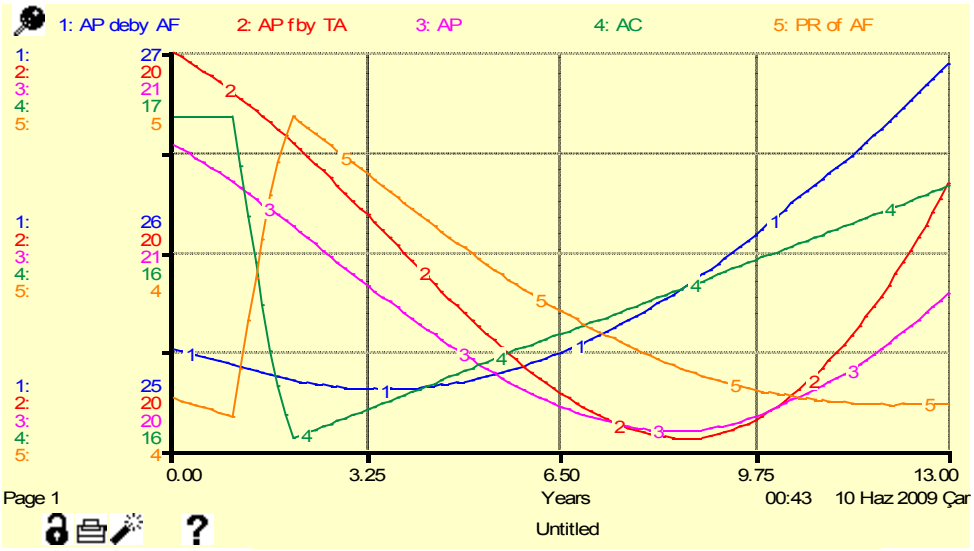


Figure 60 Outputs of Increasing TEO (Step) Policy - 2

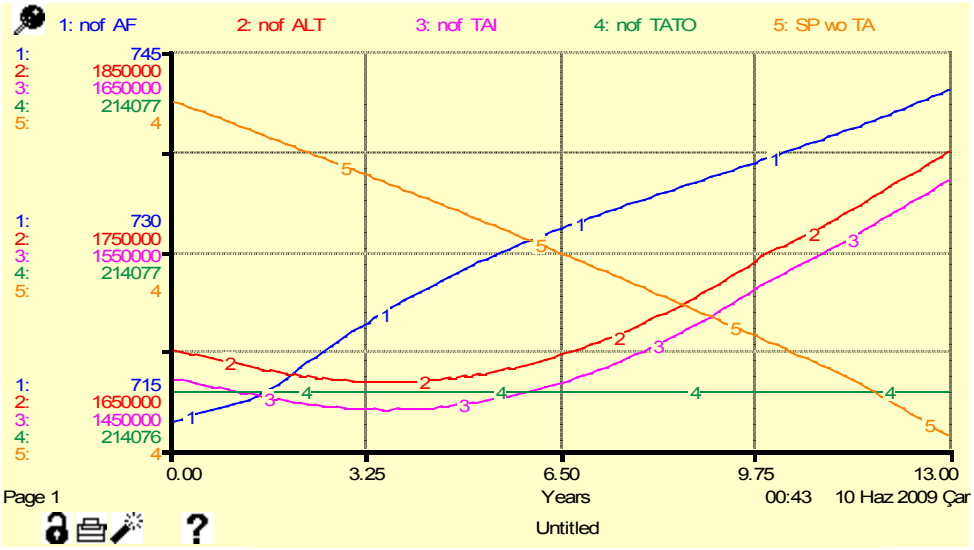


Figure 61 Outputs of Increasing TEO (Step) Policy - 3

9. Increasing PA Policy (step)

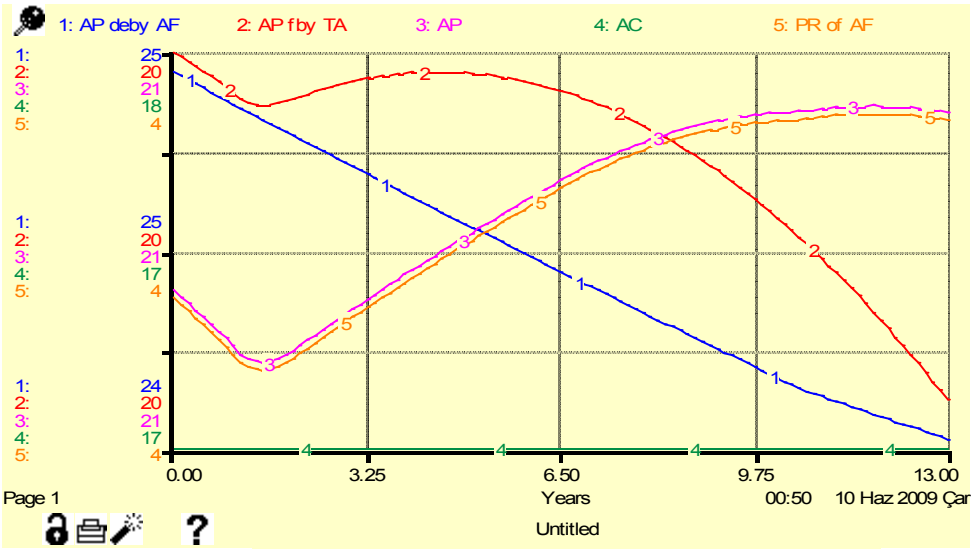


Figure 62 Outputs of Increasing PA (Step) Policy - 2

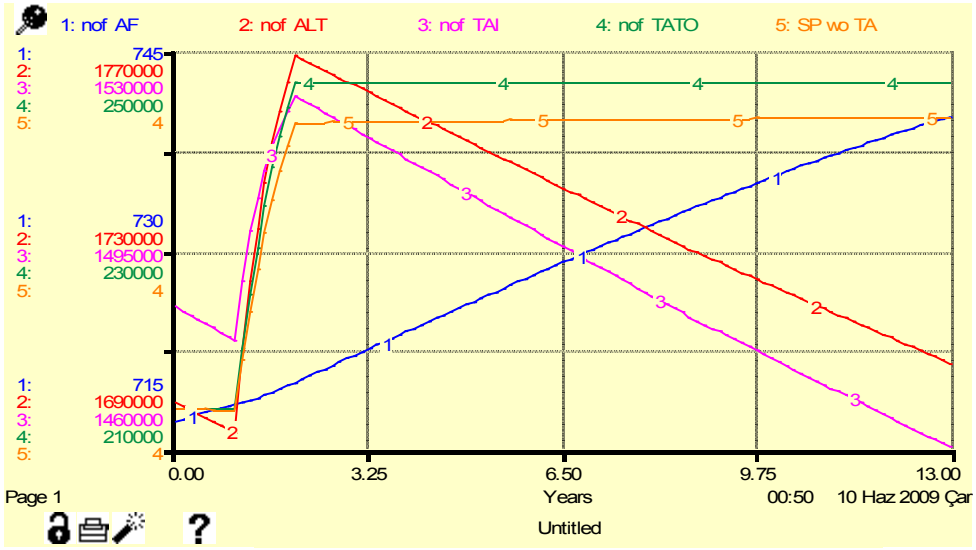


Figure 63 Outputs of Increasing PA (Step) Policy - 3

10. Increasing ATO and TEO Policy

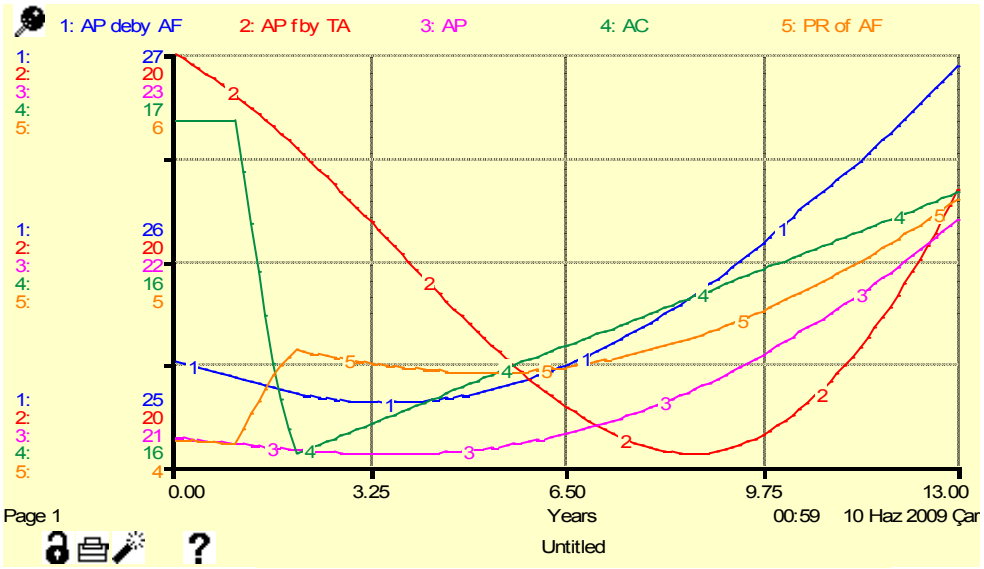


Figure 64 Outputs of Increasing ATO and TEO Policy - 2

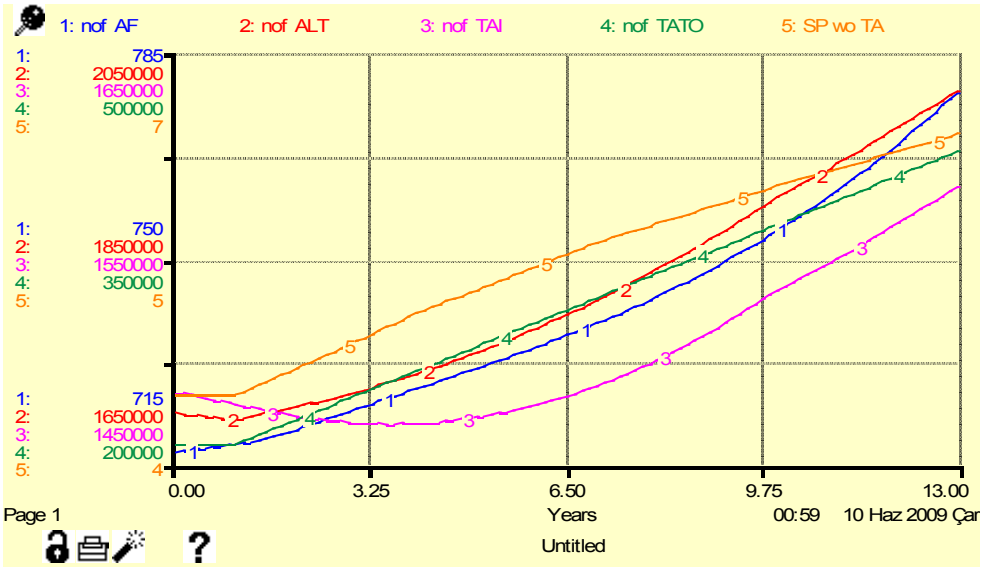


Figure 65 Outputs of Increasing ATO and TEO Policy - 3

11. NAC and Establishing AIST Policy

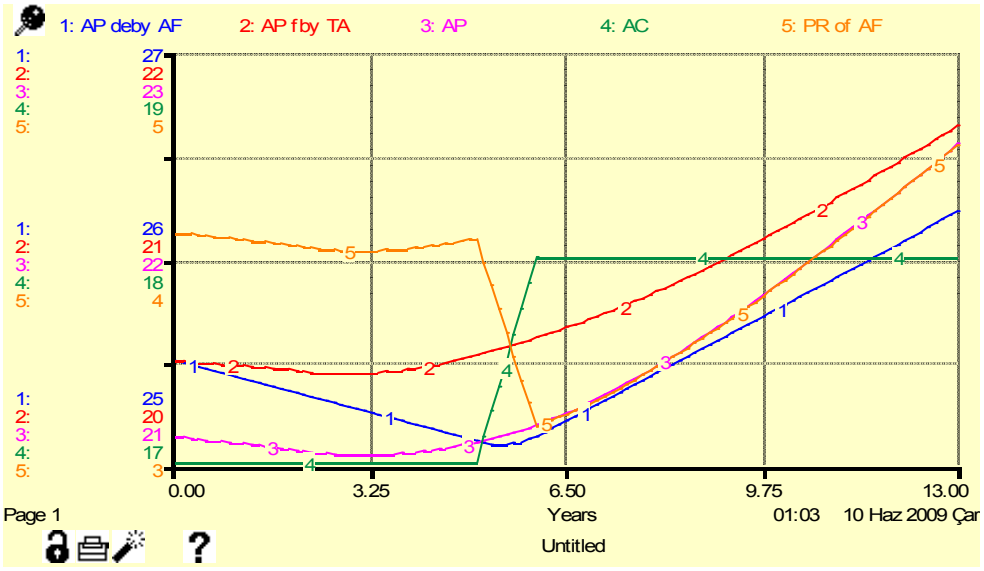


Figure 66 Outputs of NAC and Establishing AIST Policy - 2

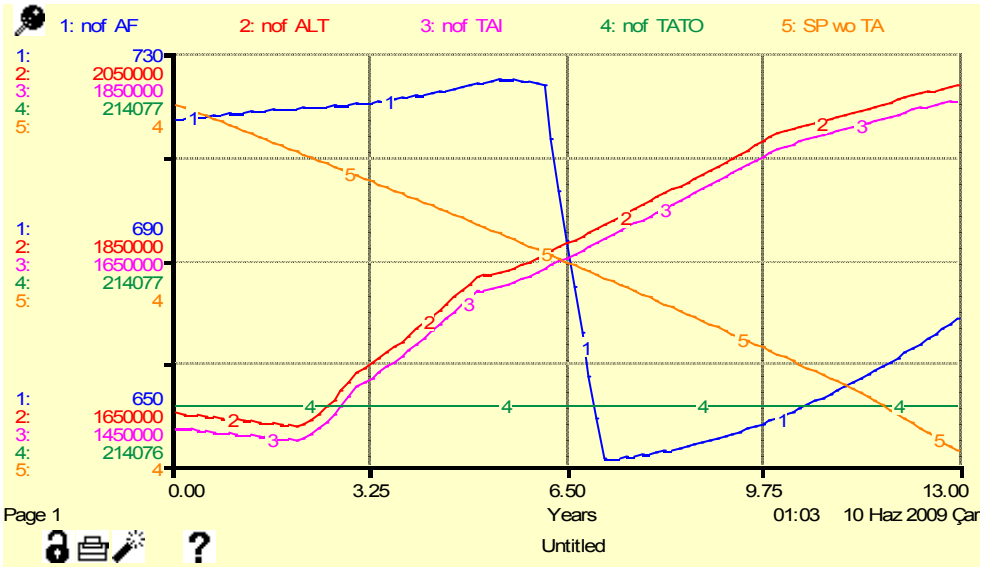


Figure 67 Outputs of NAC and Establishing AIST Policy - 3

12. Increasing PA and Constructing a Unv Policy

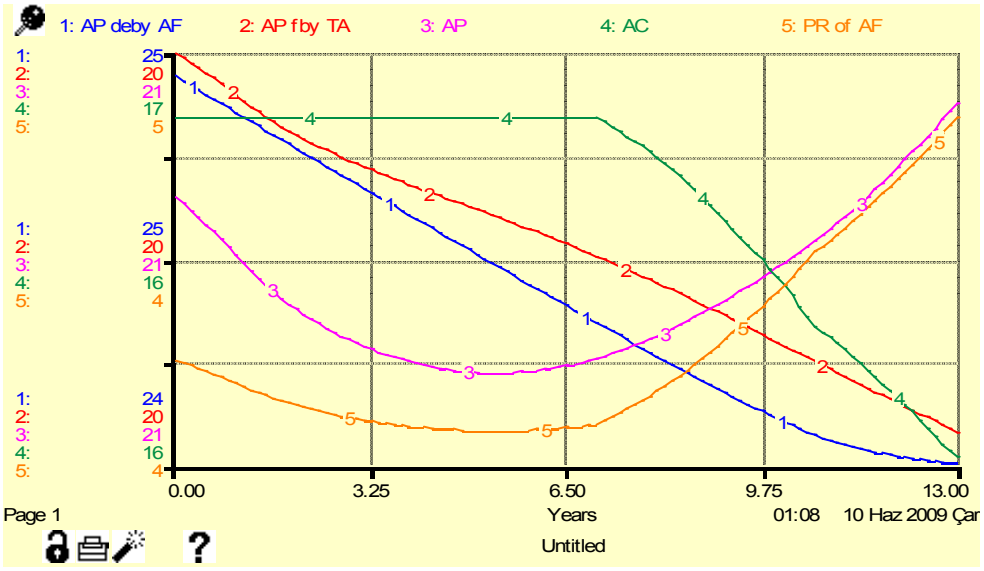


Figure 68 Outputs of Increasing PA and Constructing a Unv Policy - 2

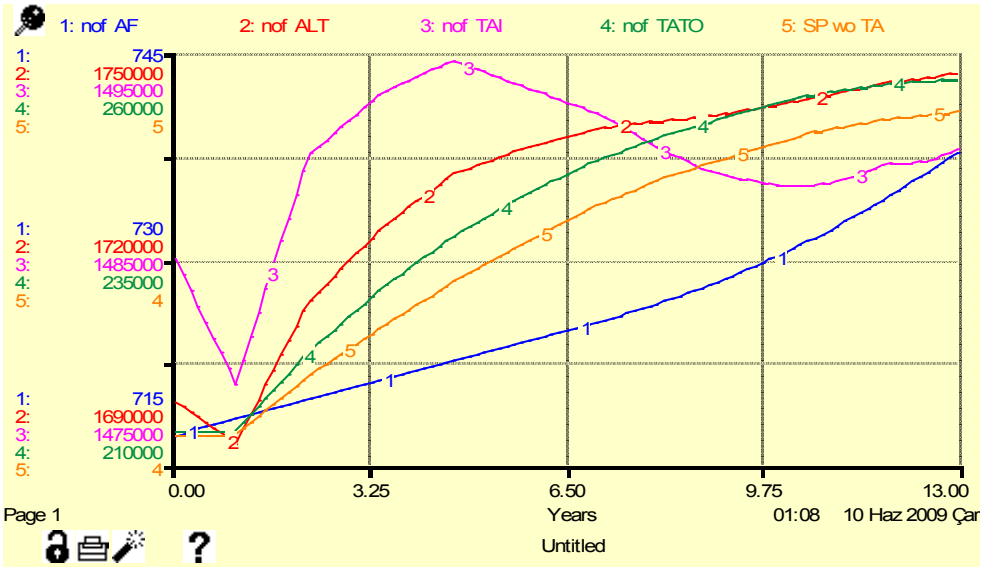


Figure 69 Outputs of Increasing PA and Constructing a Unv Policy - 3

13. Increasing ATO, NAC and Establishing AIST Policy

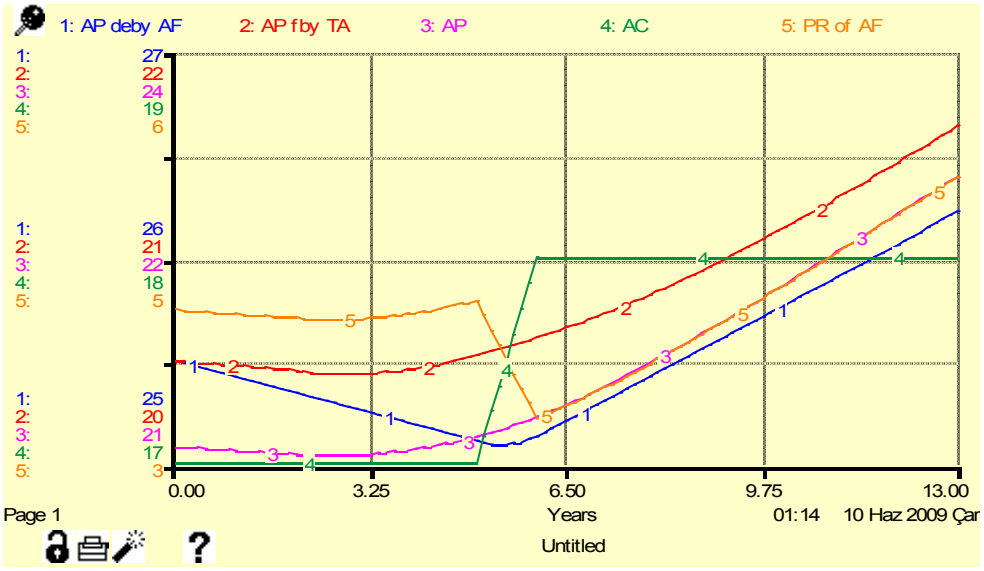


Figure 70 Outputs of Increasing ATO, NAC and Establishing AIST Policy - 2

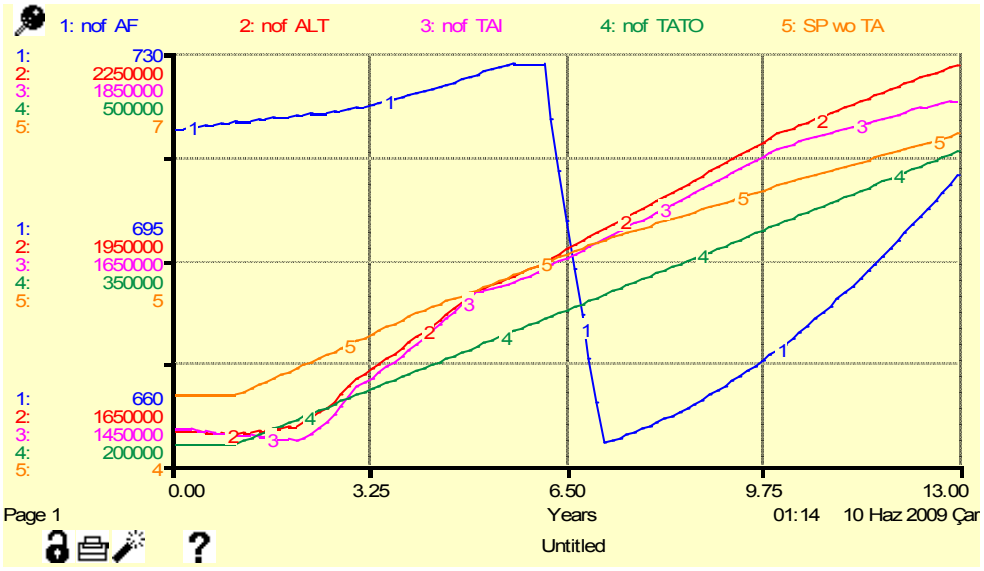


Figure 71 Outputs of Increasing ATO, NAC and Establishing AIST Policy - 3

14. Constructing a Unv, Increasing PA and TEO Policy

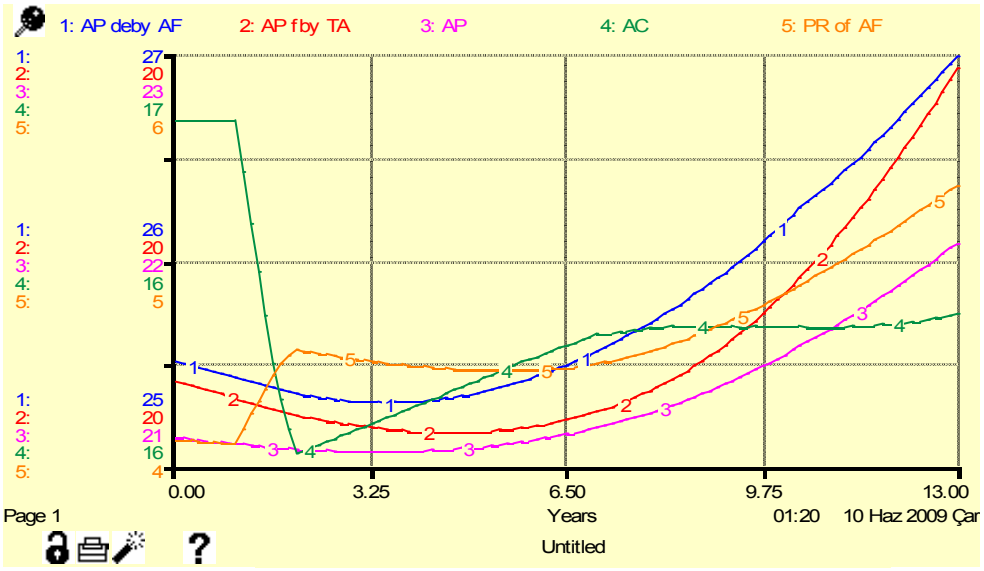


Figure 72 Outputs of Constructing a Unv, Increasing PA and TEO Policy - 2

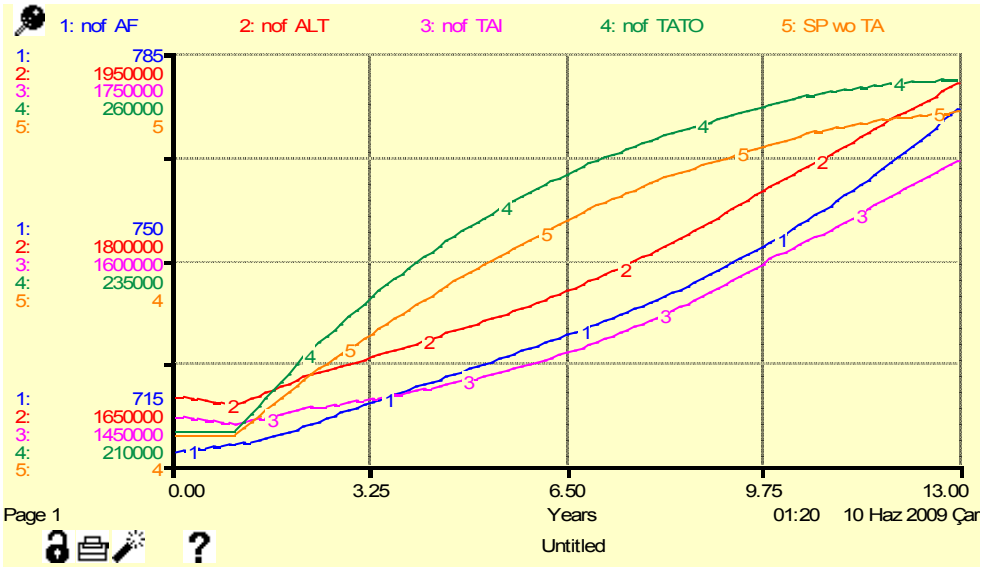


Figure 73 Outputs of Constructing a Unv, Increasing PA and TEO Policy - 3

APPENDIX H

SENSITIVITY ANALYSIS RESULTS

1. Changing parameters

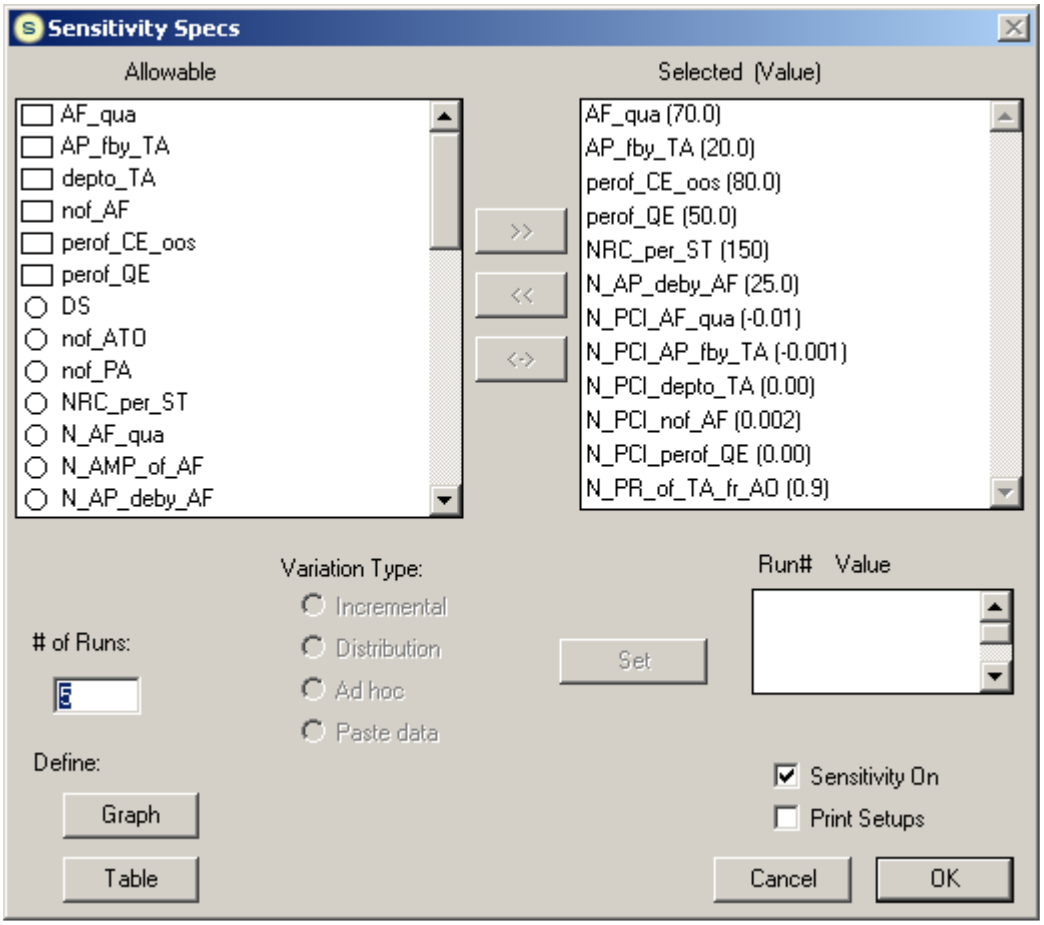


Figure 74 List of Selected Variables for Sensitivity Testing

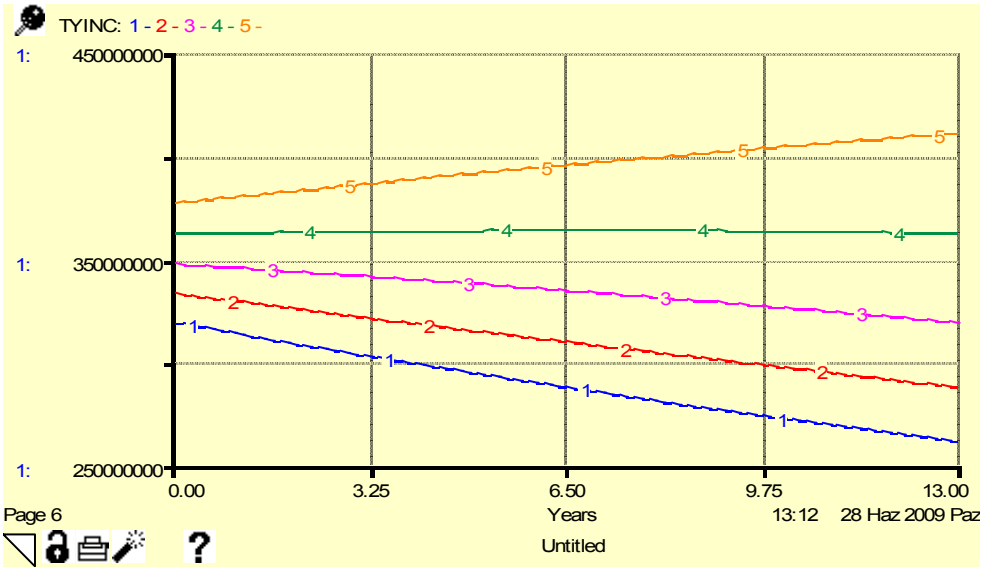


Figure 75 Sensitivity Run for TYINC in No Action Conditions

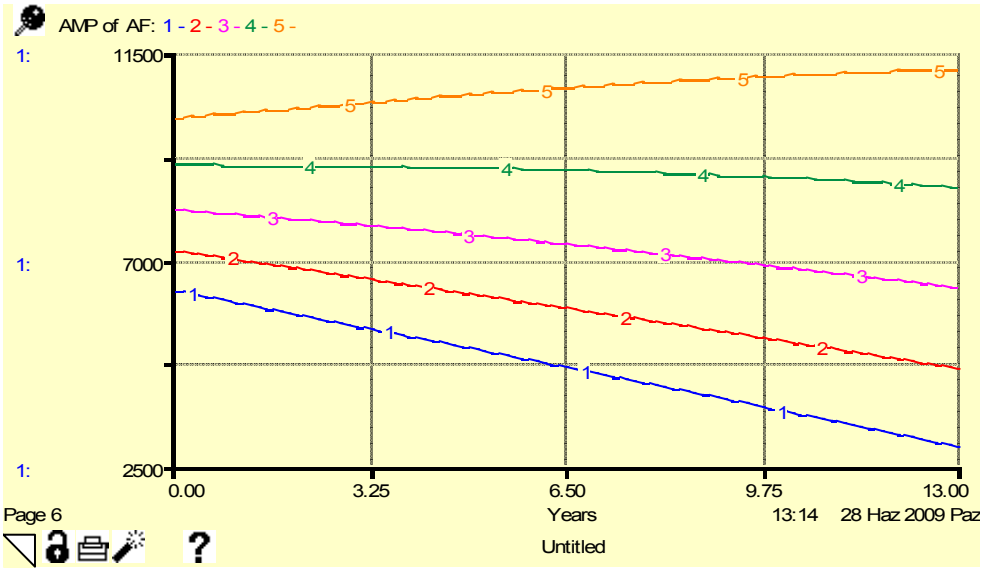


Figure 76 Sensitivity Run for AMP of AF in No Action Conditions

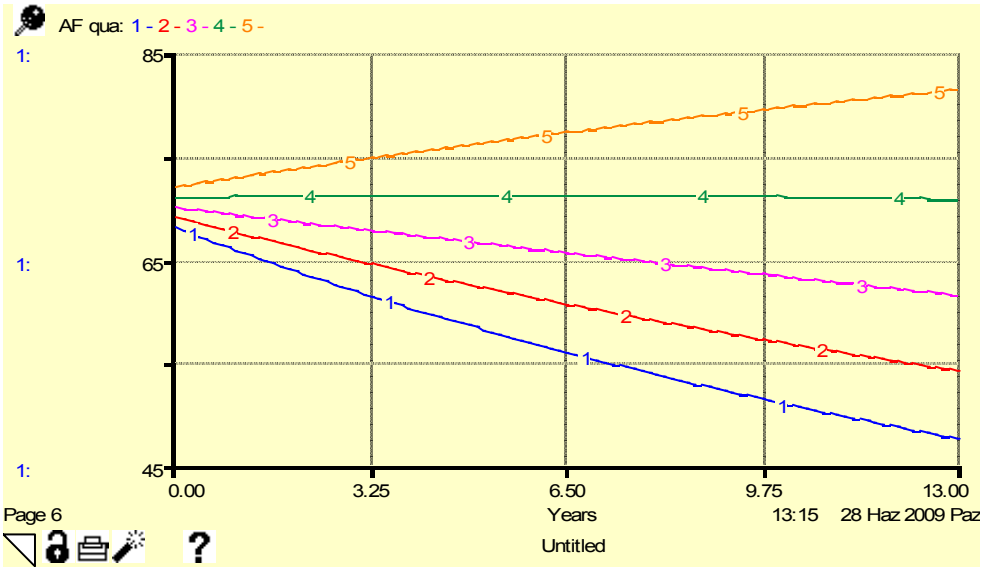


Figure 77 Sensitivity Run for AF qua in No Action Conditions

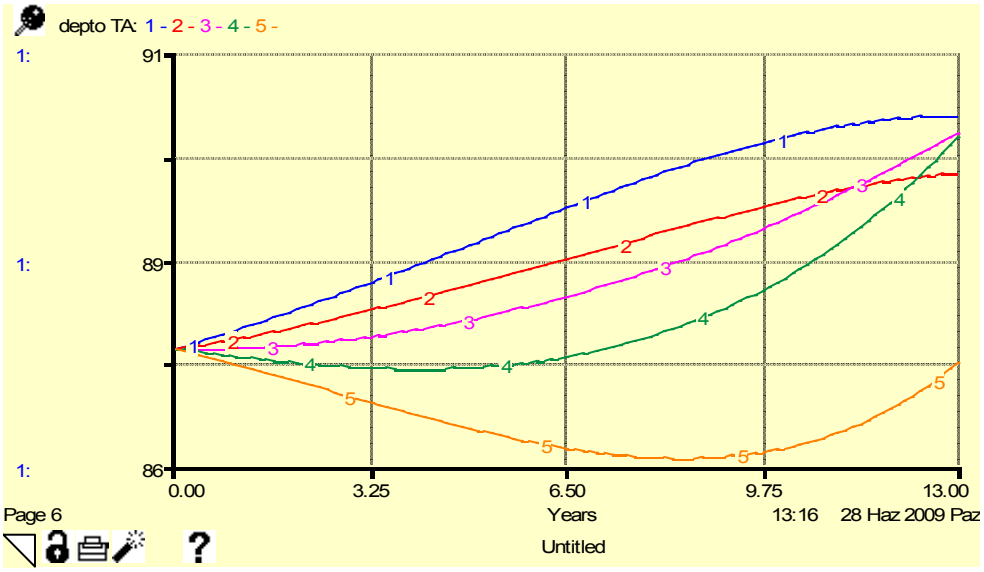


Figure 78 Sensitivity Run for depto TA in No Action Conditions

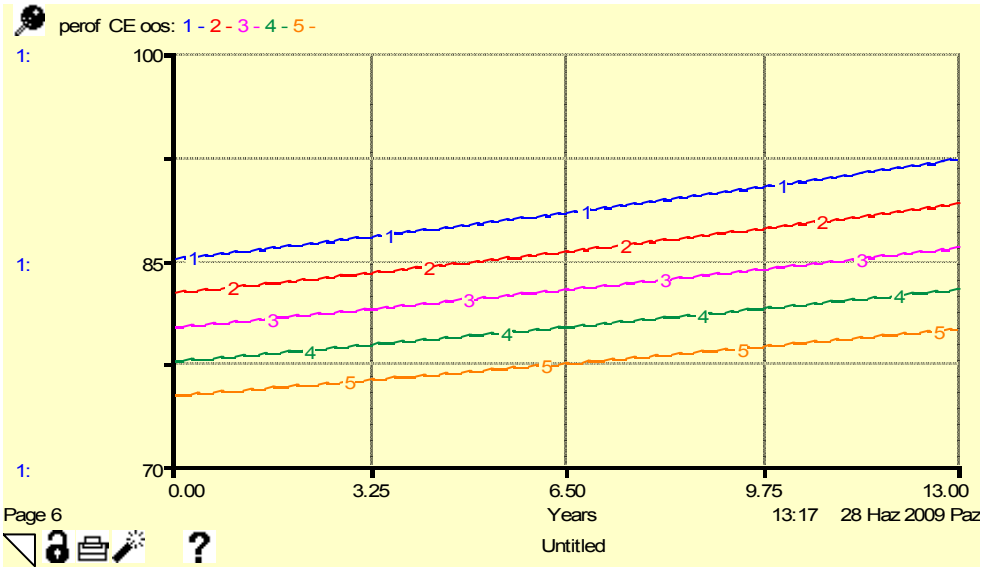


Figure 79 Sensitivity Run for perof CE oos in No Action Conditions

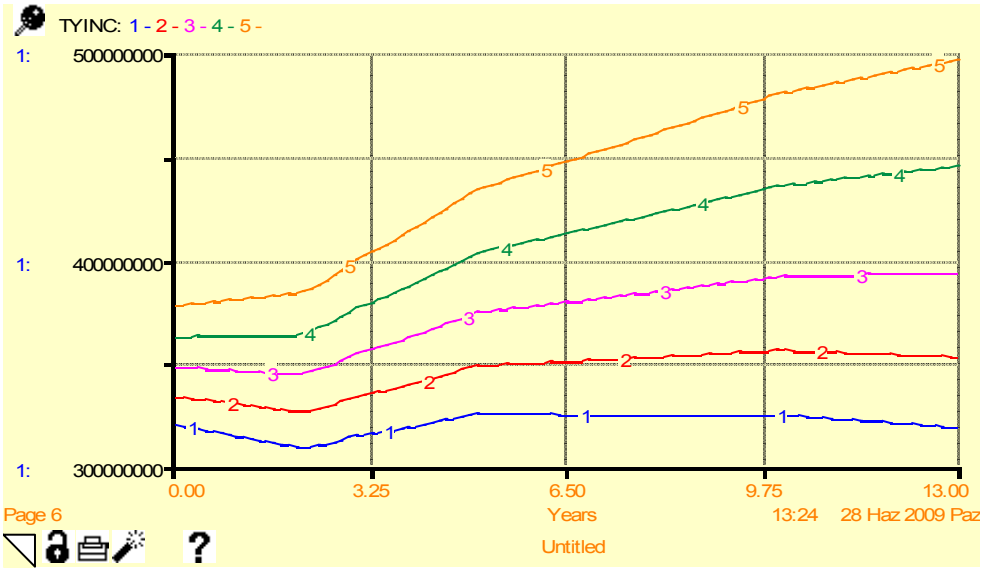


Figure 80 Sensitivity Run for TYINC with NAC Policy

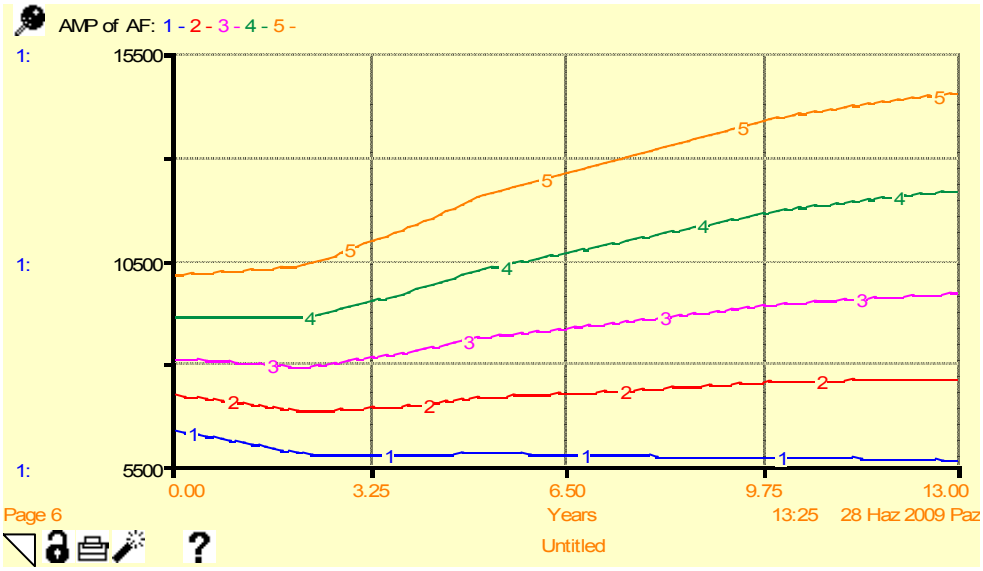


Figure 81 Sensitivity Run for AMP of AF with NAC Policy

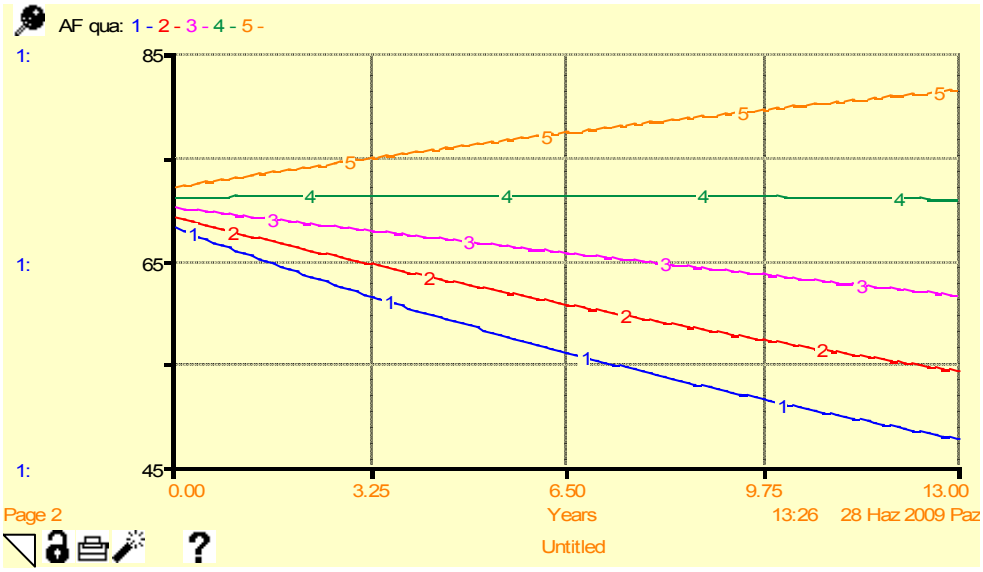


Figure 82 Sensitivity Run for AF qua with NAC Policy

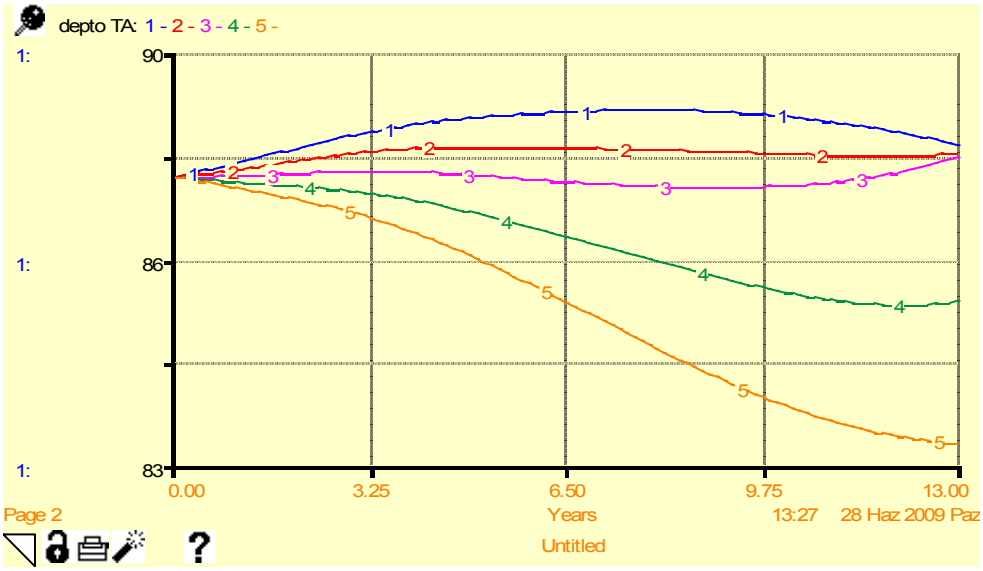


Figure 83 Sensitivity Run for depto TA with NAC Policy

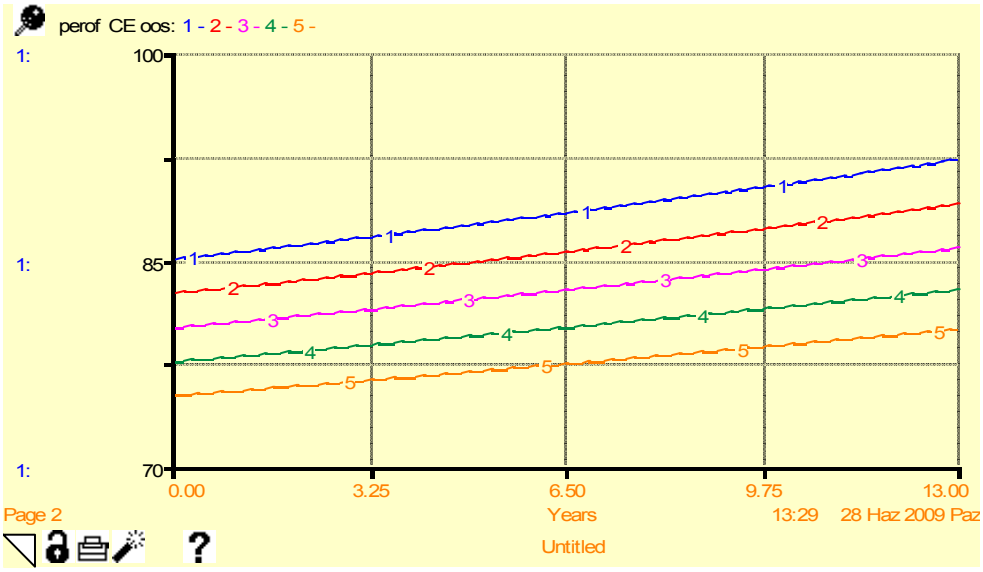


Figure 84 Sensitivity Run for perof CE oos with NAC Policy

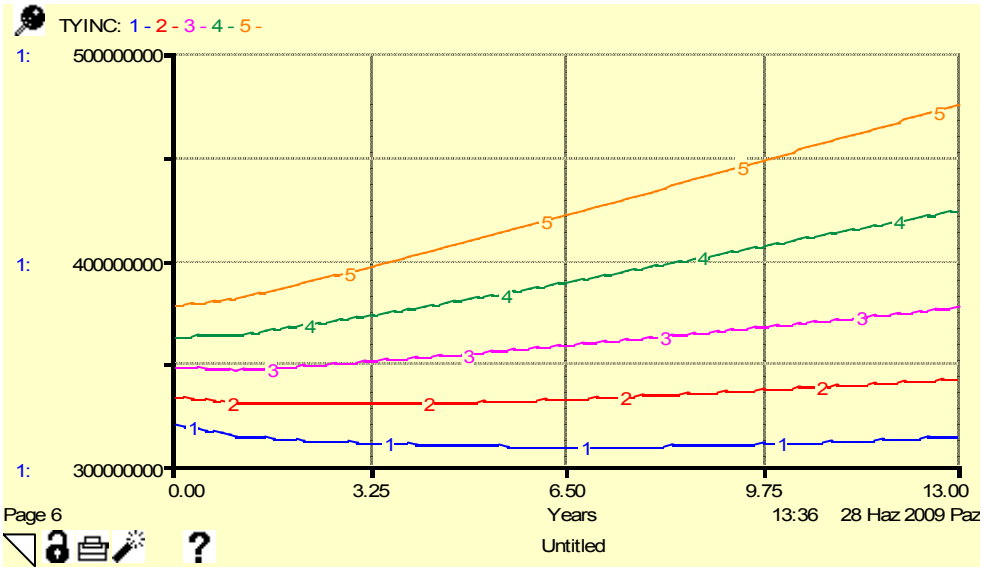


Figure 85 Sensitivity Run for TYINC with ATO Policy

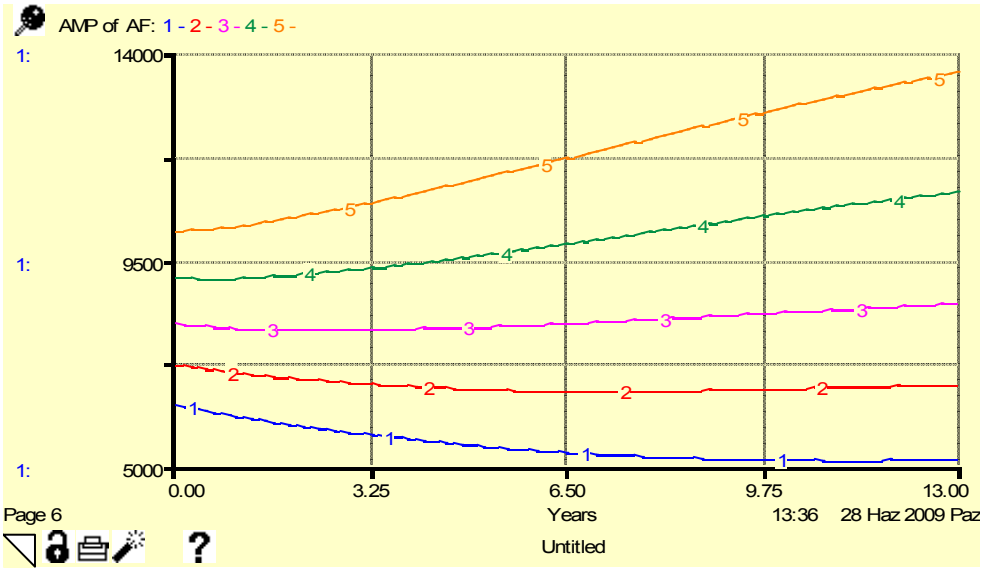


Figure 86 Sensitivity Run for AMP of AF with ATO Policy

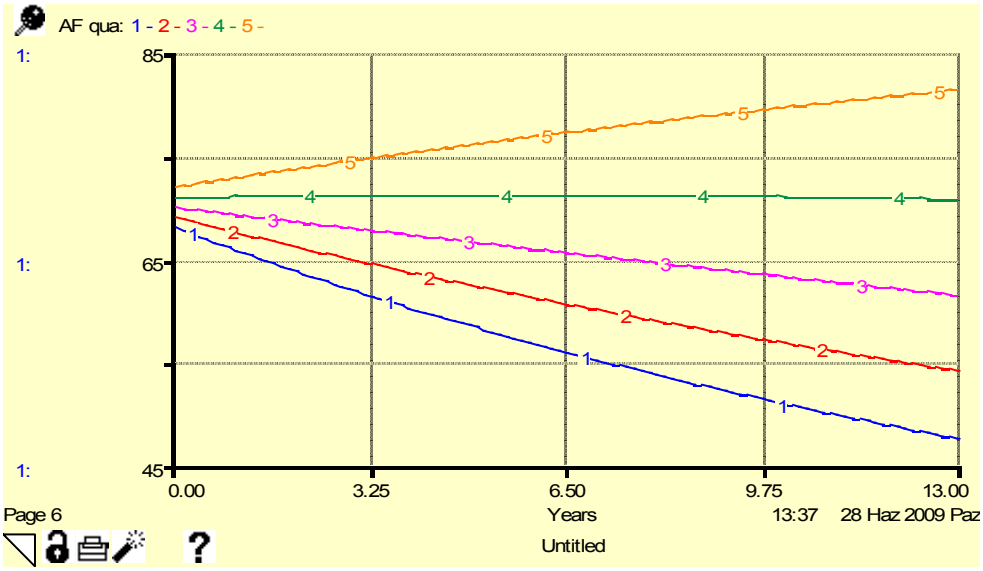


Figure 87 Sensitivity Run for AF qua with ATO Policy

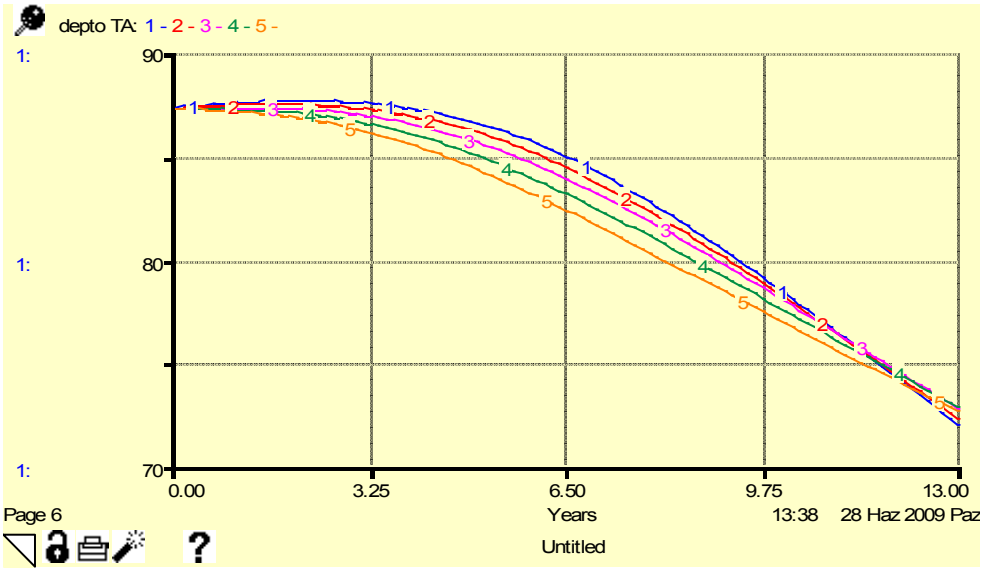


Figure 88 Sensitivity Run for depto TA with ATO Policy

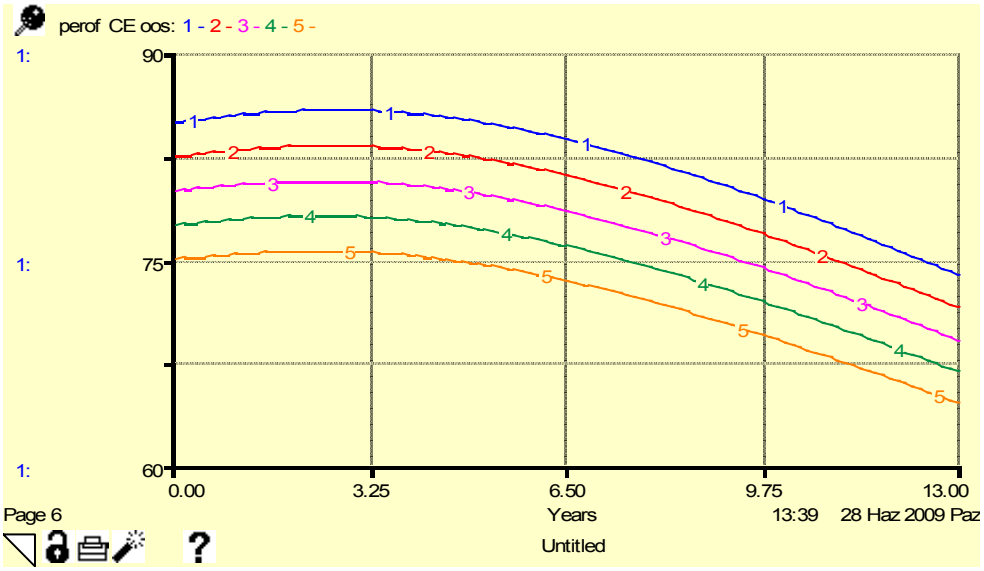


Figure 89 Sensitivity Run for perof CE oos with ATO Policy

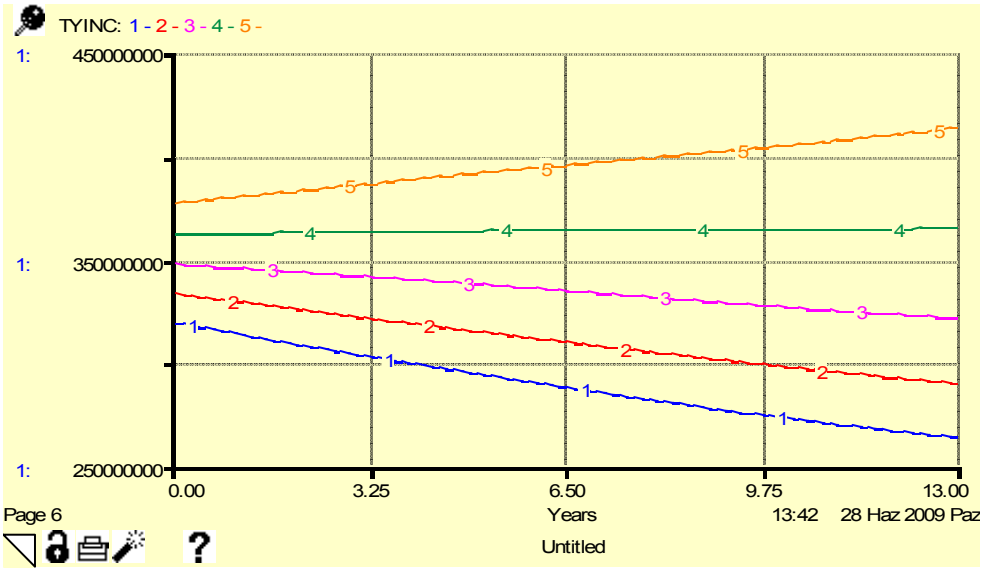


Figure 90 Sensitivity Run for TYINC with Univ Policy

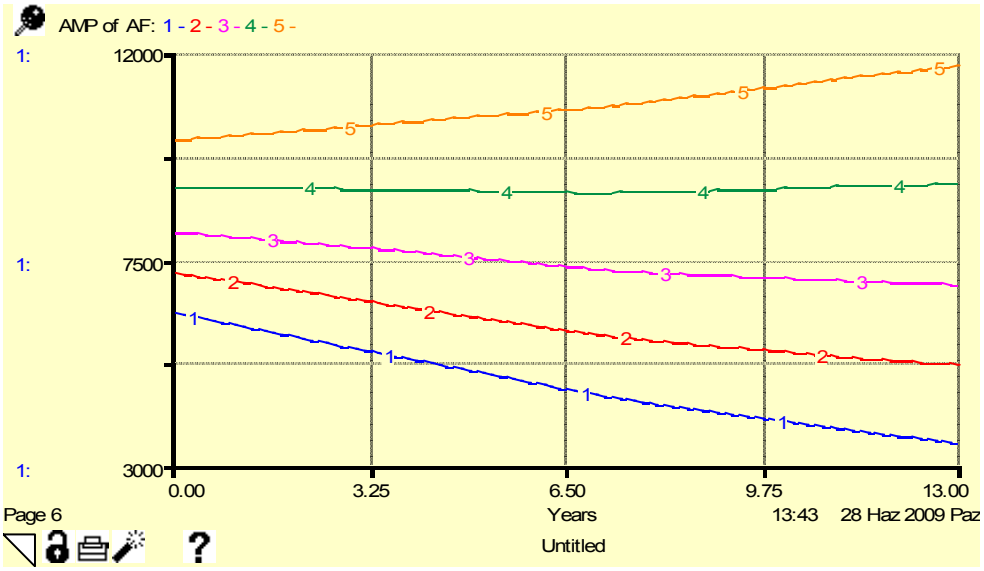


Figure 91 Sensitivity Run for AMP of AF with Univ Policy

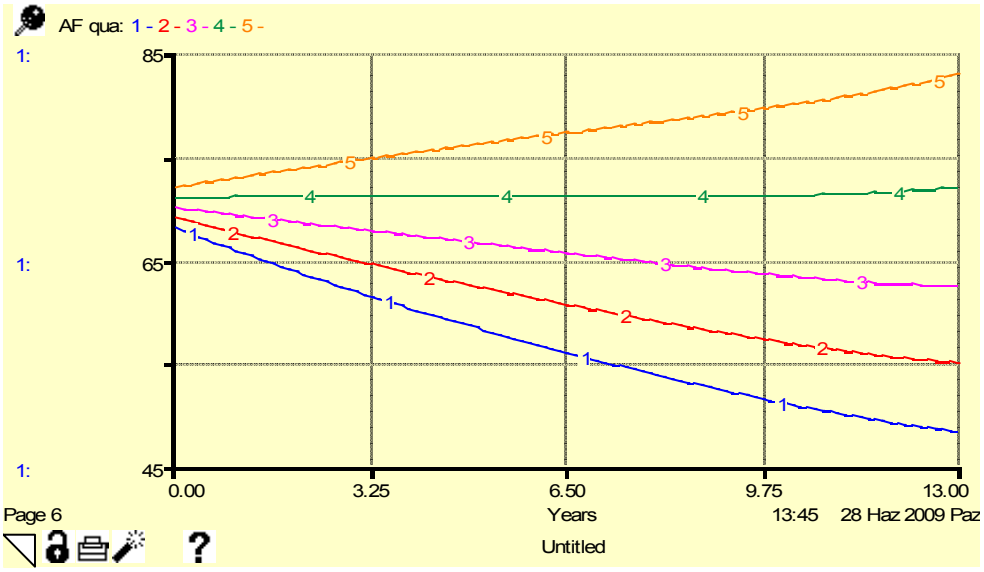


Figure 92 Sensitivity Run for AF qua with Univ Policy

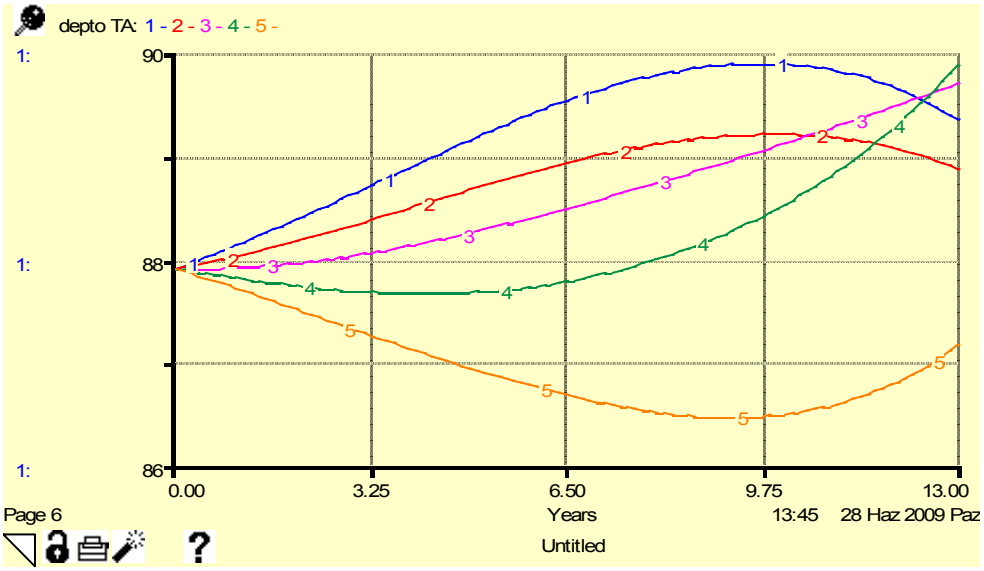


Figure 93 Sensitivity Run for depto TA with Univ Policy

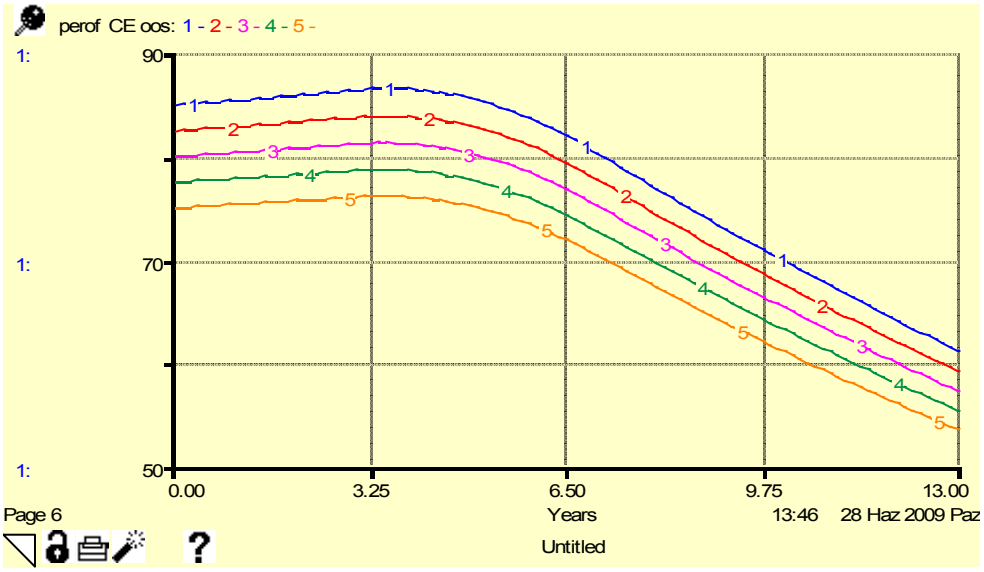


Figure 94 Sensitivity Run for perof CE oos with Univ Policy

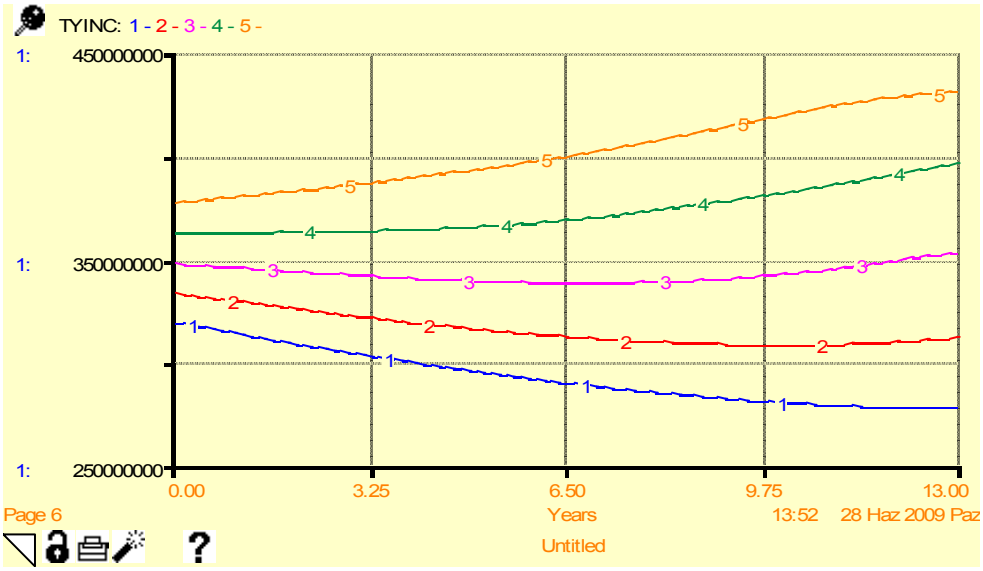


Figure 95 Sensitivity Run for TYINC with TEO Policy

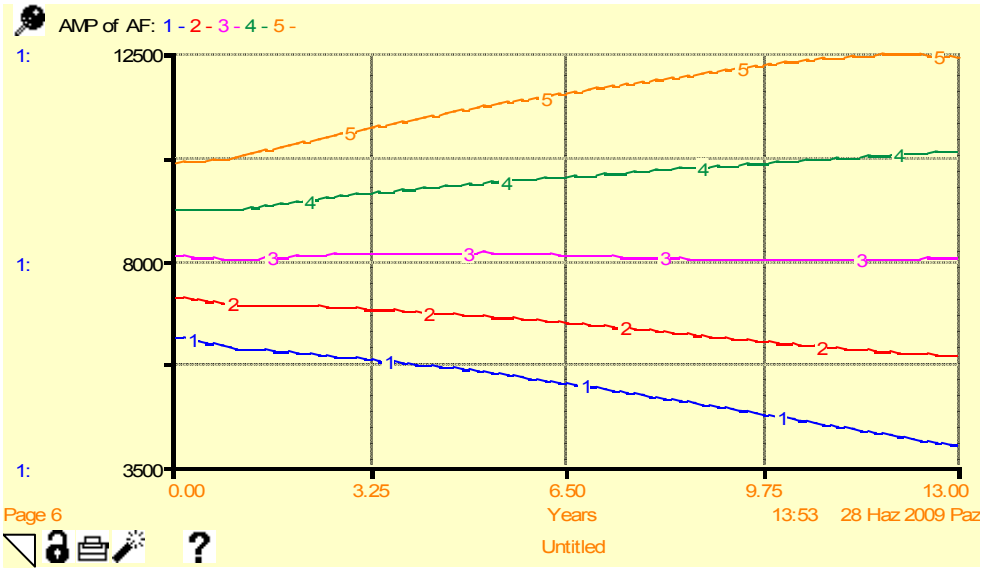


Figure 96 Sensitivity Run for AMP of AF with TEO Policy

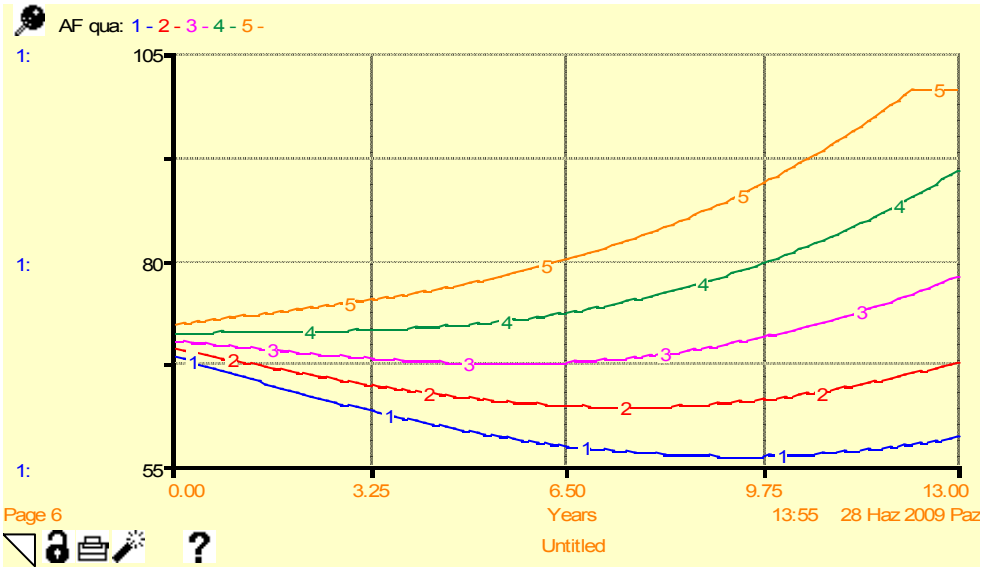


Figure 97 Sensitivity Run for AF qua with TEO Policy

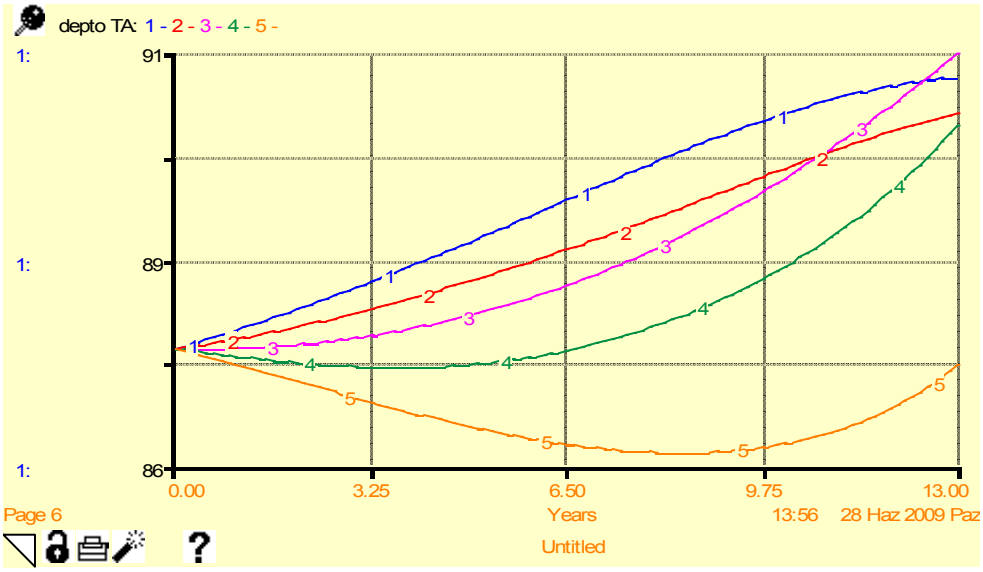


Figure 98 Sensitivity Run for depto TA with TEO Policy

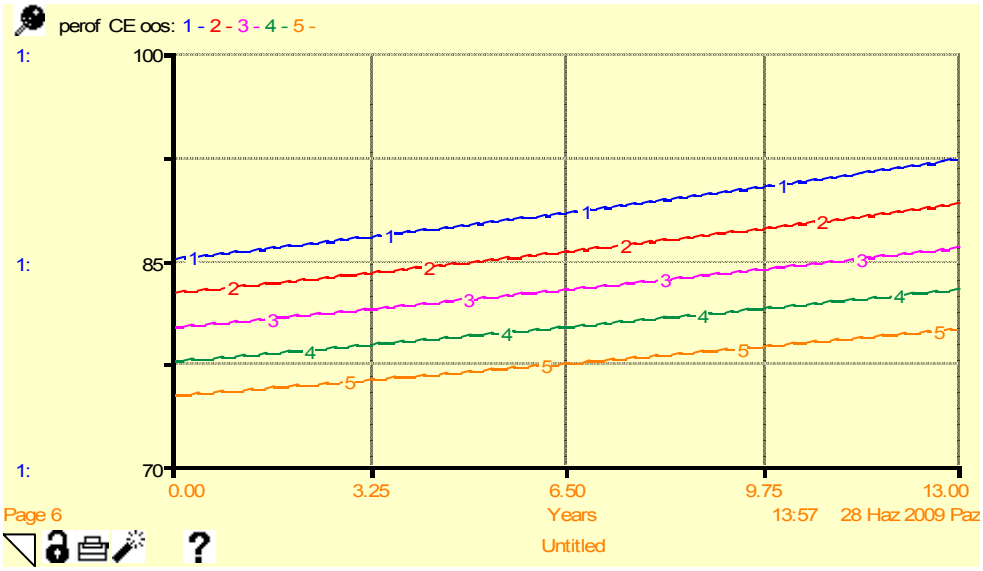


Figure 99 Sensitivity Run for perof CE oos with TEO Policy

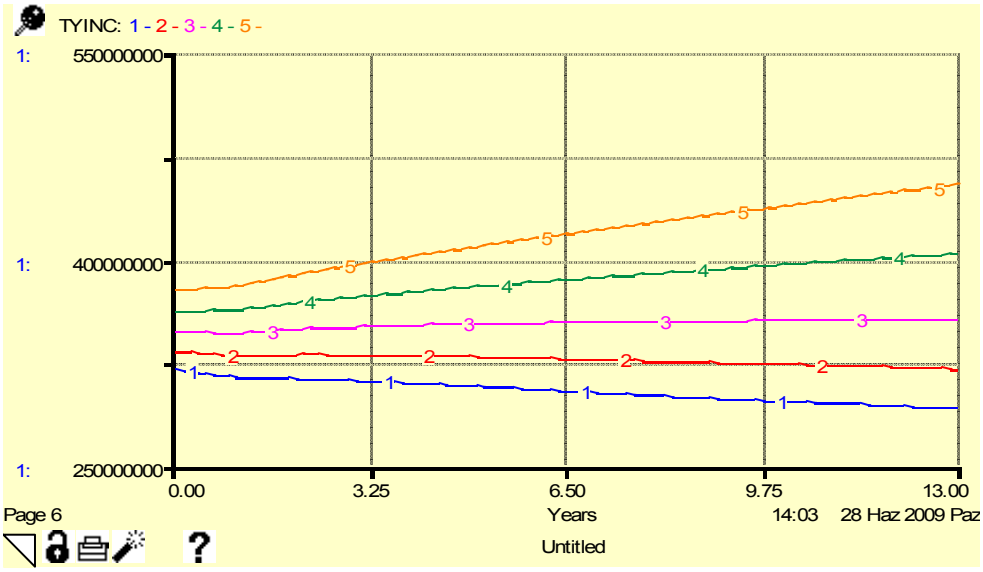


Figure 100 Sensitivity Run for TYINC with PA Policy

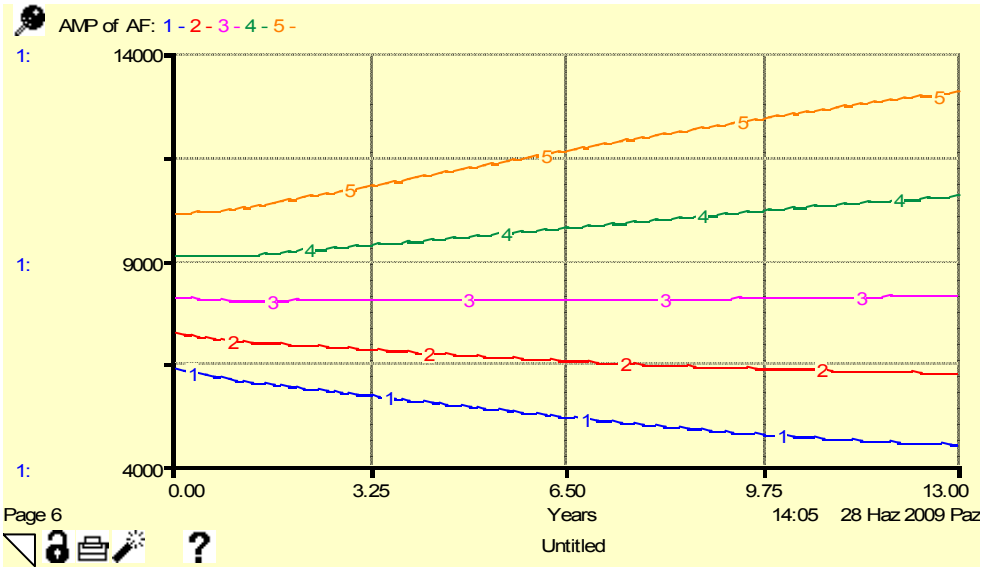


Figure 101 Sensitivity Run for AMP of AF with PA Policy

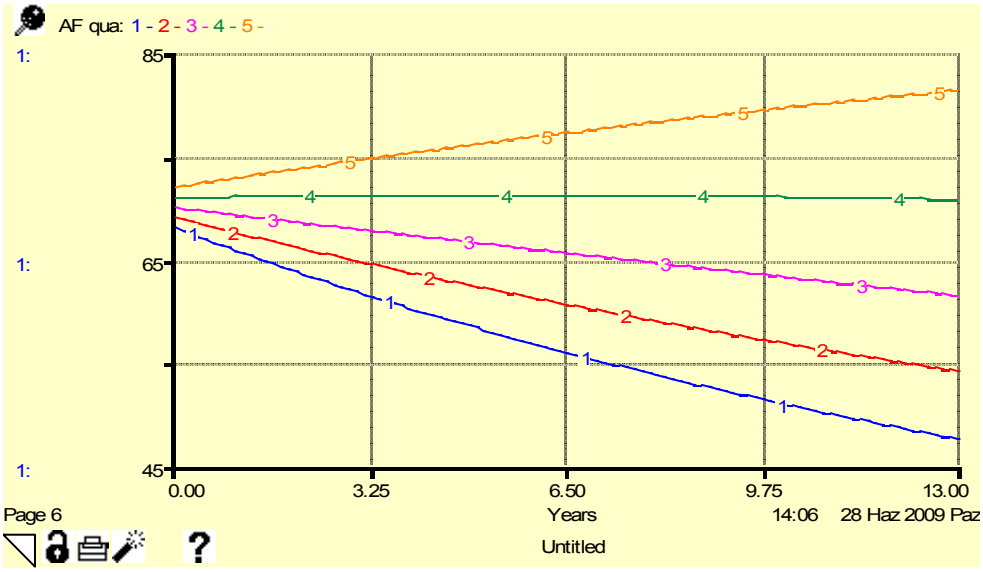


Figure 102 Sensitivity Run for AF qua with PA Policy

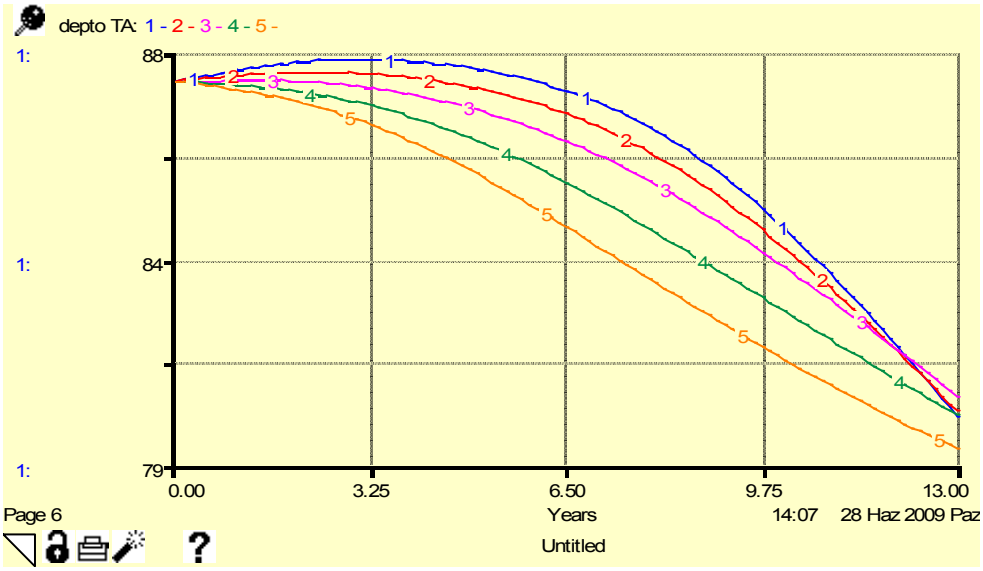


Figure 103 Sensitivity Run for depto TA with PA Policy

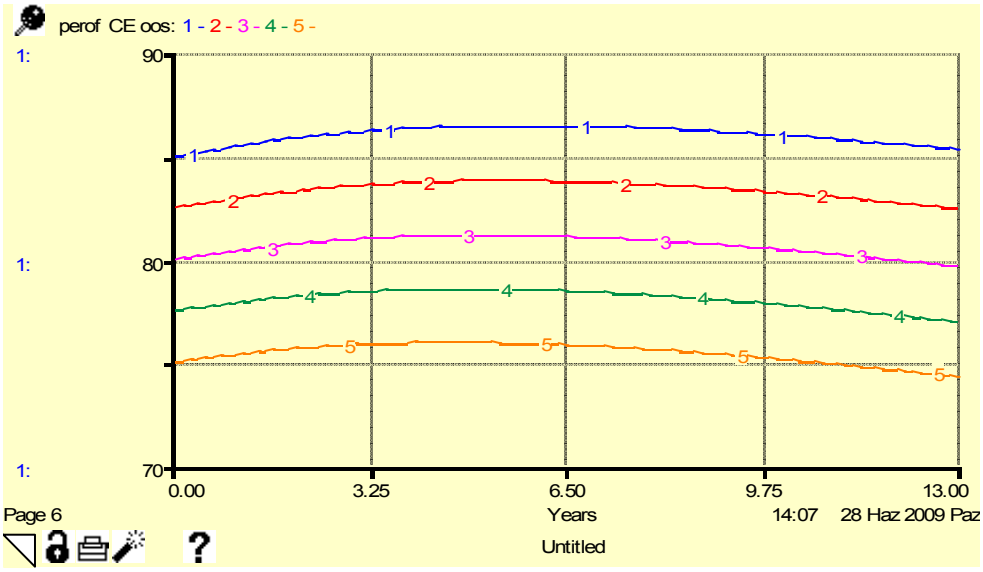


Figure 104 Sensitivity Run for perof CE oos with PA Policy

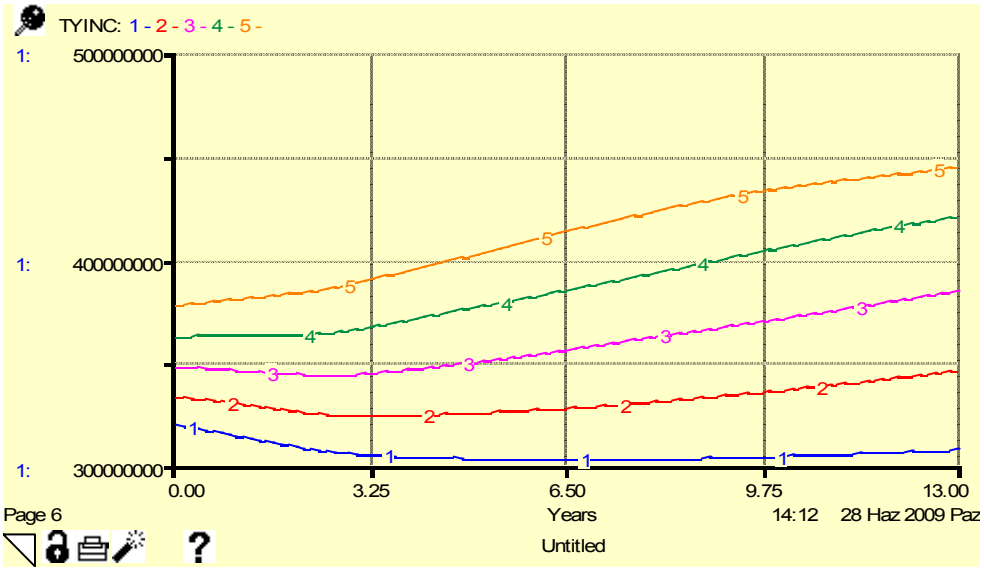


Figure 105 Sensitivity Run for TYINC with AIST Policy

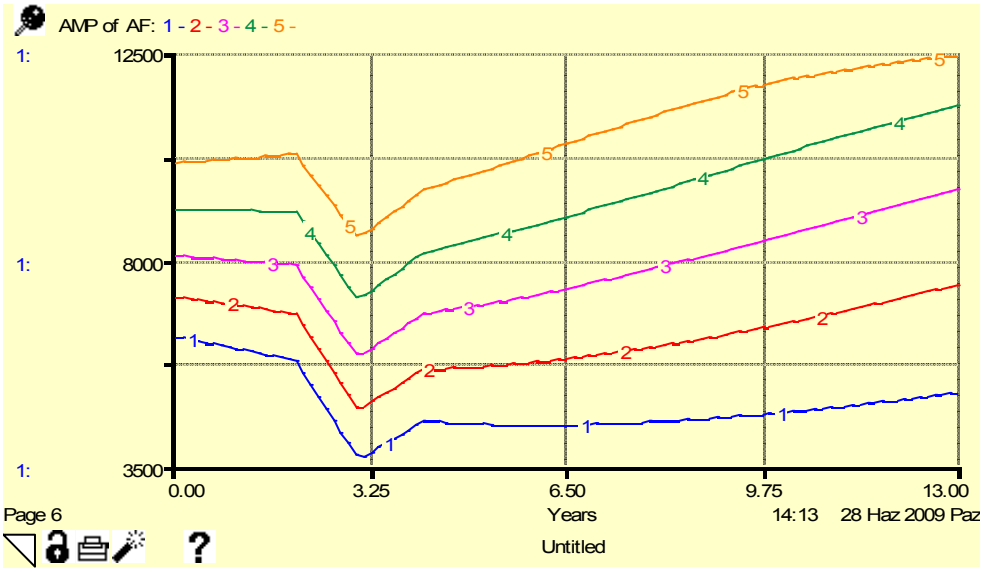


Figure 106 Sensitivity Run for AMP of AF with AIST Policy

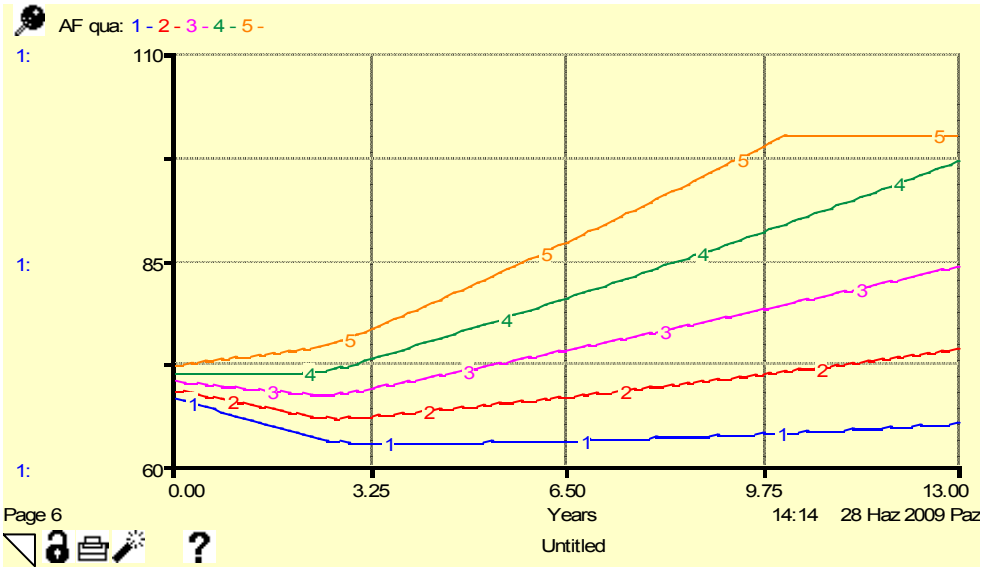


Figure 107 Sensitivity Run for AF qua with AIST Policy

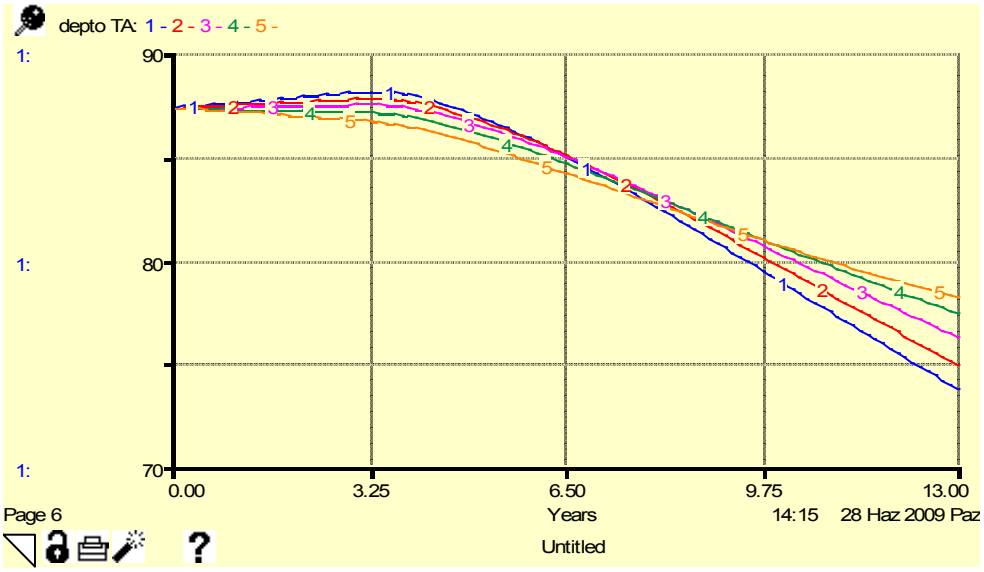


Figure 108 Sensitivity Run for depto TA with AIST Policy

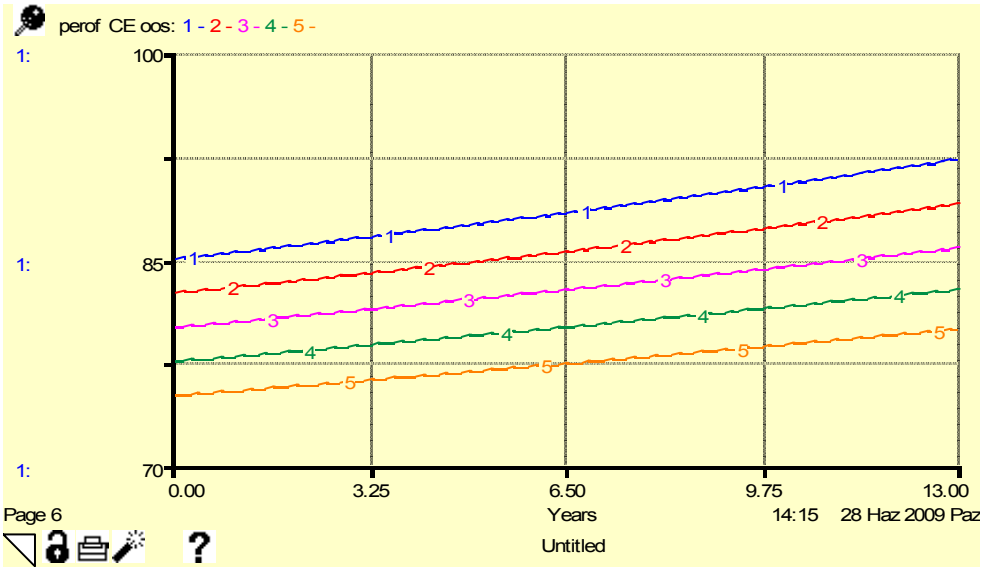


Figure 109 Sensitivity Run for perof CE oos with AIST Policy

2. Changing Effect Formulations (Case of NAC alternative)

MEOF_AF_qua_on_nof_int_TAI = GRAPH(AF_qua/N_AF_qua)
(0.5, 0.85), (0.583, 0.852), (0.667, 0.859), (0.75, 0.873), (0.833, 0.9), (0.917, 0.949), (1.00, 1.00), (1.08, 1.04), (1.17, 1.07), (1.25, 1.08), (1.33, 1.09), (1.42, 1.09), (1.50, 1.10)

MEOF_AF_qua_on_AP_deby_AF = GRAPH(AF_qua/N_AF_qua)
(0.5, 0.8), (0.6, 0.817), (0.7, 0.848), (0.8, 0.893), (0.9, 0.95), (1, 1.00), (1.10, 1.03), (1.20, 1.05), (1.30, 1.08), (1.40, 1.09), (1.50, 1.10)

IR_MEOF_NAC_on_PR_of_TA_fr_AO = GRAPH(NAC)
(0.00, 1.00), (0.1, 1.00), (0.2, 1.01), (0.3, 1.01), (0.4, 1.02), (0.5, 1.03), (0.6, 1.04), (0.7, 1.05), (0.8, 1.06), (0.9, 1.08), (1, 1.09), (1.10, 1.11), (1.20, 1.13), (1.30, 1.16), (1.40, 1.18), (1.50, 1.21)

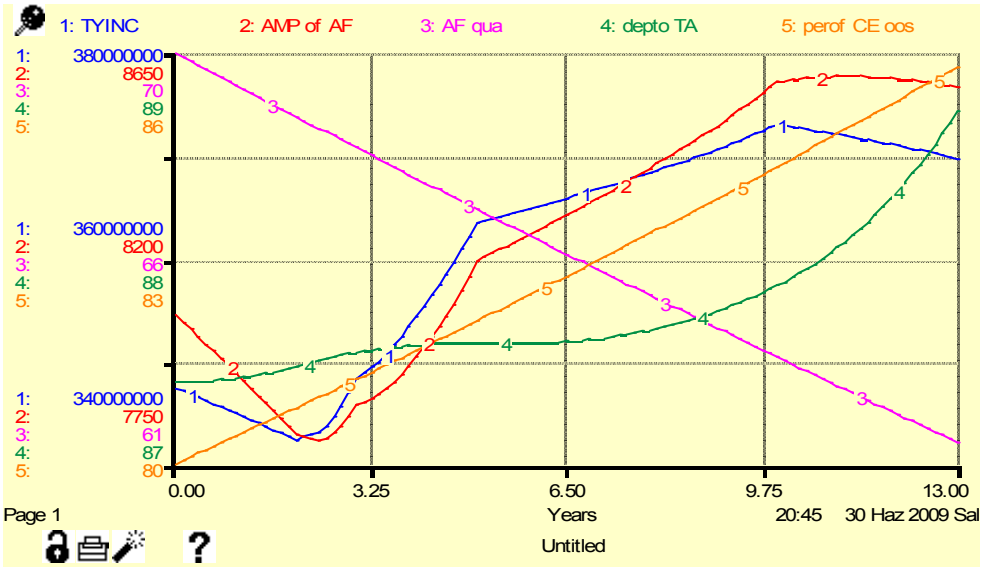


Figure 110 Sensitivity Run By Changing Effect Formulations - 1

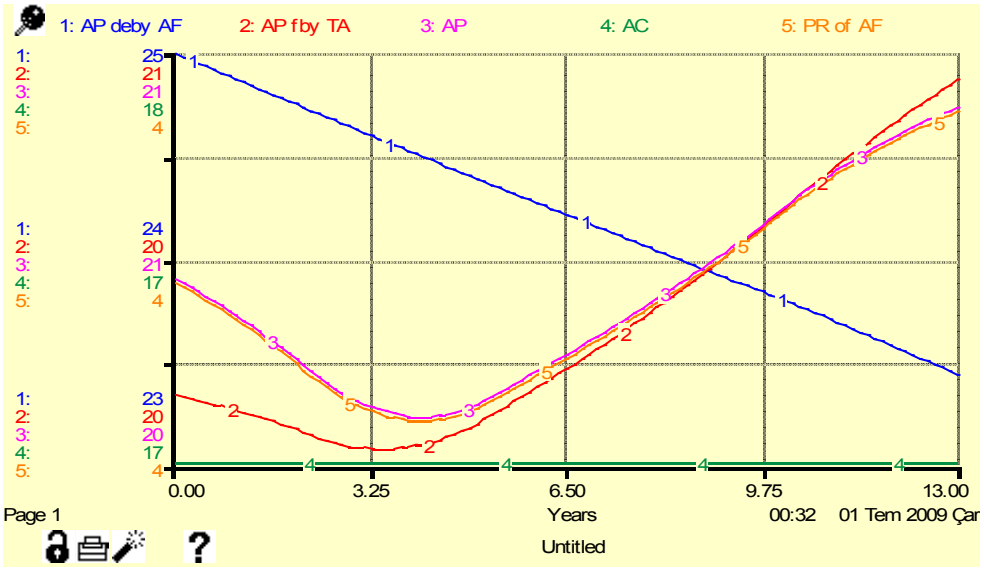


Figure 111 Sensitivity Run By Changing Effect Formulations - 2

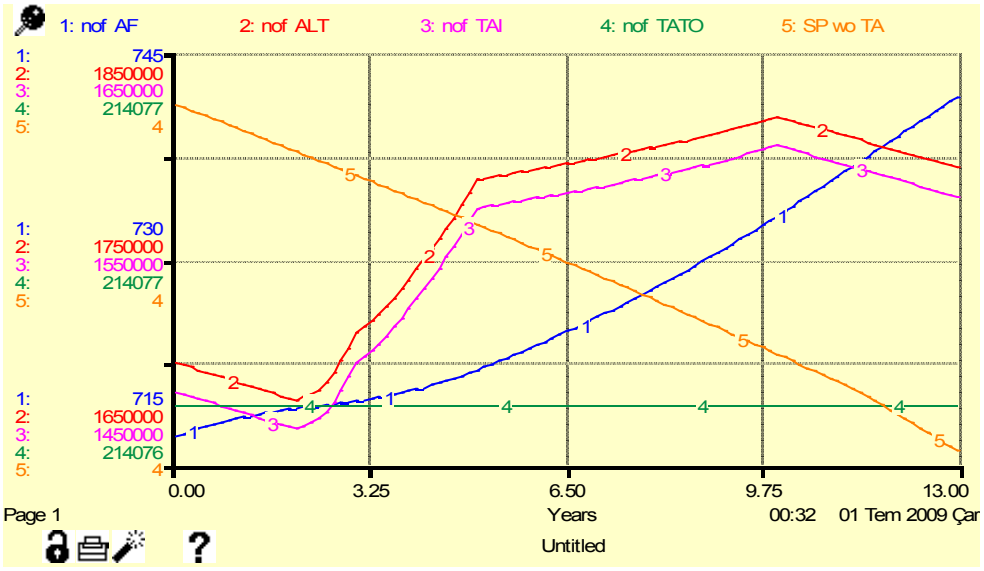


Figure 112 Sensitivity Run By Changing Effect Formulations - 3

3. Changing boundary

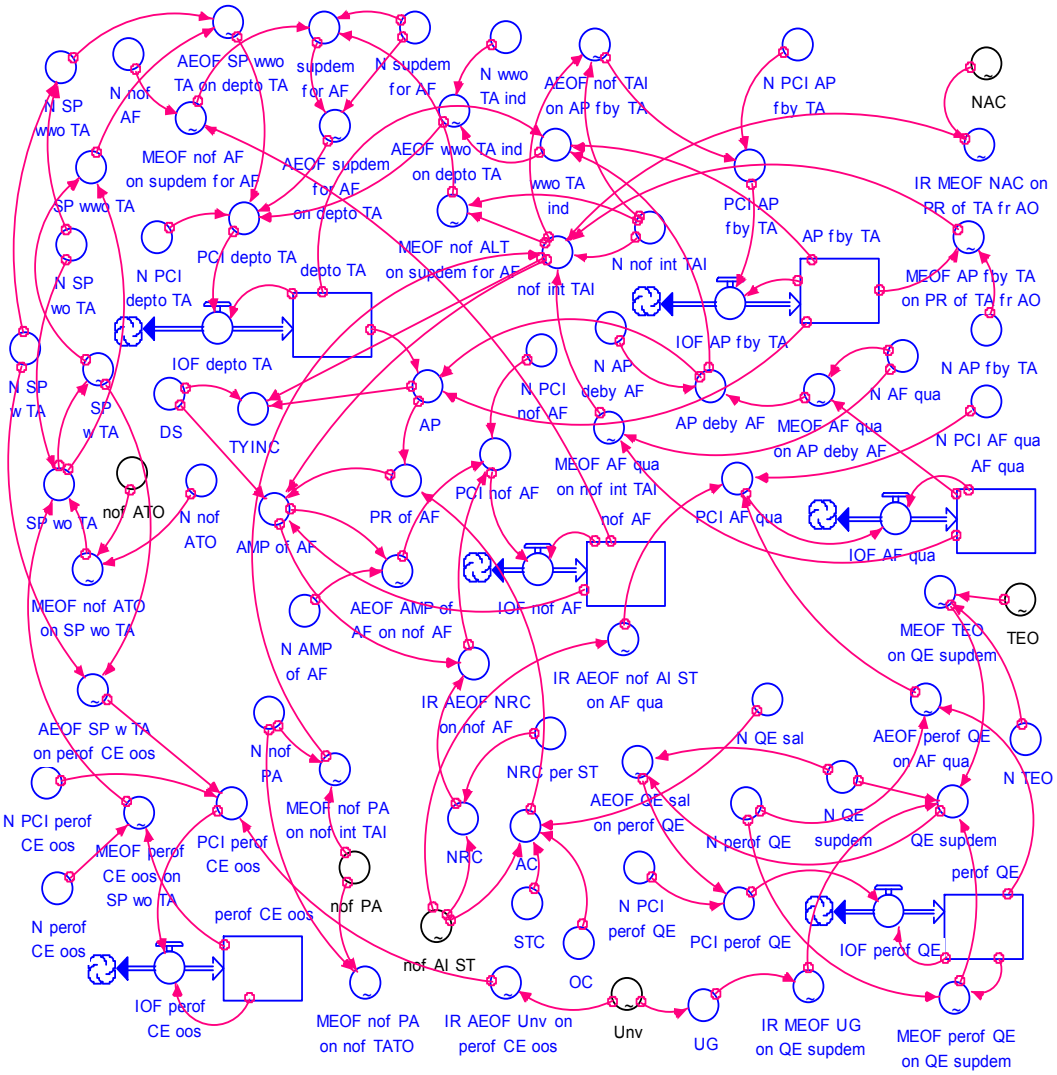


Figure 113 Modified Model Boundary for Alanya Tourism Sector

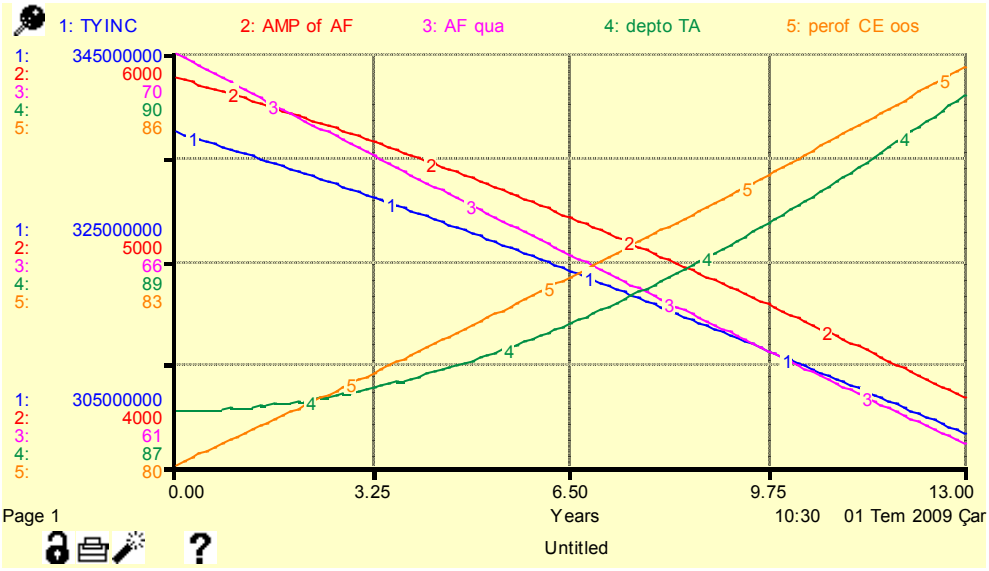


Figure 114 Sensitivity Run with Modified Model Boundary – No Action Policy - 1

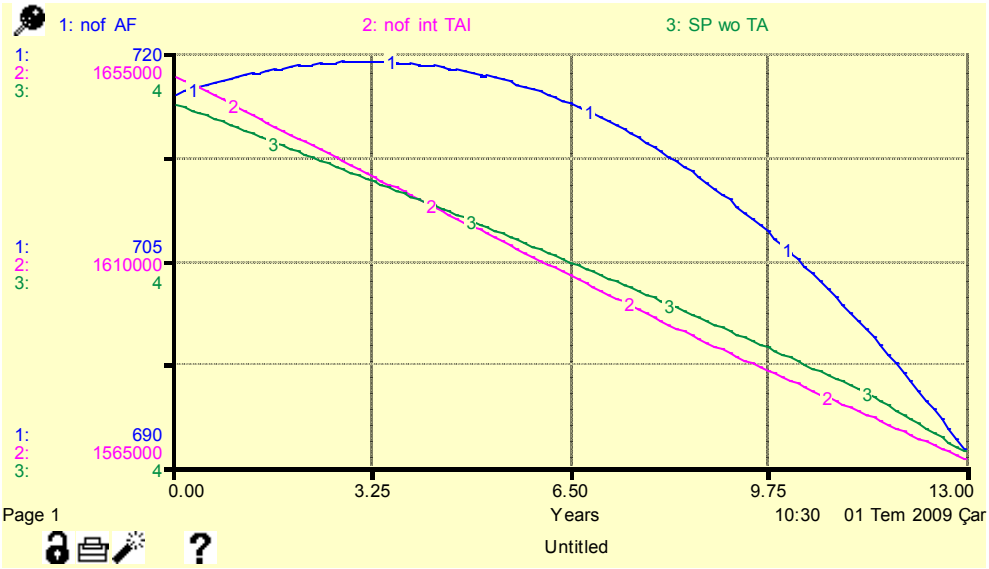


Figure 115 Sensitivity Run with Modified Model Boundary – No Action Policy - 2

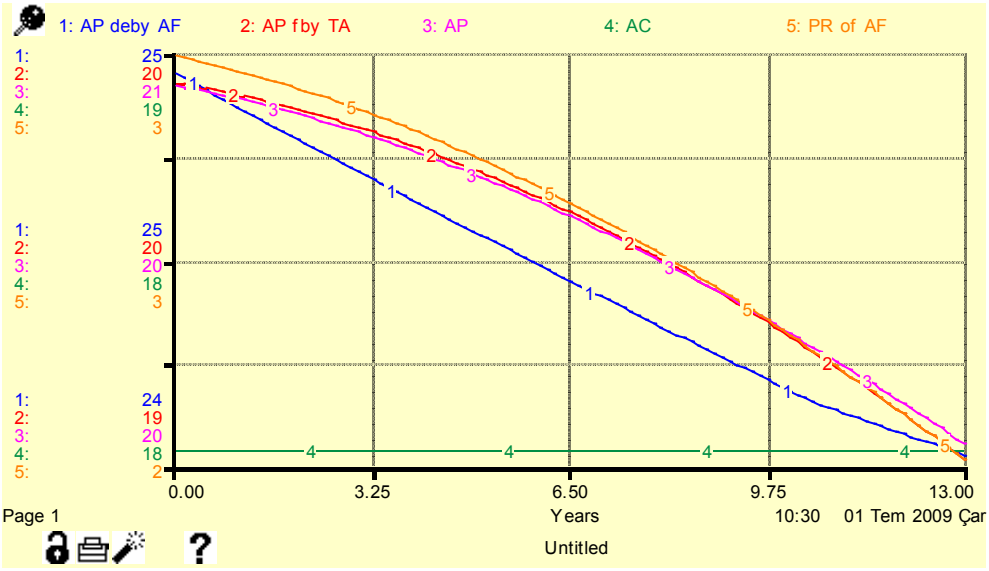


Figure 116 Sensitivity Run with Modified Model Boundary – No Action Policy - 3

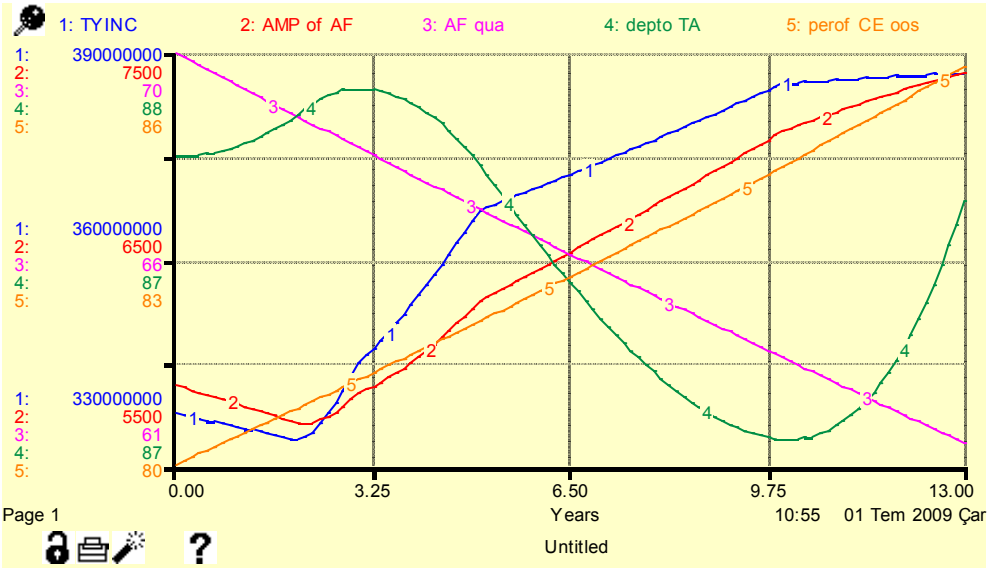


Figure 117 Sensitivity Run with Modified Model Boundary – NAC Policy - 1

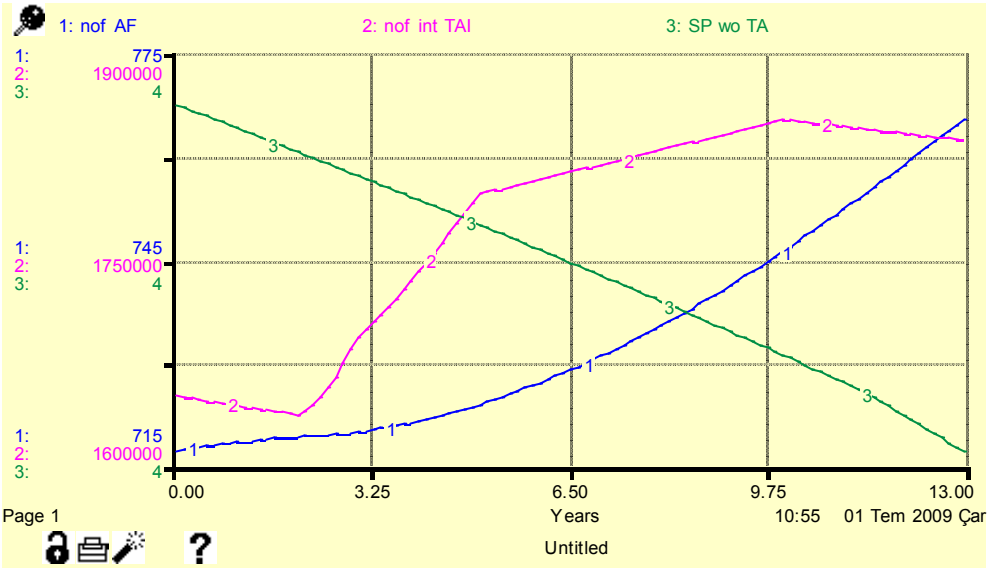


Figure 118 Sensitivity Run with Modified Model Boundary – NAC Policy - 2

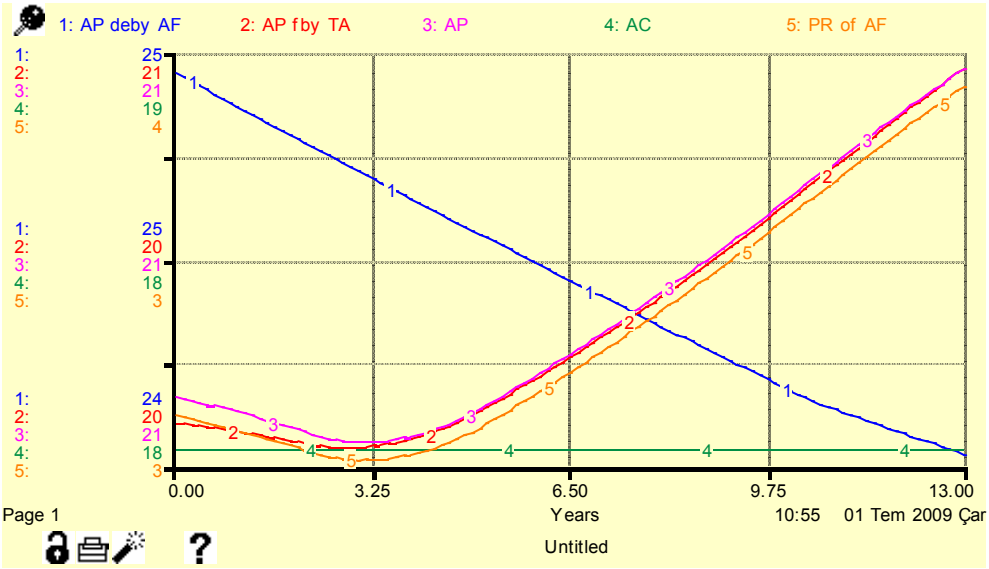


Figure 119 Sensitivity Run with Modified Model Boundary – NAC Policy - 3

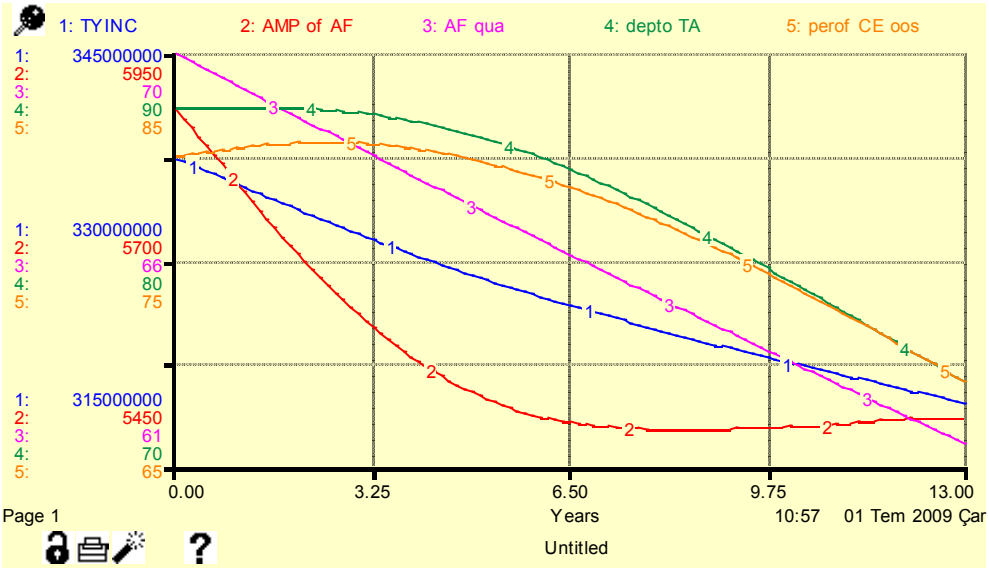


Figure 120 Sensitivity Run with Modified Model Boundary – ATO Policy - 1

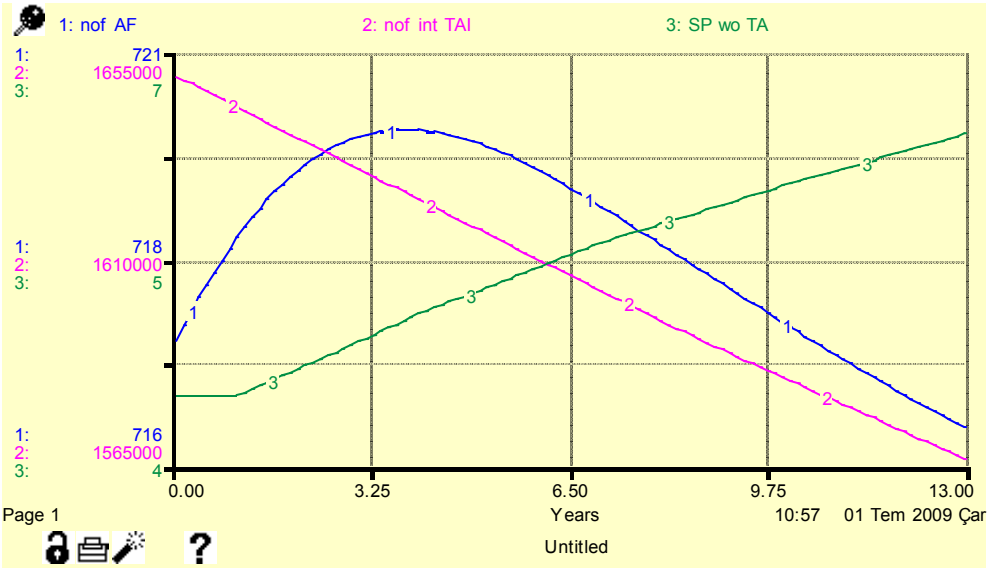


Figure 121 Sensitivity Run with Modified Model Boundary – ATO Policy - 2

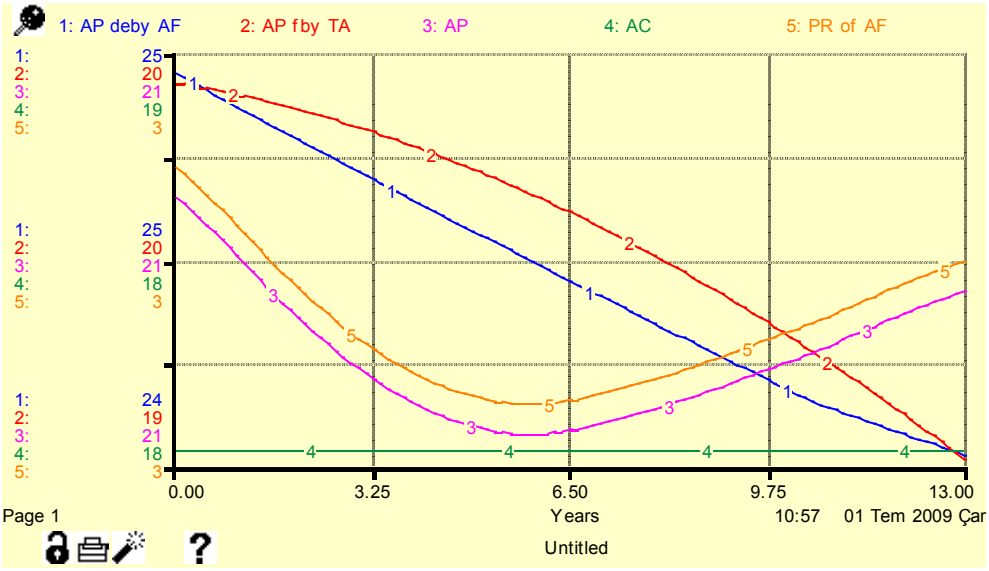


Figure 122 Sensitivity Run with Modified Model Boundary – ATO Policy - 3

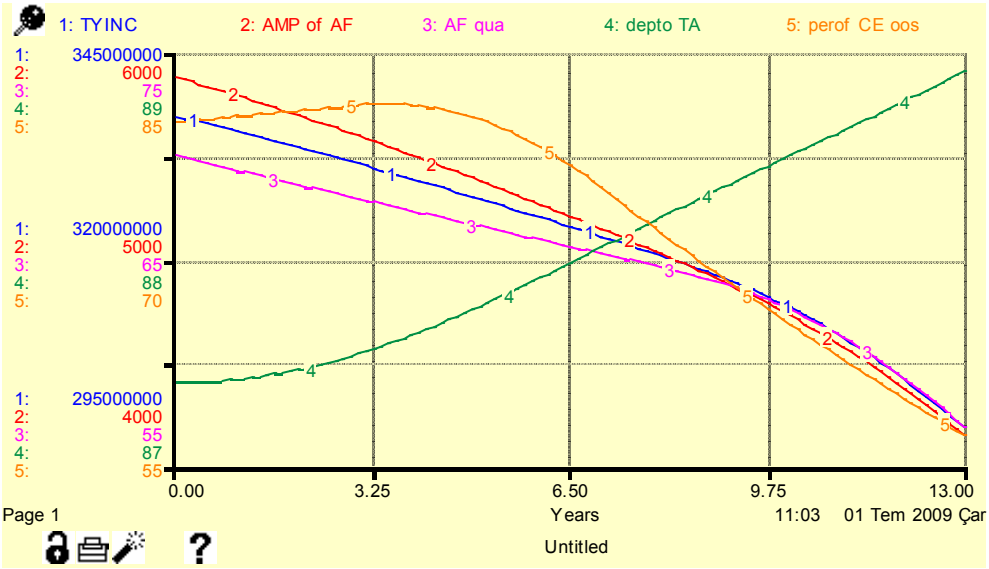


Figure 123 Sensitivity Run with Modified Model Boundary – Univ Policy - 1

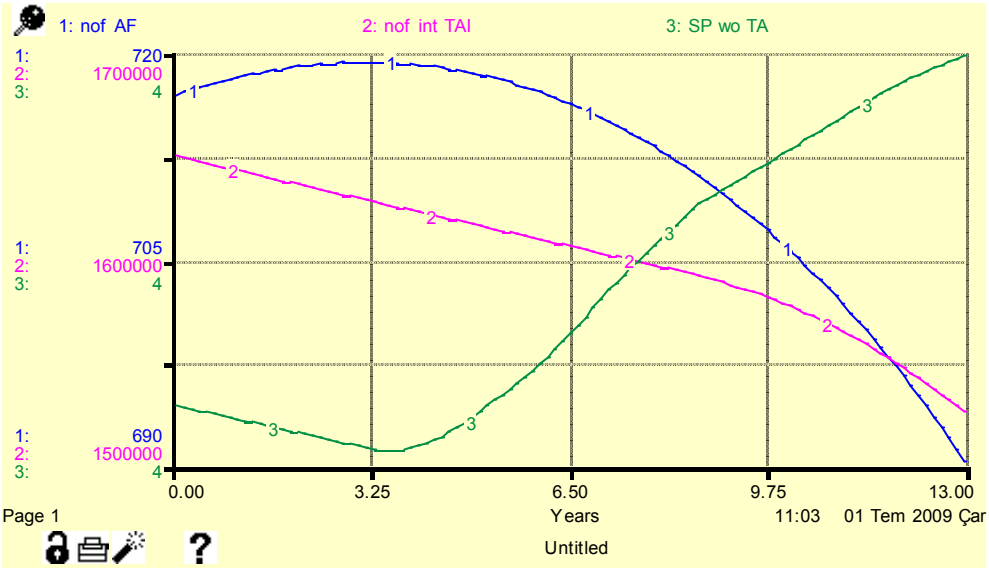


Figure 124 Sensitivity Run with Modified Model Boundary – Univ Policy – 2

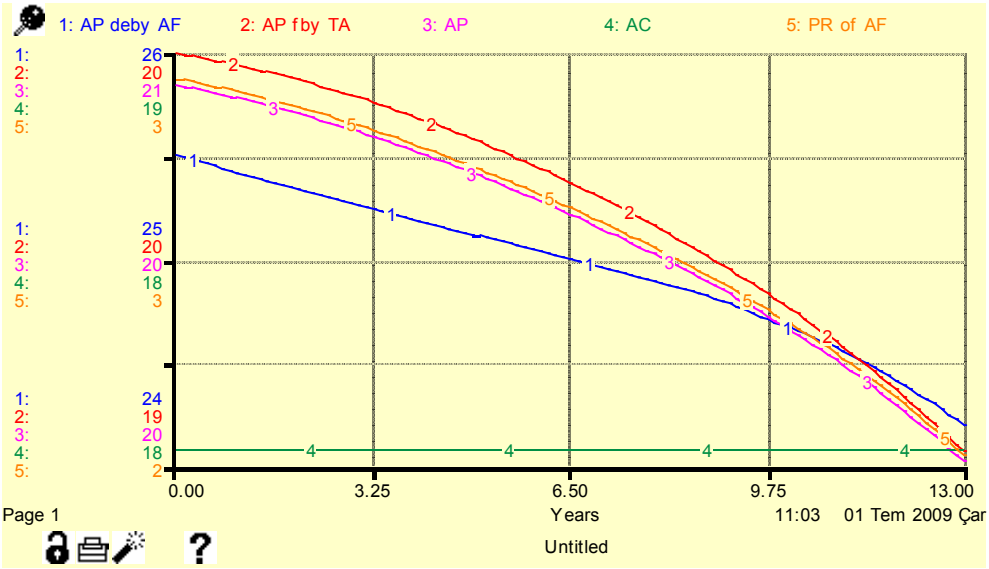


Figure 125 Sensitivity Run with Modified Model Boundary – Univ Policy - 3

TEO:

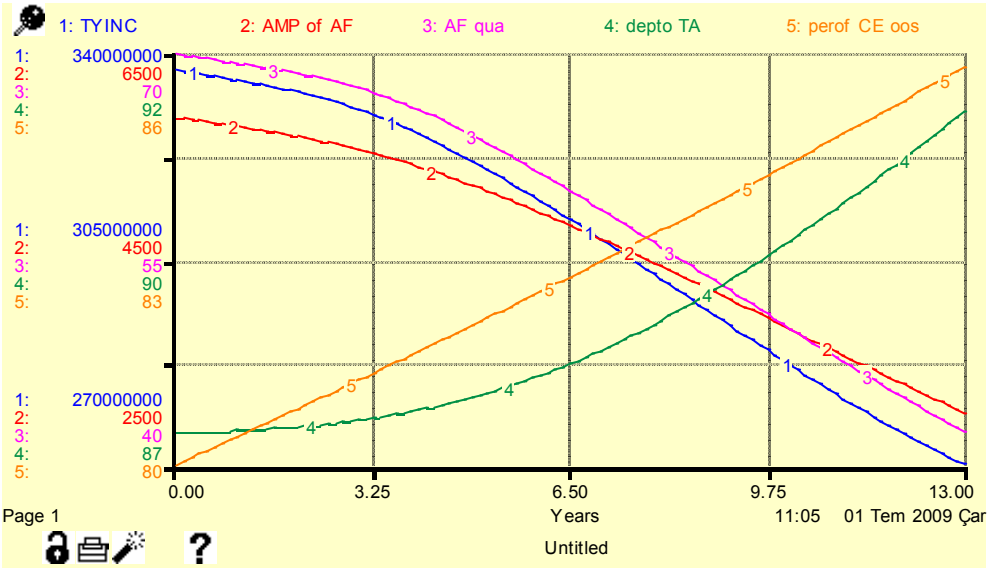


Figure 126 Sensitivity Run with Modified Model Boundary – TEO Policy – 1

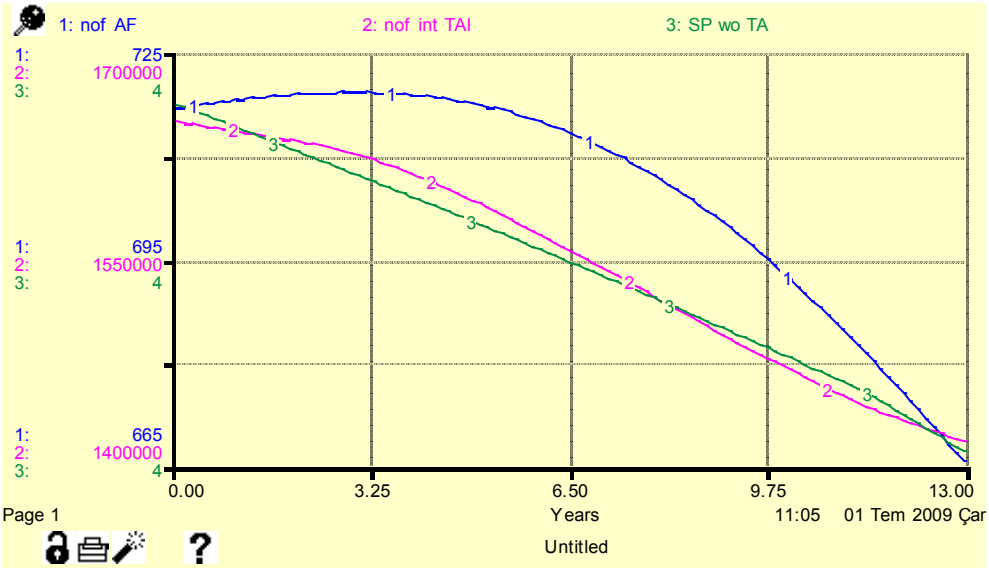


Figure 127 Sensitivity Run with Modified Model Boundary – TEO Policy - 2

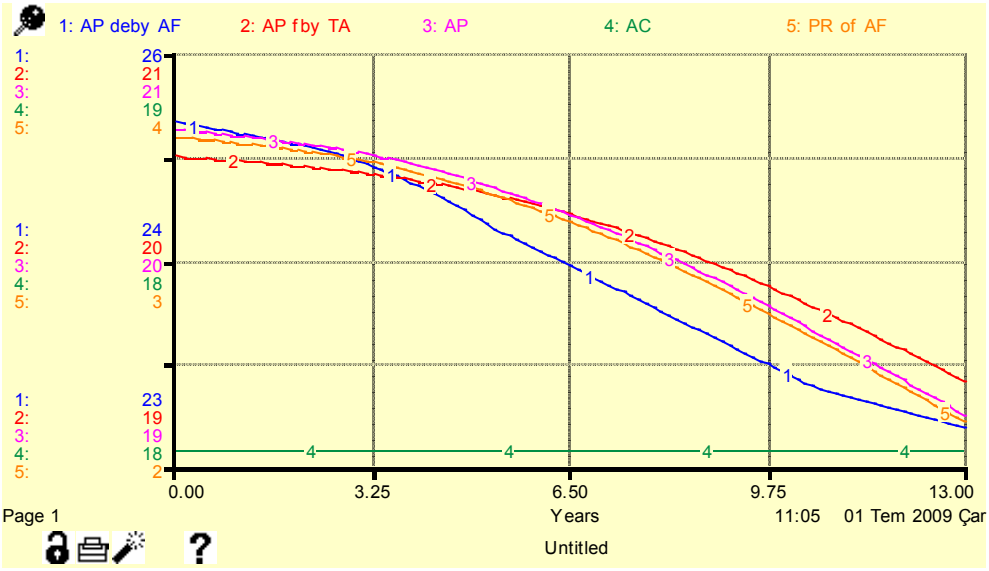


Figure 128 Sensitivity Run with Modified Model Boundary – TEO Policy - 3

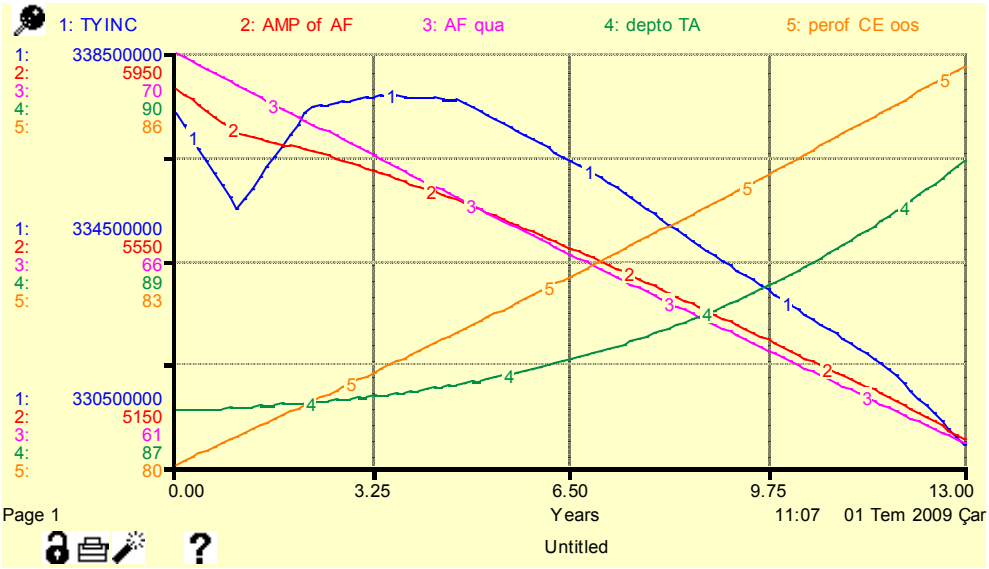


Figure 129 Sensitivity Run with Modified Model Boundary – PA Policy - 1

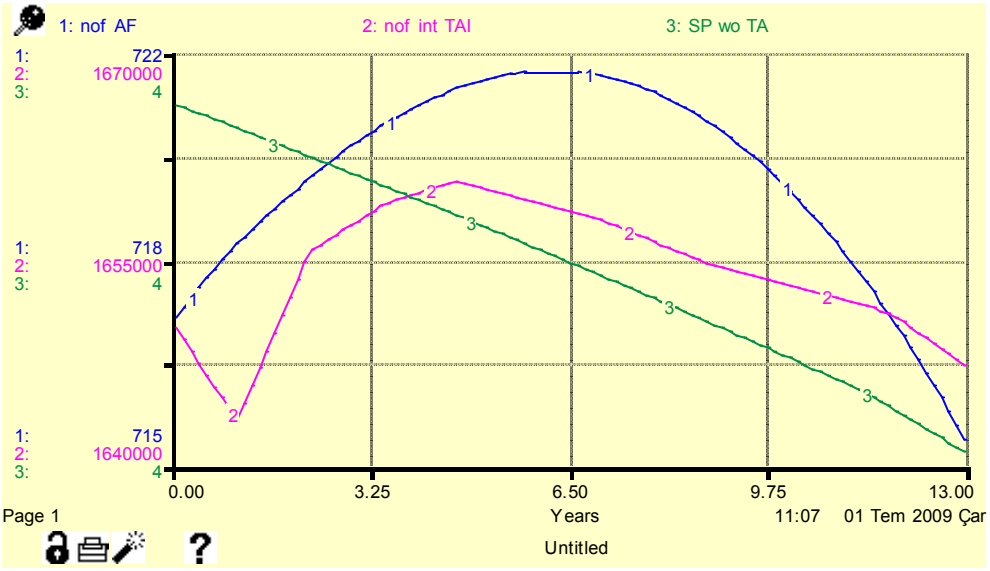


Figure 130 Sensitivity Run with Modified Model Boundary – PA Policy - 2

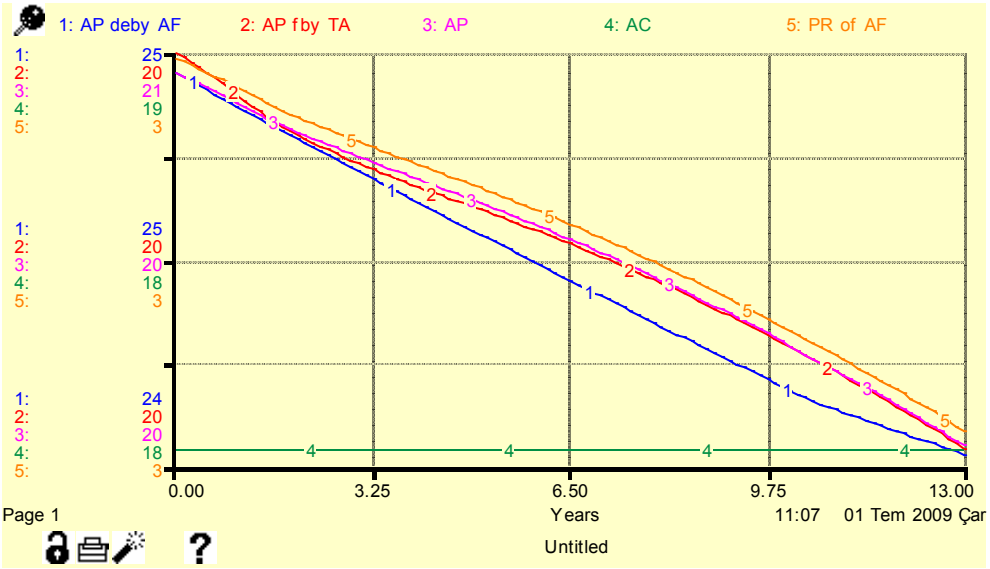


Figure 131 Sensitivity Run with Modified Model Boundary – PA Policy - 3

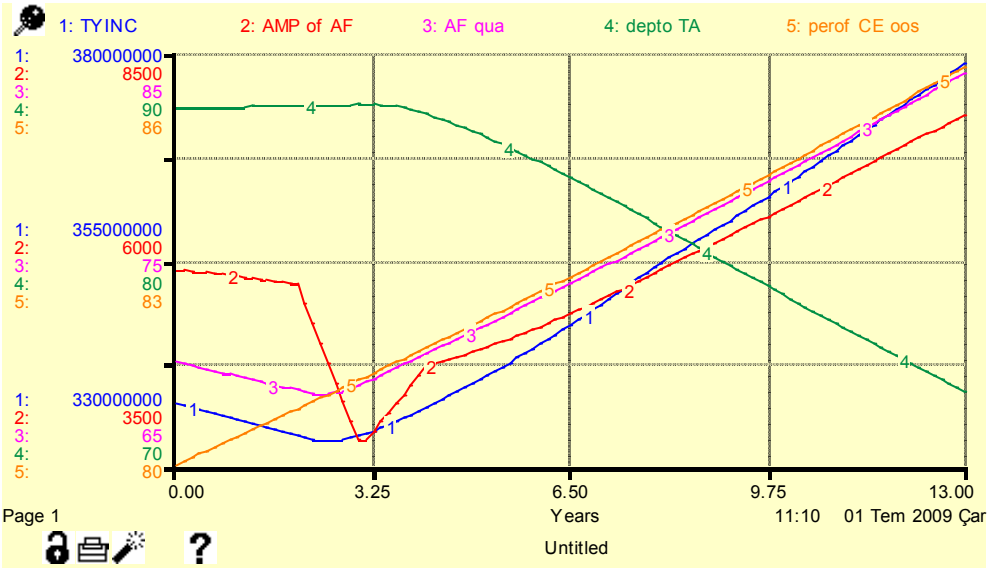


Figure 132 Sensitivity Run with Modified Model Boundary – AIST Policy - 1

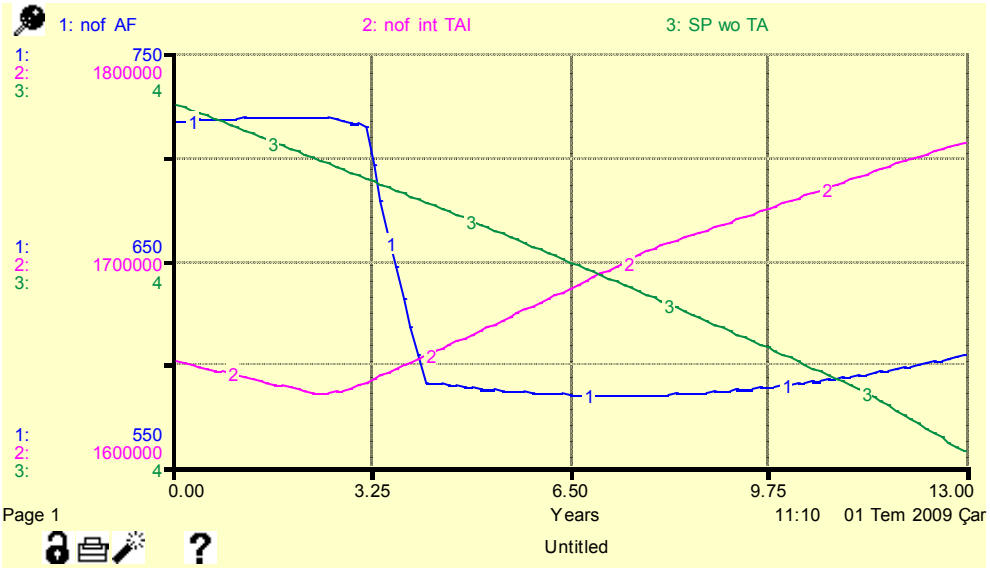


Figure 133 Sensitivity Run with Modified Model Boundary – AIST Policy - 2

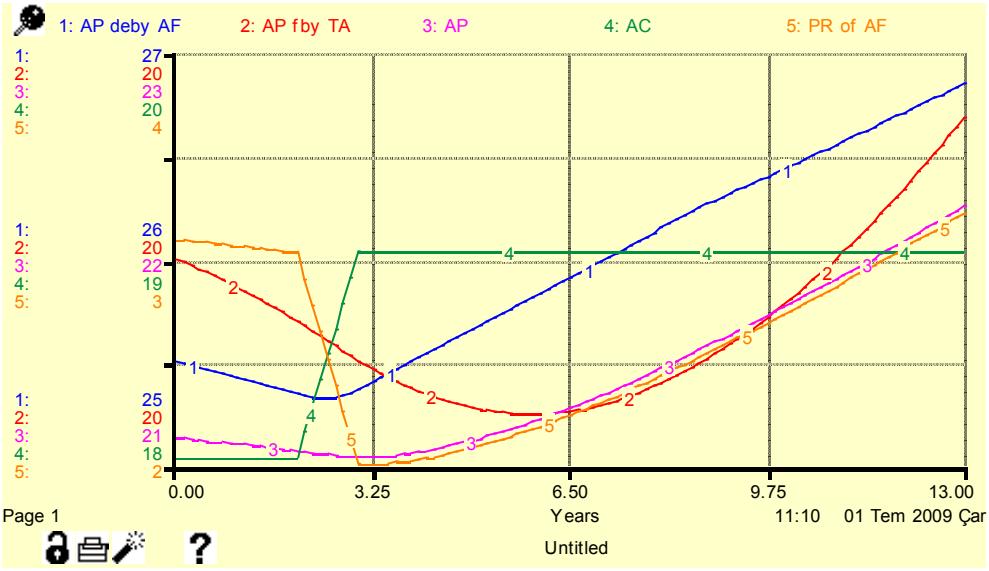


Figure 134 Sensitivity Run with Modified Model Boundary – AIST Policy - 3