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Como a estrutura do tecido empresarial português afecta a
sustentabilidade da Segurança Social?

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Resumo

Os Sistemas de Segurança Social têm sido objeto de estudo, nomeadamente quanto à sua sustentabilidade, levando em consideração o impacto que alguns fenómenos recentes, tais como o envelhecimento da população, a globalização, as crises económica e financeira, entre outros, têm provocado.

A presente dissertação tem como objetivo analisar como o Sistema de Segurança Social Português é influenciado pelas empresas, de acordo com a sua dimensão por número de empregados, entre 1990 e 2012. Na verdade e como irá ser visto, as empresas e o Sistema de Segurança Social estão relacionados: medidas adotadas pelas empresas influenciam o Sistema de Segurança Social e vice-versa.

Para o efeito, utiliza-se um modelo empírico, relacionando as contribuições do Sistema de Segurança Social Português, concretamente as receitas que a Segurança Social obtém da tributação aplicada aos salários dos empregados, com o total de remunerações nas empresas, considerando a sua diferente dimensão, durante o período em estudo.

Concluindo, a presente tese pretende ser um potencial começo na investigação desta questão específica: *como a estrutura do tecido empresarial português afeta a sustentabilidade da Segurança Social?*, esperando dar respostas, mas também estimulando o aparecimento de novas perguntas que levem investigadores a prosseguir e a aprofundar esta análise. Mais que uma dissertação de tese, este estudo representa uma obrigação social, no sentido de contribuir para o bem-estar da sociedade.

Palavras-Chave:

Sistema de Segurança Social Português, Coesão Social, Receitas Correntes, Contribuições, Empresas, Micro Empresas, PME's, Grandes Empresas, Remunerações.

Códigos JEL:

C10, C22, D69 e L29.

Abstract

The Social Security Systems have been object of study, namely about their sustainability, in order to response to new questions that some phenomenon, such as ageing population, globalization, economic and financial crisis, between others, have brought to the societies.

The present dissertation aims to analyze how Portuguese Social Security System is influenced by the companies, according to their dimension by number of employees, between 1990 and 2012. In fact and as it will be seen, companies and Social Security System are related: decisions in companies influence Social Security System and vice-verse.

For the effect, it is used an empirical model, relating the contributions of Portuguese Social Security System, receipts that Social Security System obtains taxing the wages of employees, with the total of remunerations in companies, characterized by dimension, along the period in study.

Concluding, this thesis intends to be a potential start to investigate this specific question *how the structure of the Portuguese firms affects the sustainability of Social Security?*, expecting to give some answers, but also to stimulate new questions so that others will proceed this study in the future. More than a dissertation thesis, this works represents a social obligation in order to be useful to the welfare of society.

Word-Keys:

Portuguese Social Security System, Social Cohesion, Current Receipts, Contributions, Companies, Micro Companies, SME's, Big Companies, Remunerations.

JEL codes:

C10, C22, D69 e L29.

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Glossary of Acronyms

SME's	Small and Medium Enterprises
PAYG	Pay-As-You-Go
EEC	European Economic Community
GDP	Gross Domestic Product
SEF	Social European Fund
EPAOG	European Fund for Agricultural Orientation and Guaranty
EFRD	European Fund to Regional Development
EFFO	European Found for Fishing Orientation
EU	European Union
IMF	International Monetary Fund
R&D	Research & Development

Introduction

During last decades, in most developed countries, Social Security Systems have been debated, with special incidence on their potential unsustainability problems. Their importance for the economies is undeniable, being an instrument that societies use to promote social cohesion, workers protection, support to the older, as well as to the unemployed people, to the women and to people with specific needs (like disabled people for example).¹ It also guarantees people's welfare, through health care assistance.

Despite their importance, Social Security Systems have not been immune to many changes that occurred in developed countries, namely ageing of populations, which has been pointed as one of the phenomenon that most affects their sustainability. In fact, the rapid growth of old people in relation to the younger² has led to the adoption of measures in many countries such as the increase of the retirement age, the rise of taxes on wages, the alteration of pensions calculi formula, an increase in efficiency in recuperation of debts to Social Security Systems, a reduction of benefits for beneficiaries (reduction, for example, of transferences for the families that have children, widowhood's pensions, of national minimum wage, of the eligible time to have a pension for unemployment).

However, opinions about potential problems of unsustainability in Social Security Systems have not always been consensual. Studies that have been made in the last decade show that specialists believe that, besides ageing, other factors may deteriorate (or improve) the financial situation of Social Security Systems. These are labor productivity, Social Security Systems maturity, the diversification of receipts sources, the investments in which the stocks of capital are allocated, between other.

Firms (or companies)³ play an important role in Social Security Systems. In contributive Social Security schemes, firms have high responsibilities, especially in deduction and payment of contributions, being legally regulated how it must occur. Companies and Social Security Systems must work as social partners, prosecuting measures that promote social cohesion, employees' welfare, pensions in case of maternity, disease or unemployment, for

¹ According to Wilkinson (1996), Social Security Systems have an important role in wealth distribution. He defends that the richest countries are not necessarily the healthiest ones. In his work "Unhealthy Societies: The Afflictions of Inequality", he says that the healthiest countries are the ones where wealth is distributed in a fair way and the levels of social integration are high.

² Some authors (for example, Giddens) use the expressions "old old" and "old young", in order to distinguish old people with more than 85 years from old people with more than 61 years.

³ Both words can be used ("companies" or "firms"). According to the "Dictionary of Economics" (1998), mentioned in bibliography, "companies" is the most correct.

example. Companies' contributions represent an important source of receipts for Social Security System. In this aspect the relation between the structure of companies and the sustainability of Social Security Systems becomes evident. If companies employ more people or increase wages, for instance, the value of contributions will grow. But, in opposite, if companies are firing people, reducing wages or simply shutting down, they will decrease their contributions to the Social Security System. Some other aspects also have influence, especially the productivity. In fact, it is believed that a positive correlation exists between productivity and Social Security System: productivity helps companies to become effectively more competitive, allowing achieving their goals in global market. In fact, workers that feel protection (for example, through healthcare assistance) tend to be more productive (Committee on Social Security, 2001).

During last thirty years, Portugal has passed through many changes, such as the Revolution of 25th of April, the adhesion to CEE, the adoption of the Euro, until IMF's recent intervention, to name a few. During that period, the Portuguese Social Security System incorporated some changes too, especially as a consequence of new laws introduced with the April's Revolution. Also firms evolved, influenced by and influencing the events. Firms in Portugal, in its great majority, employ a small number of employees. Their cost structure is considered heavy, especially regarding their responsibilities with their employees in which, besides wages, social security contributions represent the largest slice. Recently, after the IMF's intervention, a discussion has been opened regarding the most appropriate form of firms' contributions to Portuguese Social Security System, trying to understand if changing the system could alleviate the burden over medium and small size firms. With this thesis, we aim to investigate how the structure of the Portuguese firms affects the sustainability of Social Security, namely how the predominance of small size firms may help to explain the evolution of Social Security System contributions. We intend to understand, for the period in study, how Portuguese Social Security System and firms influenced each other.

We choose to follow long-run perspective, focusing on time series to capture the relation between companies and Social Security System in Portugal. The classification criterion of companies is their dimension, according to their number of employees.

Many other studies were published (mentioned in bibliography). The present thesis aims to give a small contribute, exploring the importance of Portuguese companies in Portuguese Social Security System and stimulating others to continue the study from this present work.

This work is organized as follows: chapter I is a brief literature review; chapter II discusses the Social Security System (its importance, brief story of Portuguese Social Security System, its numbers); chapter III is about companies (their role in economy, their evolution in Portugal, their numbers); chapter IV presents an econometric study, which will support the answer to the research question; conclusion presents the main conclusions of the study.

Chapter I

1. Literature Review

Social Security System has been the subject of many authors attention. Galasso and Profeta (2000), wrote that most developed countries have Pay-As-You-Go (PAYG) system⁴. The common thread in this type of studies is to understand why there are social security schemes that transfer resources from young and middle-aged to old. Within this analysis, it is noted that there are two models: models run by interest groups and models subject to a vote. Voting models can be classified according to the factors that lead young people and middle-age to vote in favor of the growth of social security systems. Five major economic reasons for this are identified: dynamic inefficiency (Aaron, 1966), reduced time horizon to evaluate program effectiveness (Browning, 1975), the crowding out of aggregate savings to the social security system (Tabellini, 2000), shared Redistribution (Tabellini, 2000), altruistic motives (Hanson and Stuart, 1989). This study concluded that the measures that must be taken to maintain the Portuguese Social Security System working are: changing from a PAYG to a mixed system, changing the retirement age and reformulation of the pension calculi formula. As it will be seen in chapter II, changing the retirement age and the pension calculi formula are two measures that Portugal adopted in the past.

Pereira and Rodrigues (2001) discussed the public pension system in Portugal in 1998. At the time, the public pension system was based on three assumptions: private and public sectors had different financing system, people were beginning to contribute to private pensions managed by insurance companies and by authorized funding systems and both public sector and private sector were governed by the PAYG pension system financed through employer and employee. Assuming the assumptions outlined above, this study

⁴ There are two major systems of social security: fully-funded and pay-as-you-go. In the fully-funded system, contributions of each generation are invested in securities. The benefits of each generation are the returns on their investments in securities. The system holds a stock of capital. The pay-as-you-go system does not hold a stock of capital. The benefits of each generation are contributions paid by the future generation. The sustainability of the system depends on the number of people who contribute on the number of people that benefit.

examined the impact that population ageing would have on the evolution of social pensions in the next 50 years, if no reform was adopted, and concluded that only maintaining productivity growth would not be enough. The authors emphasize that it is needed to keep productivity growth above the average growth of pensions and employment growth above the growth of pensioners.

The Committee on Social Security, 2001, arrived to many conclusions, mentioning the role of companies as a social partner. Between many others, an extremely important conclusion was that it is in more open economies that occur higher social spending and that globalization does not lead to the reduction of these expenses. Indeed, more open economies are more exposed to external risks and, as such, tend to require higher structural adjustments, using the enhancing of social support.

Doepke (2007) explains in general terms the structure of a social security system fully-funded and pay-as-you-go. The Fully-Funded corresponds to a system in which the contributions of each generation are invested, for example, titles and benefits of each generation correspond to the returns of the investment. Simultaneously, the Social Security System holds a stock of capital. In Pay-As-You-Go system, the system does not hold a stock of capital and the benefits of each generation correspond to the contributions paid by the future generation. Thus, the sustainability of the latter is determined by the number of people contributing on the number of people benefiting. Rodrigues e Marvão (2007) describe the Portuguese social security system since 1886, the reforms carried out and the ones that are urgent to be adopted. In general terms the action proposed to prevent the bankruptcy of social security go through the following measures: i) adjusting the sustainability factor; ii) changing the pensions' calculi formula; iii) ceilings for higher pensions; iv) changing the rules for annual pension increases; v) promoting active ageing; vi) changing the funding ways; vii) reorienting social protection; viii) stimulating savings and increase birth; ix) greater involvement of the social partners.

Pereira and Andraz (2009) developed an empirical study about the macroeconomic effects of the social security Pay-As-You-Go system in Portugal in the period 1970-2007, based on GDP, the cost of labor, the unemployment rate, the savings rate and expenditure of social security. The growth of social security spending had had negative effects on all variables in the private sector, which suggests that there were considerable inefficiencies. Second, these inefficiencies were still persisting, despite successive reforms that had been adopted over the two decades before. These results brought to the top the need for structural reforms in the

pay-as-you-go system. The findings of this study suggested firstly, that the increase in social security spending has negative effects in labor market and in the financial market. In fact, this increase in spending produces an increase in unit labor costs. Also the increase in unemployment generates a reduction in the savings rate. Secondly, the results suggest that the reforms adopted in the two decades before had not been effective in dealing with the inefficiencies of the social security system. The negative effects of social security spending in GDP remained relatively the same as the ones that existed before the reforms, with deterioration in the savings rate and unemployment. After this work, two challenges were put up: separate the information from the contributory system of the non-contributory system (although both have inefficiencies, its origins are quite different) and a structural analysis should be developed (taking into account demographic factors vs the maturity of the system and the magnitude of the distortions identified).

Chapter II

2. Social Security System

2.1. The role of Social Security System

In a few words, Social Security can be described as a system that pretends to guarantee citizens' basic rights and the equality of opportunities, at the same time that promotes the welfare and the social cohesion for all citizens (Portuguese or not) that work in the country. The fundamentals of the Portuguese Social Security System are defined in the law n° 4/2007, 16th of January.

In order to prosecute its goals, the system is based in the following principles⁵:

- Universality: consists of access for all persons to social protection provided by the system, as defined by law;
- Equality: consists of the nondiscrimination of beneficiaries, including those based on sex and nationality, without prejudice, on this, the conditions of residence and reciprocity;
- Solidarity: is the collective responsibility of the people to each other in carrying out the purposes of the system and involves the state contest in its funding;
- Social equity: consists of equal treatment of equal situations and differentiated treatment of different situations;

⁵ According to www4.seg-social.pt

- Positive differentiation: is the flexibility and modulation of benefits based on income, social contingencies and other factors, including family, social, labor and demographic nature;
- Subsidiarity: based on the recognition of the essential role of individuals, families and other non-public institution in pursuit of the objectives of social security, particularly in the development of social action;
- Social insertion: characterized by active, preventive and personalized nature of the actions carried out under the system in order to eliminate the causes of marginalization and social exclusion and promote human dignity;
- Intergenerational cohesion: implies an adjusted balance and generational equity in the accountability of the system;
- Primacy of public responsibility: is the duty of the state to create the conditions for realization of the right to social security and to organize, coordinate and support the Social Security system conditions;
- Complementarity: consists in the articulation of the various forms of social protection, public, social, cooperative, mutual and private aiming to improve the coverage of the situations covered and promote the sharing of responsibilities at different levels of social protection;
- Unity: presupposes the articulation of different systems, subsystems and Social Security schemes towards harmonization and complementarity;
- Decentralization: manifests the autonomy of institutions, with a view closer to the population, within the organization and planning of the system and the rules and guidelines nationwide, as well as the supervision and oversight of public authorities;
- Participation: involves the accountability of stakeholders in defining, planning and system management and monitoring and evaluation of its functioning;
- Effectiveness: is the timely provision of benefits legally provided for adequate prevention and repair of eventualities and promotion of decent life;
- Protection of acquired rights and rights in education: aims to ensure respect for these rights;
- Judicial guarantee: assures stakeholders access to the courts in due time, to assert their right to benefits;
- Information: is the dissemination to all persons, whether their rights and duties, whether their situation before the system and its personalized service;

In present days, Social Security Systems are essential to the welfare of the workers, their families and all society. According to the document “Social Security: A New Consensus”, the access to Social Security is a basic right of all human being and it represents a fundamental instrument, promoting cohesion, peace and welfare. It prevents poverty, stimulates the social solidarity and the equitable repartition of wealth, looking for the dignification of the people.

Before proceeding, it is important to explain that most developed countries usually have a Pay-As-You-Go system. This means that the system is based in a repartition scheme without a significant stock of savings to face future necessities and the fulfillment of government obligations to the beneficiaries is dependent on the growing of wages (wages are the contributory basis). In long-term, Pay-As-You-Go systems are susceptible to fail and to present sustainability problems. In the case of Portugal, the concerns about the sustainability are many as it will be explained in the following sector.

2.2. Social Security System in Portugal

2.2.1. Brief Story

Social Security System in Portugal was born in 1935 (Law n.º 1 884, 16th of March of 1935), created to protect the employees of industry and services. By that time, it was very different from nowadays. It was a very rudimentary system. Significant alterations were not introduced during the following years. For example, in 1960, only 50% of all employees were contributors. This situation was maintained till the Revolution of 25th of April of 1974. After that, many changes have been introduced and they will be explained in detail, when analyzing the values referent to the evolution of receipts and expenses of Social Security System, in Portugal.

In order to understand how the Social Security System works, it is important to see how it is architected. The private sector is divided in three groups: General Scheme Contribution; Special Social Security Scheme for Agricultural Activities; Non-Contributory Scheme and Similar. The second scheme (Special Social Security Scheme for Agricultural Activities) has been closed to new contributors since 1986 and it is also estimated that it will be extinguished in 2025. The third scheme (Non-Contributory Scheme and Similar) serves those who have never contributed for the system, but the government provides a pension for the beneficiaries of it.

The Revolution of 25th of April of 1974 represented an important event, influencing many things in Portugal. One of them was the Social Security System. In 1984, government undertook a major reform which expanded the universe of beneficiaries and generously the

benefits, consecrating some measures adopted after the 25th of April of 1974. Increasing the benefits and the beneficiaries aggravated the sustainability of Social Security System. Later, in 1990, pensions' funds were introduced with too much publicity towards them and to their advantages. In 1993, benefits of public and private sectors were approximated⁶ (pension's formulas were changed). The employees recruited by the public sector after 1993 had the same pension's formula of the ones of the private sector. However, this reform will only have financial effects in 2030 (public sector's employees usually get retired after at least 36 years of working). If the widow's pensions are considered, probably it will take even more years to cause financial effects. With the changes introduced in pension's formula, government wanted to promote later retirement. In fact, before the reform of 1993, public sector's employees could retire by the age of 60 and now they only can at the age of 65.

2.2.2. Portuguese Social Security System: The Figures

A closer look to the evolution of Portuguese Social Security System can be given by looking at statistical series for expenditures and receipts. It is necessary to study some variables, using for the effect time series. The first one is called "Receipts of Social Security: total and by type"⁷. As the title of the time series suggests, it demonstrates the absolute values of the receipts of the social security, in nominal terms. First of all, the receipts of social security are divided in two main types: Current Receipts and Non-Current Receipts. The first ones include contributions, incomes, additional assignment of VAT and other current receipts. The second ones are constituted by current transferences, capital receipts and capital transferences (fig. 2.1.). This time series allows analyzing the main sources of receipts of the Portuguese Social Security System in the period between 1977 and 2012.

Historically, the absolute value of receipts in nominal terms has been increasing (fig. 2.2.). In 2002, an increase above the trend occurred, mainly because the total non-current receipts grew 139,7% (it increased from 3,47 million euros in 2001 to 8,32 million euros in 2002). This growth of non-current receipts was especially due to a growth of 1906,5% of the capital

⁶ The employees of private sector become eligible to receive the reform, when they get 65 years of age and if they have contributed for 15 years. In case of incapacity (70% or at least 66,6%), a minimum of 5 years is enough. In order to receive pension in case of unemployment, 36 months of contributions are necessary. To calculate the pension for retirement, it is used the following formula: $P=N*(2\%RW)/140$, P=Pension, N=N° of contribution years, 2%=actualization rate, R=Reference wage. The employees of public sector are eligible with a minimum of 5 years of contributions and at 60 years of age. If they want to become retired before that age, they must have contributed at least for 36 years. Pension formula in this case: $P=(N*W)/36$, P=Pension, N=N° of contribution years, W=Reference wage. Public sector's employees recruited after 1993, retirement pensions are calculated according to the formula of private sector (General Scheme Contribution).

⁷ www.pordata.pt, nominal terms information.

receipts (fig. 2.4.). When analyzing the current receipts (fig. 2.3.), the incomes are featured, because they increased 82,3% between 2001 and 2002 (in absolute values, they passed from 0,10 million euros in 2001 to 0,19 million euros in 2002). Inside current receipts, also the other current receipts got attention with an evolution of 159,4% (in 2001 0,06 million euros and in 2002 0,14 million euros).

Fig 2.1. –Portuguese Social Security System Receipts – Structure of Current and Non-Current Receipts.

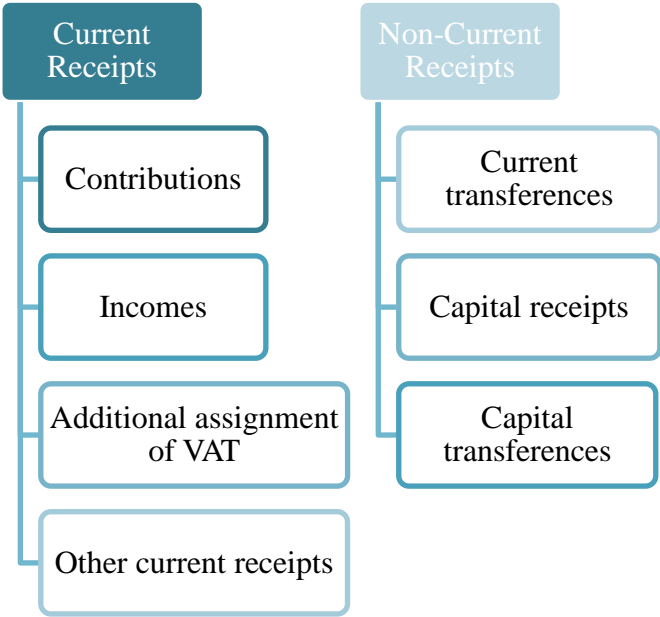
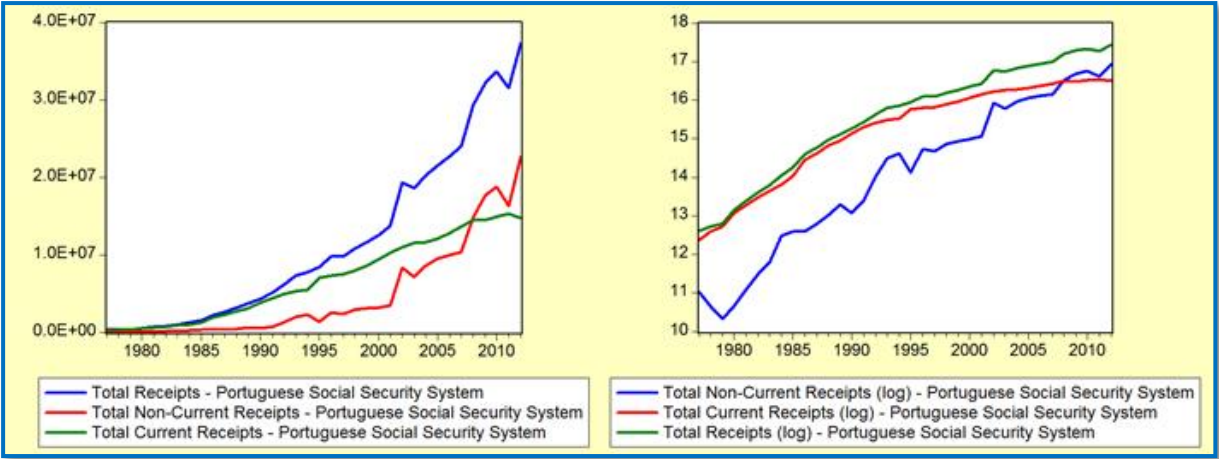
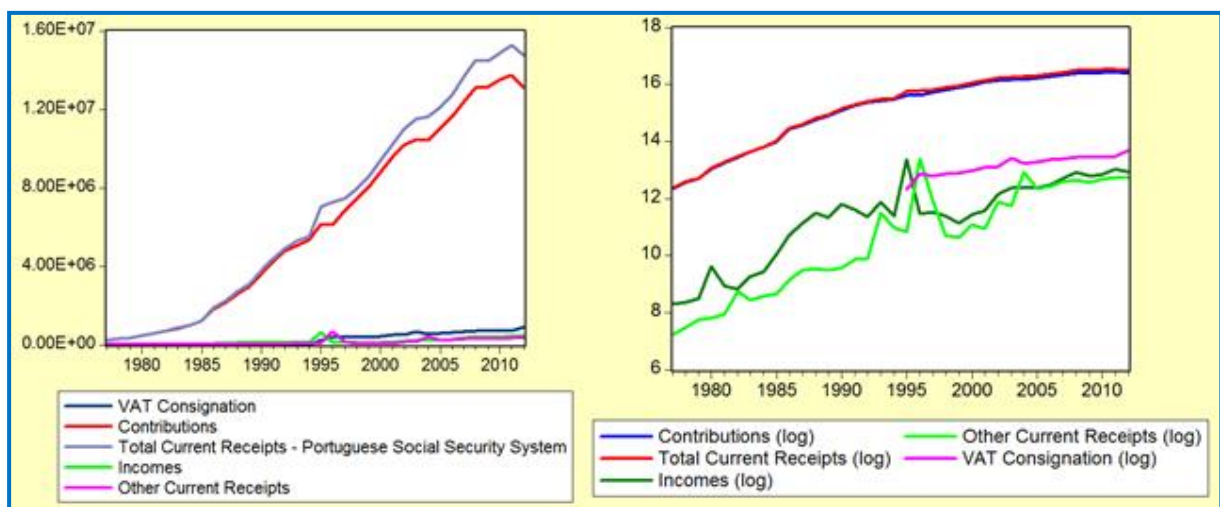


Fig 2.2. – Evolution of total receipts of Portuguese Social Security System (€, nominal terms), between 1977 and 2012 – Current and Non-Current Receipts – Absolute values and log function.



It is not a coincidence that the incomes (in current receipts, fig. 2.3.) and the capital receipts (in non-current receipts, fig. 2.4.) have been the variables with the biggest increases. According to the Institute of Capitalization Management Fund of Social Security (the Portuguese IGFCSS – *Instituto de Gestão de Fundos de Capitalização da Segurança Social*), in their 2002 annual report, this year was characterized by a general fall in equity markets, having reflections in world market indices. Towards this fact, it was adopted a conservative posture, guaranteeing safer investments. Using this strategy, the Institute of Capitalization Management Fund of Social Security obtained very positive incomes. As a consequence, the Social Security Financial Stabilization Fund (the Portuguese FEFSS – *Fundo de Estabilização Financeira da Segurança Social*) strongly increased its values.

Fig 2.3. – Evolution of current receipts of Portuguese Social Security System (€, nominal terms), between 1977 and 2012 – Total Current Receipts, VAT Consignation⁸, Contributions, Incomes and Other Current Receipts – Absolute values and log function.

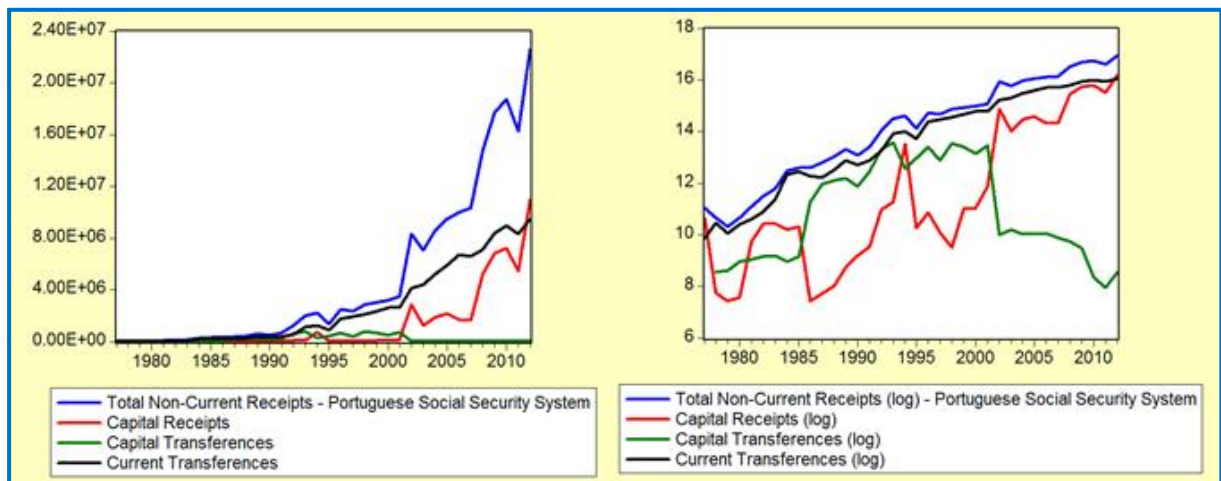


After 2002 and looking at 2003, the values that had grown in 2002 retreated, especially capital receipts (non-current receipts, fig. 2.4.). These ones decreased from 2,83 million euros in 2002 to 1,22 million euros in 2003. This negative evolution was enough to make the total receipts (current and non-current receipts fig. 2.2.) decrease 3,8% in the same period. Reading the annual report of 2003 of the Institute of Capitalization Management Fund of Social Security, that year was characterized by the adoption of a new investment politics which

⁸ The additional assignment of VAT has been accounted only since 1995, because VAT started to have a social component only in 1994 (named Social VAT).

aimed to produce effects in 2011. The main goal of this was to obtain higher performances and incomes in the financial applications, changing the kind of investments, but maintaining the same level of risks of having Portuguese treasury bonds.

Fig. 2.4. - Evolution of non-current receipts of Portuguese Social Security System (€, nominal terms), between 1977 and 2012 – Total Non-Current Receipts, Capital Receipts, Current Transferences and Capital Transferences – Absolute Values and log function.



From 2003 to 2010, the total of receipts grew constantly. But from 2010 to 2011 the total receipts decreased from 33, 63 million euros to 31,52 million euros (-6,26%). This negative evolution was caused by the reduction of the capital receipts in 24,5% (2010: 7,23 million euros and 2011: 5,45 million euros). Such reduction was a consequence of a loss of 11% on investment assets detained by the Social Security Financial Stabilization Fund. According to the annual report (2011) of the Institute of Capitalization Management Fund of Social Security, the reductions in receipts were caused by some characteristics of the assets detained (which lost value), by the economic context (living an economic crises which will be explained in detail in chapter III and by the impact of austerity's measures that reduced the incomes of the families.

Comparing to 2011, 2012 registered a recuperation reflexed in the 18,4% growth of the total of receipts (current and non-current, fig. 2.2.). In 2011 the total of receipts was 31,52 million euros and in 2012 it was 37,32 million euros. Capital receipts (fig. 2.4.) assumed an important role in this recuperation, growing from 5,45 million euros in 2011 to 10,96 million euros in 2012 (in percentage this means 101,1%). In fact, the annual report (2012) of the Institute of Capitalization Management Fund of Social Security explains that the investments detained by the Social Security Financial Stabilization Fund were valorized in 23,32%. It also

received transferences obtained by selling houses of the social security system and values from the budget surplus.

After analyzing the evolution of receipts by kinds, it is important to compare them (fig. 2.2.). The non-current receipts have been increasing, having become higher than the value of current receipts since 2008 (current receipts were 14,49 million euros and non-current receipts were 14,79 million euros).

Until 2000, the behavior of non-current receipts used to be stable without big changes (fig. 2.4.). But in 2001 a new period started, with positive and significant evolution of this kind of receipts. In fact, since 2001 non-current receipts have been growing, contributing for a very positive evolution of the total of the receipts. After all it has been said, such evolution in non-current receipts was expectable (especially when reading the conclusions of annual reports of the Institute of Capitalization Management Fund of Social Security). The year of 2001 represented a change in the Institute of Financial Management of Social Security (the Portuguese IGFSS – *Instituto de Gestão Financeira da Segurança Social*), because of the introduction of the New Law of Bases (New Law of Bases of Social Security – Law nº 17/2000, 8th August which was revoked by the nº1 of the article nº 132 of the law nº 32/2002, 17th December), which brought a new financing model, the creation of a new reserve fund and a new pension formula. Also in 2001, it was created an Official Plan of Accounts of the Institutions of Solidarity and Social Security System (the Portuguese POCISSSS – *Plano Oficial de Contabilidade das Instituições do Sistema de Solidariedade e Segurança Social*). These two changes were responsible for making the Social Security System the first and the only sub-sector of Public Administration which could maintain the discipline imposed by the Official Plan of Public Account (the Portuguese POCP – *Plano Oficial de Contabilidade Pública*).

Continuing the analysis, it is evident that the contributions represent the biggest part of the current receipts (fig. 2.3.). In the non-current receipts, capital receipts occupy the first place (fig. 2.4.).

Between 1977 and 2007, current receipts were the main portion of total receipts (fig. 2.2.). But in 2008 this situation changed and, for the first time in the period in study, non-current receipts became superior to current receipts (in 2008, current receipts were 14,49 million euros and non-current receipts were 14,79 million euros). In fact and looking at relative values, in 1977 non-current receipts were 20,6% of the total receipts and, in 2012, this percentage was 60,5%.

Contributions (which are an important variable in present study) lost their relative importance between 1977 and 2012. In 1977, contributions were 78% of the total receipts of Social Security, but in 2012 they were only 35% (fig. 2.5., fig. 2.6. and fig. 2.7.). Although their lost in relative importance, the absolute values had a positive evolution: contributions passed from 0,23 million euros in 1977 to 13,08 million euros in 2012. It is important to refer that the contributions alone were higher than the total of non-current receipts till 2007.

Fig. 2.5. – Evolution of current and non-current receipts of Portuguese Social Security System (€, nominal terms), between 1977 and 2012 – All kinds – Absolute values and log function.

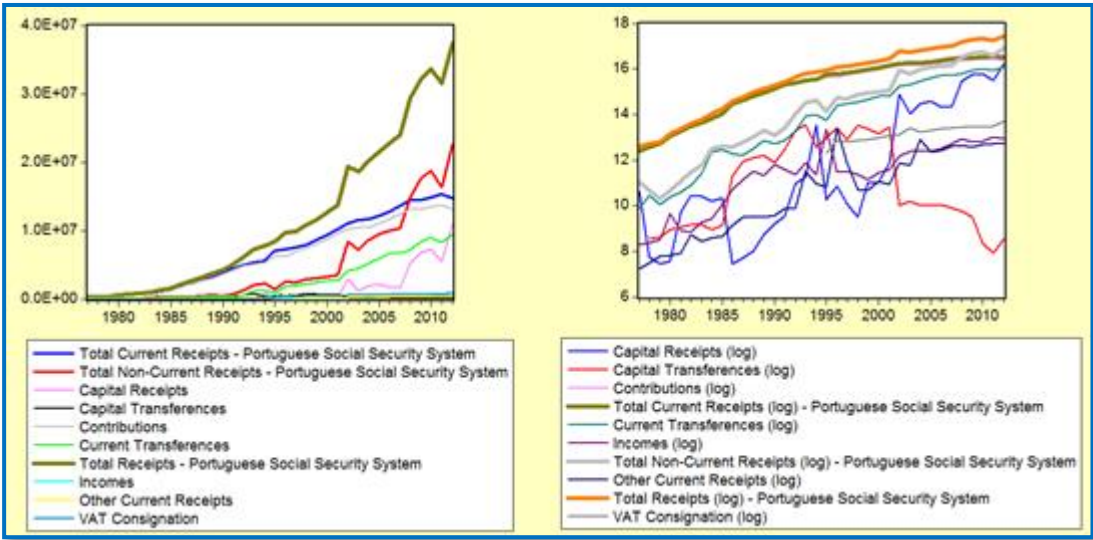
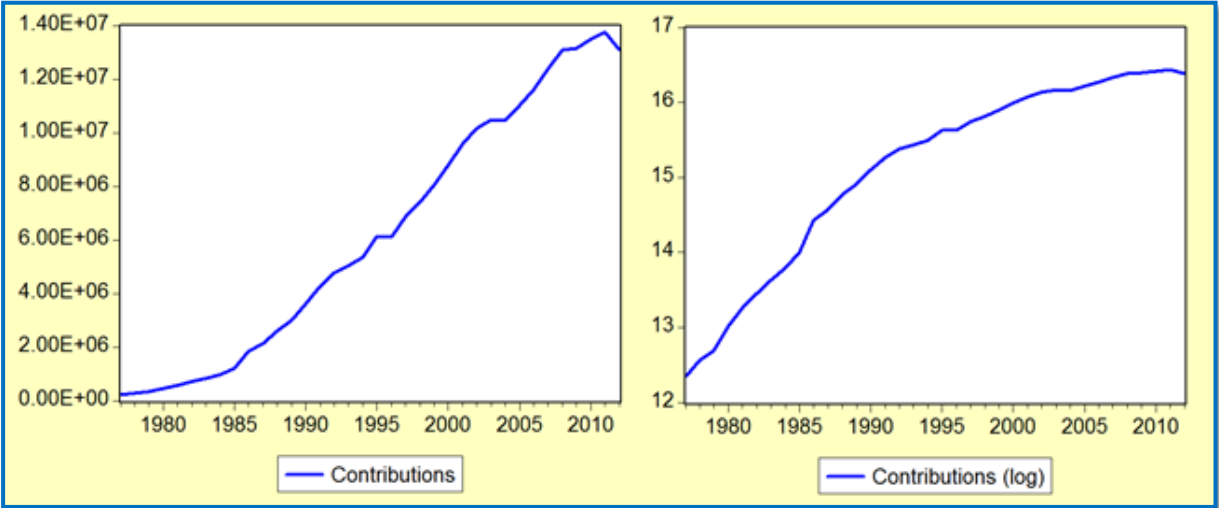
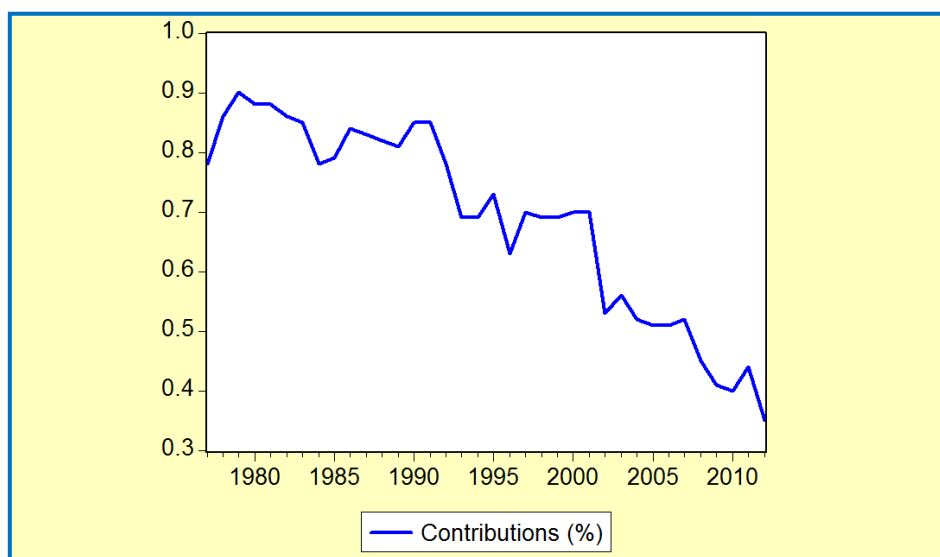


Fig. 2.6. – Evolution of contributions of Portuguese Social Security System (€, nominal terms), between 1977 and 2012 – Absolute values and log function.



Associated to the reduction of the percentage of the contributions (fig. 2.7.) in the total of receipts has been the growth of non-current receipts. These ones increased from 0,61 million euros in 1977 to 22,60 million euros in 2012. In the non-current receipts, the performance of capital receipts was determinant, passing from 0,42 million euros in 1977 to 0,11 million euros in 2012 (an evolution of 26034%).

Fig. 2.7. – *Evolution of contributions of Portuguese Social Security System (€, nominal terms), between 1977 and 2012 – % (Contributions / total receipts of Portuguese Social Security System)*



As it has been said before, it is important to pay special attention to the data contributions (fig. 2.5., fig. 2.6. and fig. 2.7.). First of all, it is important to refer that the contributions to social security system are a tax that employees and employers pay to the state (in this case Portuguese state). The money collected from contributions is used to pay activities related to social providence. In contributory schemes, companies are the most responsible for deduction and payment of this kind of tax contributions. According to present legislation (Law of General Bases of the Social Security System - Law nº 4/2007, 16th January), the amount of contributions is obtained through the application of a contributive tax to the illiquid remuneration (usually the illiquid wage). This illiquid remuneration is known as incidence base. The tax is defined by law and it is defined with reference to the social support index – 419, 22€ in nominal terms (sch. 2.1.).

Looking at the evolution of contributions' percentage in relation to total receipts (fig. 2.7.), some maximums and minimums are identified. The main maximums occur in 1979

(89,7%), in 1990 (85,3%) and in 2001 (69,9%). The minimums are in 1984 (77,7%), in 1994 (69,1%) and in 2002 (52,6%).

From 1977 to 1979 (first maximum), the relative importance of contributions in the total of receipts of Social Security System registered a trend to increase. The Revolution of 25th of Abril of 1974 was one of the causes of such trend. In fact, the return of more than a million Portuguese that were in Angola and Mozambique caused an increase in active population and, as a consequence, of the contributors in the following years. By the same time, the Portuguese soldiers that were in The Colonial War returned to Portugal. In 1974, the 13th month was created which increased the tax base. After the maximum of 1977, the trend changed. The period after the Revolution of 25th of April of 1974 was very instable. Surpassing the initial chaos, a period of nationalization of companies and a downgrading of the economic growth (in 1974 and in 1975, the GDP at constant prices decreased 2,34%; specifically in 1975 it decreased 5,10%) marked the country, causing more unemployment and emigration. As a consequence, active population decreased and so the contributions as well.

Sch. 2.1. – Contribution Tax’ Table.

Entity Type			Contribution Tax			
			Employer	Employee	Global	
Profit Entities			23,75%		34,75%	
Non-profit Entities	Portuguese Institute Of Social Security		2013	20,80%	11%	31,80%
			2014	21,20%		32,20%
			2015	22%		32,60%
			2016	22,00%		33%
			2017	22,30%		33,30%
	Other Entities		2013	21,80%	32,80%	
			2014	22,30%	33,30%	

Analyzing the period from 1979 to 1984 (minimum), in 1980 it was approved a new scheme for tax contributions and for debts in relation to them (Decree-Law n° 103/80, 9th of May). In 1986, the single social tax (the Portuguese TSU – *Taxa Social Única*) started to be applied (tax to be paid for employees – 11% - and for the employers – 24%, fig. 2.2., Decree-Law n° 140-D, 14th of June). About the additional tax of 0,5%, this aimed to contribute to

protection in case of professional disease. In 1990, the 14th month was created. In 1976, with the instauration of 1976's Constitution and the adhesion to EEC, the GDP raised at an annual average rate of 3,19% (GDP raised 36,94% between 1976 and 1985). The increase of the percentage of contributions seen between 1984 and 1990 was consequence of this period of economic growth which caused the creation of employment (more employment means more workers and these mean more contributions). From 1986 to 2001, the GDP grew 86,11%, also with the help of community funds (community funds will be explained with more detail in chapter III). In this period, specifically in 1995, the contribution tax of the employees decreased from 24,5% to 23,75% (sch. 2.1.). In the same year, it was created the Social VAT which means that the VAT started to have a social component to contribute to financing the social security system (reason why it is only considered since 1995).

Mathematically, introducing a new source of receipts, the relative importance (or the percentage) of the contributions decreases. From 2002, it is seen a reduction (fig. 2.7.), year after year, of the importance of contributions, justified mainly for the increase of the importance of non-current receipts (capital receipts assumed 14,7% of total receipts in 2002, fig. 2.5.). The years between 2002 and 2011 were characterized by stagnation, with a total GDP growth of 4,40% for the period and an annual average rate of 0,45%. A rise in unemployment and a reduction in active population were the main causes for the reduction of contributions in that period.

Till now, only economic, political, historical and financial factors have been mentioned to explain the evolution of the contributions to social security system (as referred before, in 1977 those receipts were 77,6% of total receipts and in 2012 were only 35,1%). However there are other factors such as demographic ones (for example the ageing population) that affect the evolution of contributions to social security system. According to the censuses made between 1960 and 2011, the ageing index (this index relates old and young populations, through the quotient between the number of people with ages equal or superior to 65 and the number of people aged between 0 and 14 years) increased 368,1%⁹. In 1960 it was 27,3%, in 1970 34,0%, in 1981 44,9%, in 1991 68,1%, in 2001 102,2% and finally in 2011 127,8%.

However the population ageing index, alone, only explains that the old population is increasing faster than the young population, not being necessarily a signal that active population has been reducing. In fact, if the ageing index had grown only because the increase of average life expectancy (in 1970 the average life expectancy at birth was 67,1 years, while

⁹ Ageing index according to Portuguese censuses – Data source: www.pordata.pt

in 2012 it was 80; the average life expectancy at the age of 65 was 13,5 and 19 years in 1970 and 2012 respectively)¹⁰ it would not be so alarming, because the renovation of young and active population was maintained. However the birthrate also has been reducing, passing from 20,8%¹¹ in 1970 to 7,9% in 2013 (less than half).

Demographically, the population ageing worsens with the increase of the average life expectancy and with the reducing of birthrate. These demographic changes have consequences in 3 levels: the dependence ratio increases (pensioners/employees), the capital stock for person and the more political power for the older. The pension schemes, financed for capitalization or for repartition, always suffer the consequences of the population ageing, mainly with health costs. Overcome such situation passes through increasing the employment, economic growth and more productivity.

All the elements mentioned before have been contributed to the fact that active and young population (those who pay contributions to social security) is progressively decreasing.

Finishing the analysis of Portuguese Social Security System contributions, it is important to refer that, however its importance on total receipts has been reducing (fig. 2.7.), in absolute values it has been increasing (fig. 2.6.). In 1977, the total of contributions was 0,23 million euros increasing to 13,08 million euros in 2012. Such evolution means a growth of 5582,9% in the referred period. Such phenomenon is devoted to the following factors: variation of active population, variation of the base of incidence (wages) or tax variation.

Considering the variation of active population (from 15 to 64 years), the results were¹², in 1981, 6.221.924, in 1991, 6.628. 021, in 2001, 6.978.257, in 2011, 6.981.489 and, in 2012 6.933.167. It is easy to conclude that these numbers have not changed in a significant way. However, the results of active population (employed plus unemployed) are lesser than the previous ones¹³ (in thousands): in 1981, 4.367,2, in 1991, 5.101,6, in 2001, 5.325,2 and in 2011, 5.494,8. Using the unemployment rate¹⁴, it is possible to determine how many people were effectively employed in the referred periods: in 1991, 60,7%, in 2001, 58,9%, in 2011, 53,9%, and finally, in 2012, 51,8%.

Analyzing the average salary (which is an important factor with consequences in the evolution of contributions), the base of incidence, this has been increasing. If the single social

¹⁰ Ageing averages rate – Data source: www.pordata.pt

¹¹ Birthrate - Data source: www.pordata.pt

¹² Population in active age (15 to 64 years) - Data source: www.pordata.pt

¹³ Active population (employed plus unemployed) - Data source: www.pordata.pt

¹⁴ Unemployment rate (Employed population by each 100 people at the age of 15 or more) - Data source: www.pordata.pt

tax has incidence over the wages and if they have been increasing, so the contributions also have increased. In 1983, for example, the average salary¹⁵ was 149,90€ and in 2012 914,10€ - a growth of 509,8%.

Last but not least, another important factor is the tax that is charged over the wages (the single social tax, sch. 2.1.). In 1995, for example, the single social tax, applicate to companies with incidence under the wage of the employee, was reduced from 24,5% to 23,75%.

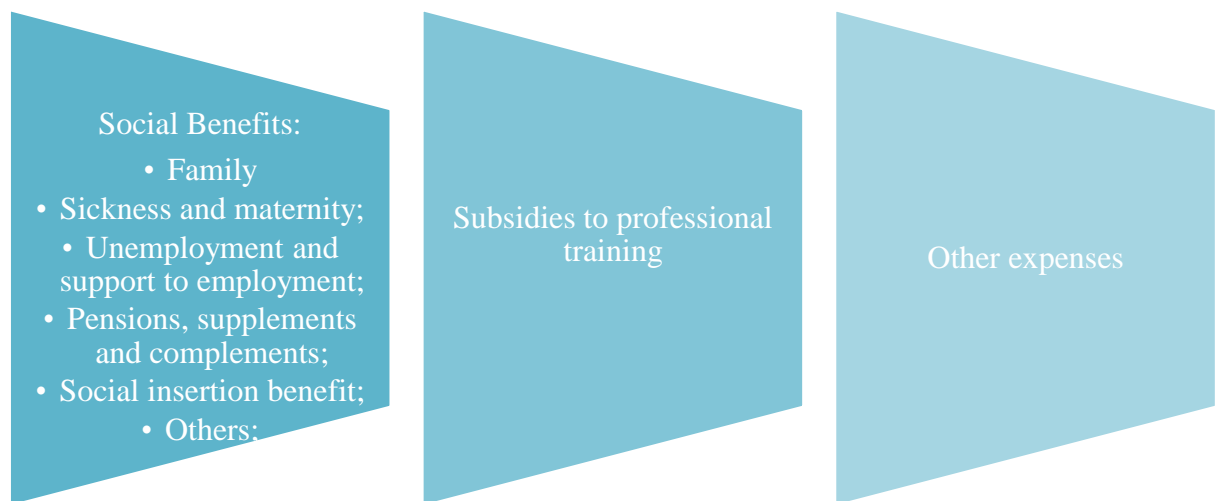
Continuing the description of the Portuguese Social Security System, it is important to study how the expenses are classified. In order to do that, the time series called “Expenses of Social Security: total and by type”¹⁶ represents the results in the period from 1960 to 2012. The fig. 2.8. demonstrates the division of expenses: social benefits (family, sickness and maternity, unemployment and support to employment, pensions, supplements and complements, social insertion benefits and others), subsidies to professional training and other expenses.

At a first glimpse, it is evident that the total expenses of Social Security System have been rising (fig. 2.9. and fig. 2.10.). In 1970, they were 0,03 million euros and in 2012 they summed up to 36,34 million euros (a growth of 1054,8%). In 1977, for instance, the total of expenses in social benefits was 0,20 million euros and the total of all other expenses was 0,10 million euros. This result shows the relevance of the social benefits at the set of expenses. In 2012, the social benefits continued to be the largest part (21,67 million euros which meant 59,6% of the total of expenses). The subsidies to professional training were 1,24 million euros (3,4% of the total) and the other expenses 13,43 million euros (37%). Analyzing with detail the social benefits, pensions, supplements and complements are featured – in 1977 they represented 61,7% of the total of social benefits and 40,7% of the total of expenses; in 2012, 69% and 41,1% respectively (fig. 2.10).

Fig. 2.8. - *Portuguese Social Security System Expenses –Social Benefits, Subsidies to Professional Training and Other Expenses.*

¹⁵ Average salary of employees on behalf of others - Data source: www.pordata.pt (sch. 2.2)

¹⁶ www.pordata.pt , nominal terms information.



There are some details that must be considered. About the social insertion benefit, this only exists since 1996, because that is when it was created (Law n° 19-A/96, 29th of July). By that time it was called the minimum income, used to benefits and social inclusion program.

Fig. 2.9. - Evolution of total expenses of Portuguese Social Security System (€, nominal terms), between 1977 and 2012 – Social benefits, subsidies to professional training and other - Absolute values and log function.

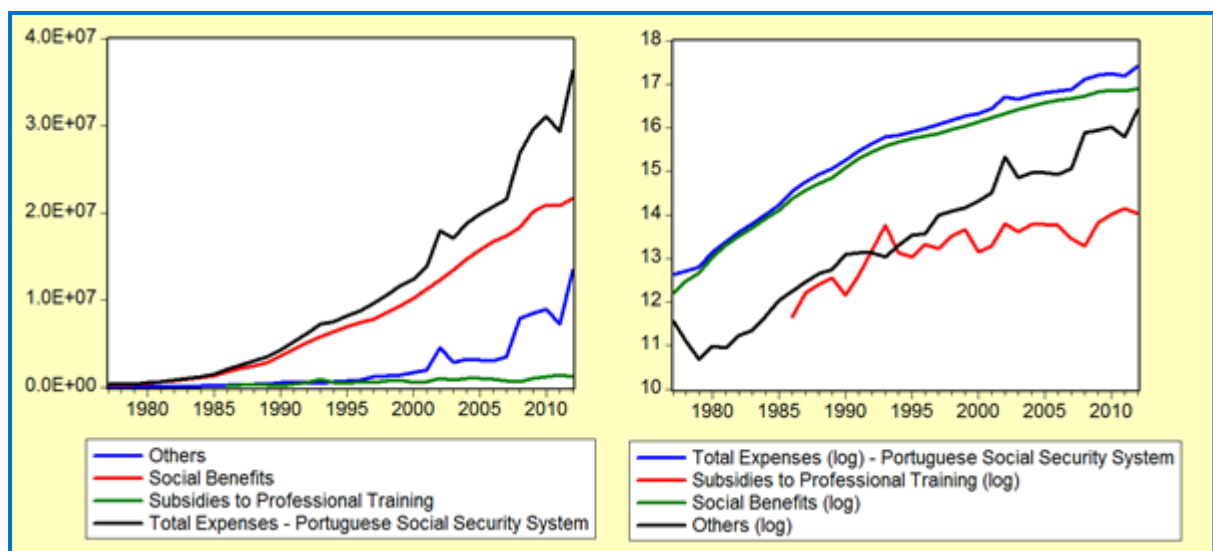
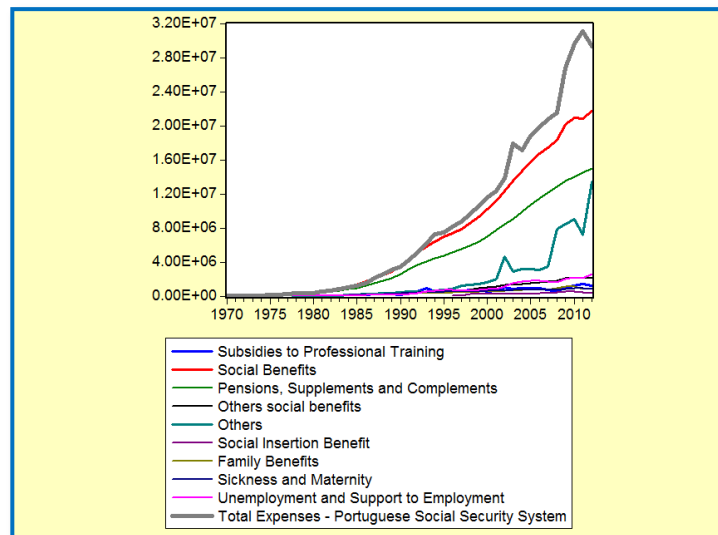
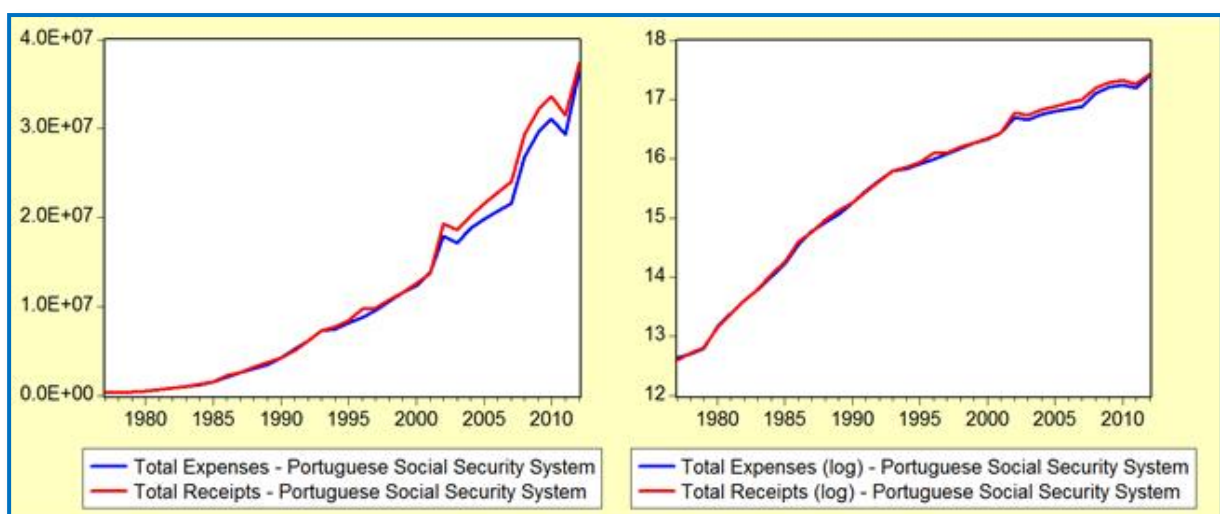


Fig. 2.10. - Evolution of total expenses of Portuguese Social Security System (€, nominal terms), between 1977 and 2012 – Social benefits (family benefits, sickness and maternity, unemployment and support to employment, pensions, supplements and complements and social insertion benefit), subsidies to professional training and other - Absolute values.



It is also important to compare the total receipts and expenses. Between 1977 and 2012, the expenses increased 117,79%, while the receipts in the same period raised 124,82%. In 1977 it existed a deficit of 0,09 million euros and in 2012 a surplus of 0,98 million euros (in 1977, the total receipts of Social Security System was 0,30 million euros and the total expenses was 0,31 million euros causing a deficit of 0,09 million euros) in 2012, the total of receipts was 37,32 million euros and the total of expenses was 36,34 million euros, causing a surplus of 0,98 million euros). Looking at the fig. 2.11. and at the sch. 2.3., it can be concluded that the years of deficit were 1977, 1980, 1981, 1983, 1987, 1991, 1992 and 2001. All the others registered surplus.

Fig. 2.11. - Evolution of total receipts and of total expenses of Portuguese Social Security System (€, nominal terms), between 1977 and 2012 – Absolute values and log function.



After all it has been said, it is important to resume some important ideas. The sustainability of social security system has been discussed all over the world, especially in developed countries, for many reasons. Portugal is no exception. In long term, mainly because of the demographic phenomenon like the ageing of population, sustainability of social security system is in risk. However, some doubts persist about if this is the only factor determinant to future unsustainability. The results analyzed in the chapter II show that, despite some demographic ratios demonstrate the ageing of Portuguese population, the social security system has proceeded to adaptations along time that have allowed to maintain its sustainability. Example of that is the higher diversification of sources of receipts and the growth (in nominal terms) of their amounts.

The way to guarantee the sustainability of social security (or at least not to deteriorate it) passes through the stimulation of employment and productivity. At the same time, it is necessary to control clandestine and not protected work, to be incisive in debt's recuperation, to stimulate the employment in older people, women and disabled people, between many other examples.

In the chapter III, companies in Portugal are going to be object of study, in order to understand their role in social security system.

Chapter III

3. Companies

3.1. The role of Companies

Companies have had a fundamental role in societies among the centuries. It is thought that the concept of entrepreneurship has born in the XVth century, in order to describe the traders who used to travel to the east, creating new commercial relationships. In fact, during the Neolithic, as a consequence of men adopting a sedentary life style in spite of a nomad one, the first kinds of industry started to appear (bread and weaving). Later, in old civilizations (old Egypt, Phoenician and Mesopotamia), some developments occurred that caused the creation of first official banks, the division of work, the planning of main cultures, the born of new markets, the development of agriculture and the livestock and a new organization of private property. In classic civilizations (Old Greece and Old Rome), for the first time, a new global economy appeared and the companies were essential to create a network of activities. Later, in Hellenistic Age, the production and the trade coordinated by the government were stimulated, with fiscal and mercantilist interests. During the Middle Age, cottage industries

(corporations of arts and crafts) appeared, with close structures and strongly hierarchical (masters, mates and apprentices). At the age of Discoveries, with the increase of international trades and the proliferation of markets, the commercial capitalism started to be born (with the intermediate between the small cottage industry and further afield). The professional division of work changed to technical division. Meanwhile the commercial capitalism mixed with financial capitalism and, after the Liberal Revolution, the companies started to live according to the technical and scientific developments (handicraft was substituted by machines). Nowadays and since the XIX century, banks and anonymous societies have increased in such a way that influences all the society.

A firm can be defined as a group of productive factors unified under the authority of a person (the entrepreneur) or a group, with the purpose to realize incomes through the production of services and/or goods.¹⁷ Companies can be characterized according to different criterions, namely: activity sector (primary, secondary or tertiary sector), property of production means (private, public or cooperatives), dimension (micro, small and middle or big), legal form (individual, collective, cooperative and complementary groups of companies).¹⁸

Companies have an important role in societies, through their capacity to create employment and to contribute to the wealth and welfare of population. The performance of companies has been related to economic growth and social circumstances, influencing them and being influenced by them. Companies have a relevant importance in the sustainability of Social Security System, guarantying the protection of employees and their contribution to the system.

Specifically to Social Security System, they play an important role. In contributive schemes as the Portuguese one, companies are coated with big responsibilities, namely questions related do deduction and payment of contributions to the Social Security system. Also the Social Security System is extremely important for the employees, representing a human being right and, at the same time, promoting the social cohesion and welfare. Furthermore, it is a factor that influences the labor productivity, while maintaining a skilled workforce healthy¹⁹, facilitating retirement of older workers, as well as the acceptance by all

¹⁷ "TOE 2 – Técnicas de Organização Empresarial", mentioned in bibliography.

¹⁸ "TOE 2 – Técnicas de Organização Empresarial", mentioned in bibliography.

¹⁹ According to Giddens (2001), an interesting question for sociologists is related to the changing nature of diseases in the period of late modernity. Nowadays, in industrialized countries, many diseases seem to be product of the modern era. Insomnia, anxiety, stress, depression, fatigue and

workers. Some measures taken by the Social Security System can determine, in many cases, redundancies or recruitment policies of companies. It should always exist a dialogue between business, labor and Social Security, in order to facilitate cohesion and enhance labor productivity.

3.2. Companies in Portugal

Portugal is characterized by a business macrocephaly, which means that a big concentration of companies exists in specific cities (Lisbon, Porto, Braga, Aveiro and Setubal). Some disparities between rural and urban zones are also verified, supported by the fact companies have not be installed in the first ones, due to limited resources and the precariousness of distribution channels. Also an interior-littoral dichotomy occurs: the interior is less developed and the industries are concentrated in the littoral of the country²⁰.

Since Portugal joined the EEC, it has occurred an effort in order to minimize asymmetries between different regions, mainly using the incentives that have come from the Community and through the fixation of multinationals in less developed regions.

Proceeding with the characterization of companies in Portugal, in 2012 1,06 million non-financial companies existed against approximately 393 thousand in 1990, representing a growth of 171% for the period. From the 1.062.782, 4% were engaged in fishing, 0,1% mining and quarrying, 7% to manufacturing, 0,2% in the production and distribution of electricity, water and gas, 8% construction, 22% to wholesale and retail, 8% hotels and restaurants, 2% for transport and storage, 5% education, 8% to human health and social support and 39% to other sectors²¹. Concerning firms dimension, in 2012, 96,10% of non-financial enterprises were Micro companies, SME's were 3,85% and only 0,08% were Big Companies. Micro Companies have less than 10 employees, SME's have 10 to 249 employees, Big companies have 250 or more employees²².

chronic pain are increasingly common in industrialized countries. The stress has supplanted the common colds as a leading cause of work absenteeism.

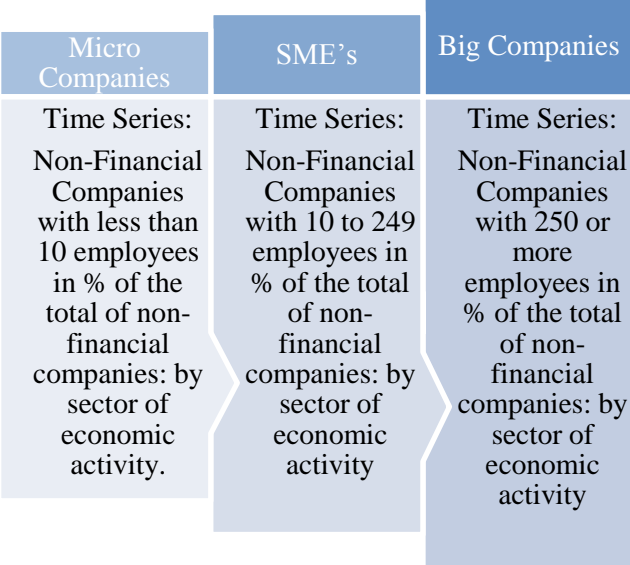
²⁰ In 1996, it could be read in the Portuguese magazine *Exame* the following article: "Definitively Portugal is betting more and more in becoming a country of services. The tertiary sector (commerce and services) already represents 70% of the Portuguese companies' universe. Only considering the number of companies in activity. In turn, the secondary sector (industry) represents 26% of the same universe. In falling is the primary sector, which is 4% of companies. These are some conclusions of the study made by MOPE – Information for the Management of Companies – in March of 1996. This work includes the analyzing of a total of 281238 companies. The study also shows that 1/3 of the Portuguese companies are fixed in Lisbon, showing a macrocephaly of capital."

²¹ Non-Financial Companies: total and for sector of activity - Data source: www.pordata.pt

²² www.iapmei.pt

It is important to distinguish non-financial companies from financial ones, because the first ones are the object of study of the present thesis. Financial companies (usually they are credit institutions and financial societies) have as main function financing the economy. Non-financial companies correspond to units of production of services and or goods with autonomy to take decisions, mainly about the use that is given to their resources. The reason why the present thesis insides over the non-financial companies is that banks and other financial companies have been characterized for having specific funds of pensions, contributing in part for them and not for the Social Security System. Recently this situation has been changed, but not during the most period in study. Only in 2010 it was established that bank workers, for example, would start to contribute for the Security System, in order to receive in the future a retirement’s pension provided by this system. Another reason is that it is only pretended to study the impact of productive industry in the receipts of Social Security System.

Fig. 3.1. – *Structure of companies’ division.*



The time series chosen for analyzing are²³: i) “Non-Financial Companies with less than 10 employees in % of the total of non-financial companies: by sector of economic activity”; ii) “Non-Financial Companies with 10 to 249 employees in % of the total of non-financial companies: by sector of economic activity”; iii) “Non-Financial Companies with 250 or more employees in % of the total of non-financial companies: by sector of economic activity”²⁴; iv)

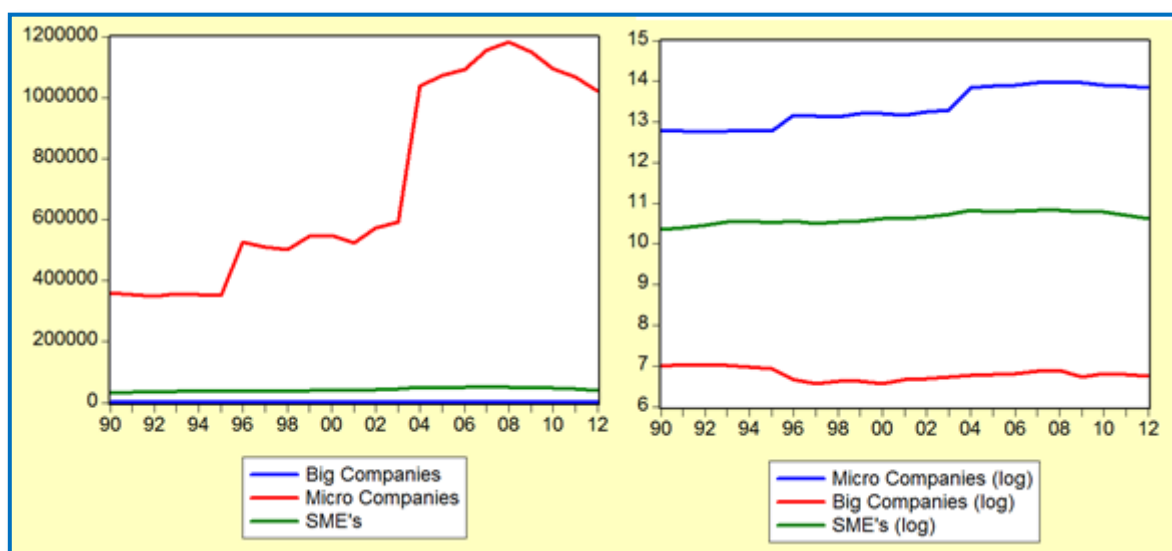
²³ www.pordata.pt

²⁴ The sector of economic activity is not relevant. It corresponds to information that is not needed for the present study.

“Non-Financial Companies: total and by sector of economic activity”; v) “Employees in non-financial companies: total and by raking of employees”.

The referred time series only include results since 1990. Their data source were, till 2003, the Annual Questionnaires made to Companies. These questionnaires were created in 1986, replacing the procedure before called Surveys to Companies. In 1990, a new official accounting plan (the Portuguese POC – *Plano Oficial de Contabilidade*, replaced by another system in 2009, the Portuguese SNC - *Sistema de Normalização Contabilística*) was instituted, obligating to change how the information was collected. Since 2004, data source have been the System of Integrated Accounts of Companies.

Fig. 3.2. - Evolution of companies, according to their number of employees (Micro Companies, SME's and Big Companies), between 1990 and 2012 – Absolute values and log function.



Analyzing with detail the time series in study, between 1990 and 2012, it can be seen that the structure of companies²⁵ in Portugal, according to their dimension (Micro, SME's and Big companies)²⁶, did not change in a significant way (fig. 3.2. and 3.3.). In 1990, Micro companies represented 91,70% of the total of companies and, in 2012, 96,10% (in 22 years, they have growth 4,4%). About SME's and Big companies, in the same period, the first ones fall 4,17% (from 8,02% to 3,85%) and the second ones passed from 0,28% to 0,08%. In

²⁵ From this point of the thesis, “Companies” are always considered non-financial.

²⁶ Micro Companies have less than 10 employees; SME's have 10 to 249 employees; Big companies have 250 or more employees.

absolute values and in global, in 1990 392.516 companies existed in Portugal and in 2012 this number was 1.062.782. In percentage, such growth means 171%. The Micro companies and SME's increased 184% and 30% respectively, while the Big companies decreased 23%.

Looking at the number of employees in each kind of company (fig. 3.4.), in 1990 SME's were the ones who employed a higher number of workers (994.197). Micro and Big companies employed 813.992 and 652.886 respectively. Two decades after, in 2012, the scenery changed and Micro companies occupied the first place in employing people. In 2012, they employed 1.580.969 employees, while SME's abridged 1.181.354 workers and Big companies a total of 749.343. In relative numbers (fig. 3.4.), in 1990, micro, SME's and Big companies a total of employed respectively 33%, 40% and 27% of the total employers. In 2012, the values were, in the same order, 45%, 34% e 21%.

Fig. 3.3. - Evolution of companies, according to their number of employees (Micro Companies, SME's and Big Companies), between 1990 and 2012 – % - Micro Companies / Total Companies, SME's / Total Companies and BIG Companies / Total Companies.

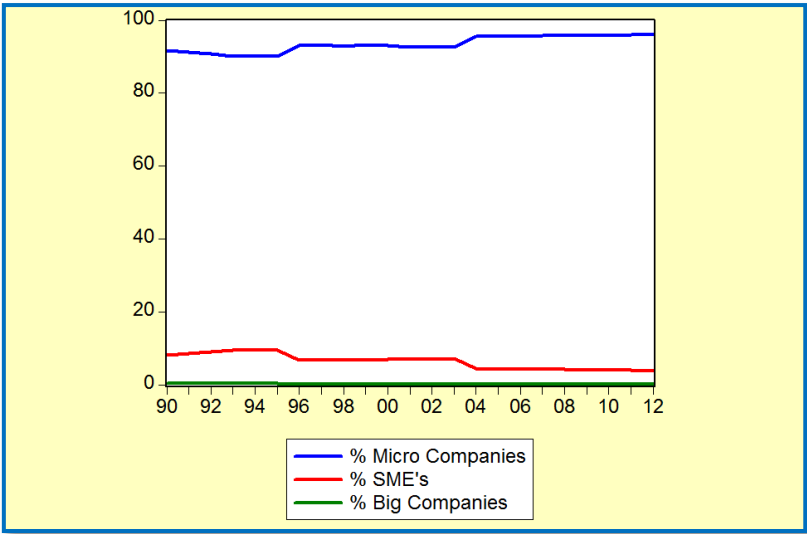
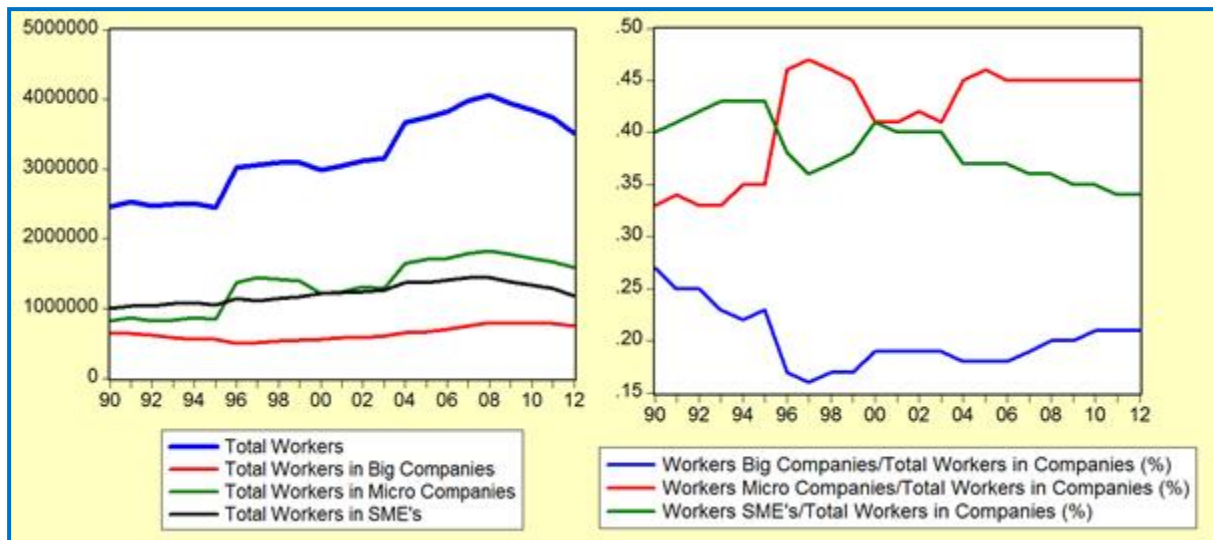


Fig. 3.4. - Evolution of workers in companies, according to their number of employees (Micro Companies, SME's and Big Companies), between 1990 and 2012 – Absolute and relative values (%).



Considering the presented elements, it is important to analyze which circumstances and phenomena influenced them. The period between 1990 and 2012 was characterized by many and significant changes. Between 1986 and 2001, as a consequence of Portugal having joined EEC and the creation of the Euro currency, the GDP grew 86,11%, at an annual average rate of 3,96%. Such growth was due to, in some way, the community funds that Portugal received, aimed to modernize the economy and the industry. In fact, through the structural funds (SEF²⁷, EFAOG²⁸, EFRD²⁹ e EFFO³⁰) and of cohesion³¹, Portugal received a total of 80 900 million euros, between 1986 and 2011, which means 9 million euros per day. These funds had as aim to promote the development of backward regions, the reconversion of old industrial zones, the support to long term unemployed people, the professional insertion of young people, the modernization of agricultural structures and the development of less developed rural regions.

In 1986, it was possible to read: “To Portugal, joining the EEC means, after the loss of its colonies and the overcoming of the inside political problems, a return to its origins: the Europe. The EEC offers to Portugal the opportunity to get out definitively of its political

²⁷ Created in 1985, in order to stimulate the creation of employment and the demographic and professional mobility of employees.

²⁸ Introduced in 1964, in order to financing the expenses related to the functioning of agricultural markets, guarantying prices and supporting necessary actions of changing.

²⁹ Created in 1975 with the aim of supporting the investment in infrastructures and in productivity activities.

³⁰ Fishing Orientation.

³¹ The main fund of cohesion was created in 1993, by imposition of the European Union Treated. Its finality was to promote economic and social cohesion between all the state-members, in order to ensure the entrance of Euro. The state-members that received from this fund were the ones which GNP by person was inferior to 90% of the community average (Portugal, Spain, Greece and Ireland).

isolation, opening at the same time a future and the possibility to economically sanitize the country. This acquired confidence, by joining the EEC, will reanimate the industry and, mainly, the necessary investments by the big companies, which, in the years after the revolution [Revolution of 25th Abril of 1974], could only give hesitant steps in that way. At the same time, Portugal expects from the EEC, (...) a help in order to orientate and stimulate the economic restructuration, especially in agricultural sector.”³²

As a consequence of joining EEC, Portugal passed to participate more actively in international markets, which was a determinant fact to its developments. Trades with other EU member-states assumed special importance and, between 1981 and 1990, exports rose from 9,5% to 15,8%, while imports decreased from 31,9% to 18,6%.

However, after a period of economic growth, the Portuguese economy stalled. International changes related to the democratization of Eastern European countries had consequences in all Europe. The competition in international trades increased and the prices of many raw materials, especially oil (oil shock in 1989/90) also increased, unbalancing the accounts with the exterior and aggravating the negative effects of inflation (which caused a decrease of domestic demand and real wages). These events demonstrated that the Portuguese economy was not enough modernized. The decade of 90's represented a consolidation of the Portuguese position in EU, but also corresponded to a time of one of the biggest global economic crises. The GDP decreased and it was negative in 1993, the unemployment increased hugely, industrial and agricultural productions registered, between 1991 and 1994, one of the biggest falls of the all period after-war. Between 1993 and 1994, the real wages decreased and debts increased, especially tax debts and to employees (delays in salaries).

After this period of crisis, Portugal had to make an effort in order to approximate its real economy to the others European economies. For the effect, it had to take measures in order to stop inflation and to promote employment. Meanwhile, Portugal was living a period of nationalization of public companies (which had started in the decade of 80's) and continued during the decade of 90's, aiming the modernization and increasing competition (in 1993, the receipts resulted from privatizations were 800 million euros, 6,4% of the GDP of that year). The adopted politics had effects and the Portuguese economy growth again. 2000 was the 6th consecutive year of economic expansion (GDP rose 3,2% between 1994 to 1999). Such evolution only was possible, due to the measures taken during the preparation of introducing the Euro, to the positive period that was lived during the concretization of new projects (for

³² The European Unification, Luxemburgo 1986

example, the EXPO 98), to the stabilization of inflation, to the decrease of unemployment, to the adjustment of internal consumption, to the growth of exportations, between others.

After this period and during the years after the Euro get into circulation, the Portuguese economy stalled again. Between 2002 and 2011, the intervention of IMF was necessary. In this period, the economy only rose a total of 4,40%, at an annual average rate of 0,45%. To this stagnation many factors contributed, such as the unbalancing of the accounts with the exterior and the growth of debts of the families and companies (consequence of the increase of internal consumption seen in the precedent period of expansion). Another phenomenon was the loss of control over the government debt. The public debt was so high that the state was obligated to pay it, in order to obtain credit in international markets. This situation culminated in asking intervention to IMF and to the European Fund of Financial Stabilization. In 2011, the economy entered in recession, with the PIB decelerating (GDP fall 5,50% in the 2º semester of 2011). In fact, the fall of GDP, in 2012, was the second worse after the Revolution of 25th April of 1974.

Now that the social, economic and political contexts have been explained, it is possible to analyze with more detail the evolution of companies in Portugal. By one side, the growth of unemployment between 1991 and 1994 was a factor that originated the creation of micro companies. Between 1990 and 1996, these companies increased 46% (they passed from 359.937 in 1990 to 526.401 in 1996). In the same period, SME's increased 22% (less than half of the growth of micro) and Big companies decreased 30%. In fact, some unemployed people found in opening a Micro company the solution to their professional situation, getting, in some cases, the opportunity to benefit from European funds referred before. At the beginning of the decade of 90, specifically between 1990 and 1992, the Micro companies decreased, certainly because people thought that the economic crisis that was going on could take less time that it really took. But from 1993 the trend to Micro companies increase appeared again.

Between 1996 and 2003, the evolution of companies was different from the period before. Micro companies increased 10%, SME's 19% and Big companies 19%. This behavior, with emphases on the growth of SME's and Big companies, was due to the privatization politicians that occurred by that time. In fact, the privatization of public companies was a factor of competition and attracted more investment to industries. Portugal became a target to foreign direct investment and the investors, attracted by incomes and by the subsidies related to the funds of EEC, invested in new companies. Furthermore, Portugal had cheap and skilled hand

labor. By this time, the slow rising of Micro companies could be explained by the fact that the unemployment rate had slowed, as a consequence of the increase of SME's and Big companies which were employing more people. In 2004, the increase of companies got into a maximum. In total and in relation to 2003, companies augmented 70%, passing from 639.106 to 1.084.928, mainly because the economic growth verified in the periods before and in the context of adopting the Euro.

From 2004 till 2012, the situation changed. The companies in their total decreased 2%. All kind of companies decreased: micro 1,4%, SME's 18% and big 2%. This period was characterized by stagnation and, in some epochs, for economic recession. The unemployment rate, in 2004, was 6,5% and surmounted to 15,6% in 2012. During this period and in opposite to what happened between 1990 and 1996 in which the increase of Micro companies was associated to unemployment, all kinds of companies reduced. It is important to refer that the reduction of 2% in Big companies had strong influence in the growth of unemployment rate (each big company employs at least 250 people). In absolute values, from 2004 to 2012, the Big companies passed from 868 to 850, traduced in a reduction of 18 big companies and, in the best of the hypothesis, a reduction of 4.500 (250×18) jobs. However, in 2012, big companies were responsible for 21% of all employees.

The stagnation of growth in Portugal in recent years, the sovereign debt crisis, the rising unemployment, the over-indebtedness of households and firms, the use of foreign aid (IMF Troika), the adoption of structural adjustment policies with tax hike and consequent reduction in the disposable income of households (with demand reduction and internal consumption), the uncertainty caused by the social, economic and political instability that represent barriers to investment (investors avoid investing in countries where there are uncertainties to the future, including uncertainties about economic and fiscal policies), among other factors, represent obstacles to the birth of new companies and expansion of the existing ones.

3.3. Conclusions – Companies in Portugal

Before moving to the next section, it is important to underline some ideas. First of all, companies are important elements in the economy and their evolution is dependent of many economic, political and social factors. In fact, they have increased and decreased along time in order to adapt to people's necessities (fig. 3.2. and fig. 3.3.). Therefore, in periods of higher unemployment rates, Micro companies augmented in number; during nationalizations period and European funds entrance in Portugal (mainly to stimulate investment and development of industries), SME's and Big companies increased in number; in time of economic crisis, Big

companies decreased. Such movements had influence in the number of firms' employees and, consequently, in the transferences made from them to the social security system by contributions (more companies, more jobs, more wages and more contributions). For all these facts, it is important the existence of a social dialogue between companies, employees and governments, in order to get consensus and to develop strategies which will benefit all this groups. In fact, if companies operate in a context of fiscal and economic stability, they will feel more confidence to invest in their development, becoming more competitive and productive, at the same time that they employ more people. If the employees feel protected by the government, through the mechanism of Social Security System, and by their employers, through incentives to professional formation or to healthcare solutions for example, they will be more productive. The government in turn, in addition to the role that it plays in the protection of employees (mainly in cases of unemployment, maternity, health-care, protection of the older, younger, women³³ and disabled workers), has to create the fiscal, legal and economic conditions to stimulate the modernization of companies and to combat cases of clandestine and not protected work. Also the recuperation of fiscal debts is a goal that shall be chased by the governments.

Chapter IV

4. The contribute of Portuguese companies to Social Security System – Econometric study

4.1. Empirical model - Description

Recurring to econometric instruments, it is possible to analyze the relation established between the evolution of Portuguese companies (according to the criterion of their dimension by number of employees) and the contributions that are integrant part of current receipts of Portuguese Social Security System. For the effect, the chosen period for the study comprehends the years between 1990 and 2012 and the time series that support it are³⁴: i) “Receipts of Social Security: total and by type” – to obtain the values of contributions; ii) “Non-Financial Companies with less than 10 employees in % of the total of non-financial companies: by sector of economic activity”, “Non-Financial Companies with 10 to 249 employees in % of the total of non-financial companies: by sector of economic activity” and

³³ According to Doyal (1995), in industrialized countries, women declare a level of anxiety and depression twice than men. In general terms, with regard to women's health in developed countries, they live longer than men but have more diseases and suffer more of disabilities.

³⁴ All the time series mentioned from i) to v) have been obtained in www.pordata.pt, nominal terms information.

“Non-Financial Companies with 250 or more employees in % of the total of non-financial companies: by sector of economic activity” – these three time series indicate the percentage of companies, but when the percentages are multiplied for the values of the following time series (iii), it becomes possible to obtain the total of companies (absolute value), according to the criterion of their dimension by number of employees (sch. 4.7.); iii) “Non-Financial Companies: total and by sector of economic activity”; iv) “Employees in non-financial companies: total and by raking of employees” – this time series has the advantage of specifying how many employees exist in each kind of company, according to the criterion of dimension by number of jobs (sch. 4.8.); v) “Average monthly wage of employees: base pay and gain” – multiplying the values of this time series for the ones of the time series before (iv) gives the total or remunerations paid by companies (sch. 4.9.). It is important to refer that the indication of activity sector is not relevant to the present study, being just additional information of the chosen time series.

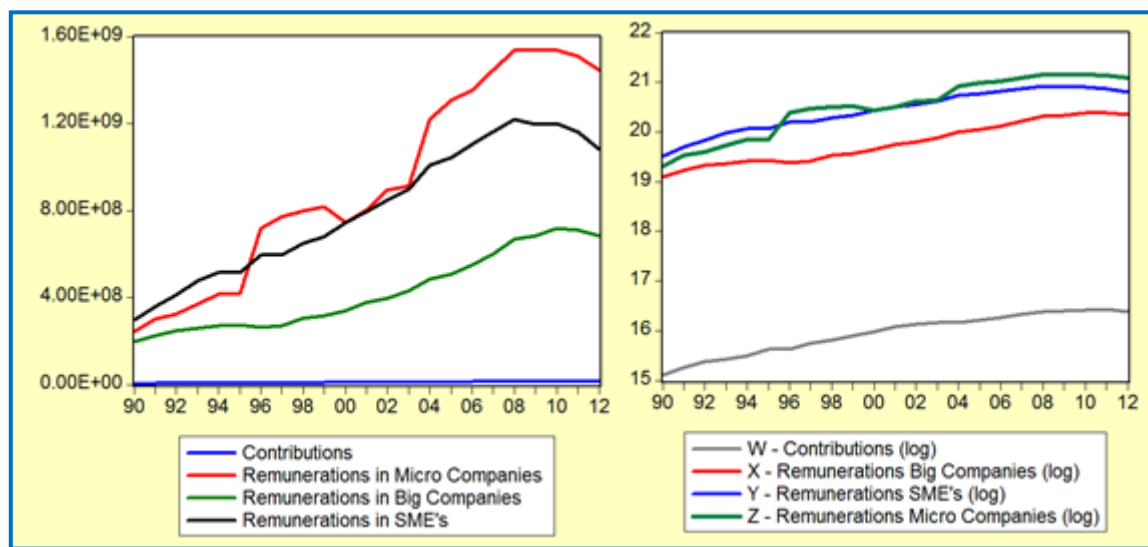
We want to analyze the relationship between the variables, namely how the Portuguese Social Security System contributions are influenced by the total remunerations in Micro Companies, SME’s and Big Companies. For the effect, we start by converting the time series into logs, in order stabilize the time series, making it more linear to be analyzed. Then we estimate the time series first differences to see amplitudes and to analyze deviations from trend. We then apply Hodrick-Precott (HP) filter (to distinguish cycles from trends), correlation matrix (to see co-integration between variables), simple estimation (to see how variations in independent variables affects the variations of dependent variable), lag exclusion test (to indicate the maximum period in the past that influenced the events now), impulse response function (to show for how long variations in independent variables cause variations in dependent ones) and decomposition of variance (to analyze how a variation in a variable is explained by other). To conclude the explanation of the econometric study, it is important to explain that the dependent variable corresponds to contributions and the independent variables are total remunerations in Micro companies, in SME’s and in Big companies, because, being contributions calculated according to a tax applied to remunerations, they depend on the wages of employees.

4.2. Econometric study – Results

4.2.1. Total Contributions and Total Remunerations – Variables Evolution

As it has been said, if the contributions are the result of the application of a tax to remunerations, it is expectable, according to theory, that the evolutions of contributions and of the remunerations follow a similar trend.

Fig. 4.1. – Evolution of contributions of Portuguese Social Security System and of remunerations in companies (€, nominal terms), according to companies' dimension by number of workers, between 1990 and 2012 – Absolute values and log function.



The fig. 4.1. is the representation of the evolution, in the period in study³⁵, of contributions and of remunerations (discriminated by companies – Micro, PME's and Big). Micro companies were the ones who registered more variations in the evolution of remunerations, while Big companies were the most stable. In fact, the remunerations in micro companies increased 492% from 1990 to 2012, at an average annual rate of variation of 9%. For SME's the values were 137% and 6% respectively and for big companies 131% and 6%. Looking at contributions, they growth 262% from 1990 to 2012, at an average rate of variation of 6%. Consulting the sch. 4.1., the results can be seen in detail for every year.

The Big companies have been the ones who less remunerations have paid in the whole period. SME's were the ones who used to pay more remunerations until 1995. After that, Micro companies started to be the ones who paid more remunerations. These variations in remunerations are related to the evolution of the companies explained in chapter III. After the application of the log function to the previous numbers (fig. 4.1.), it becomes easier to see the

³⁵ In the chapter IV, the period in study is always between 1990 and 2012.

trend of all variables. Excepting the Micro companies (that shows some small variations) all the others assume a stable behavior.

Looking at the fig. 4.2. – application of first differences method - more characteristics of the variables can be identified. From 1995 to 1996, shows a significant variation of the remunerations in Micro companies. In fact, when consulting the sch. 4.1., from 1995 to 1996, they increased 71%, while contributions did not vary. That is the biggest variation in all period and of all variables, mostly related to the period of rising unemployment lived in 1996 and explained in chapter III.

Fig. 4.2. – *First Differences' Method, applied to the values (€, nominal terms) of remunerations in each kind of company (Micro Companies, SME's and Big Companies) and to the contributions (€, nominal terms), between 1990 and 2012 (after converting to log function).*

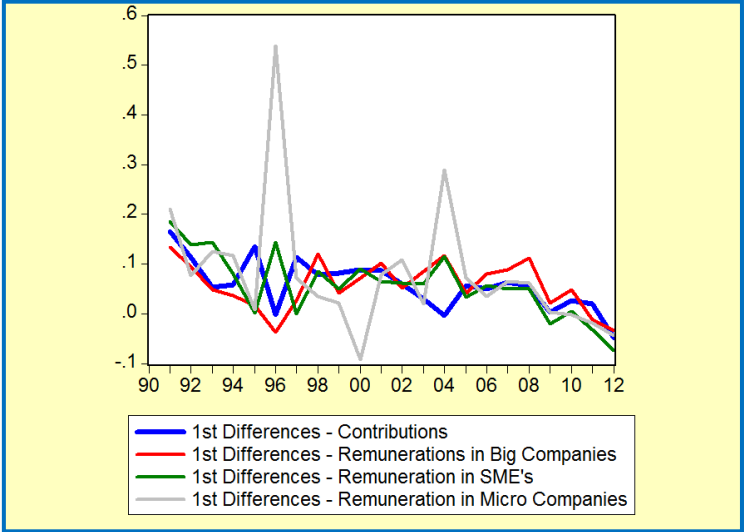
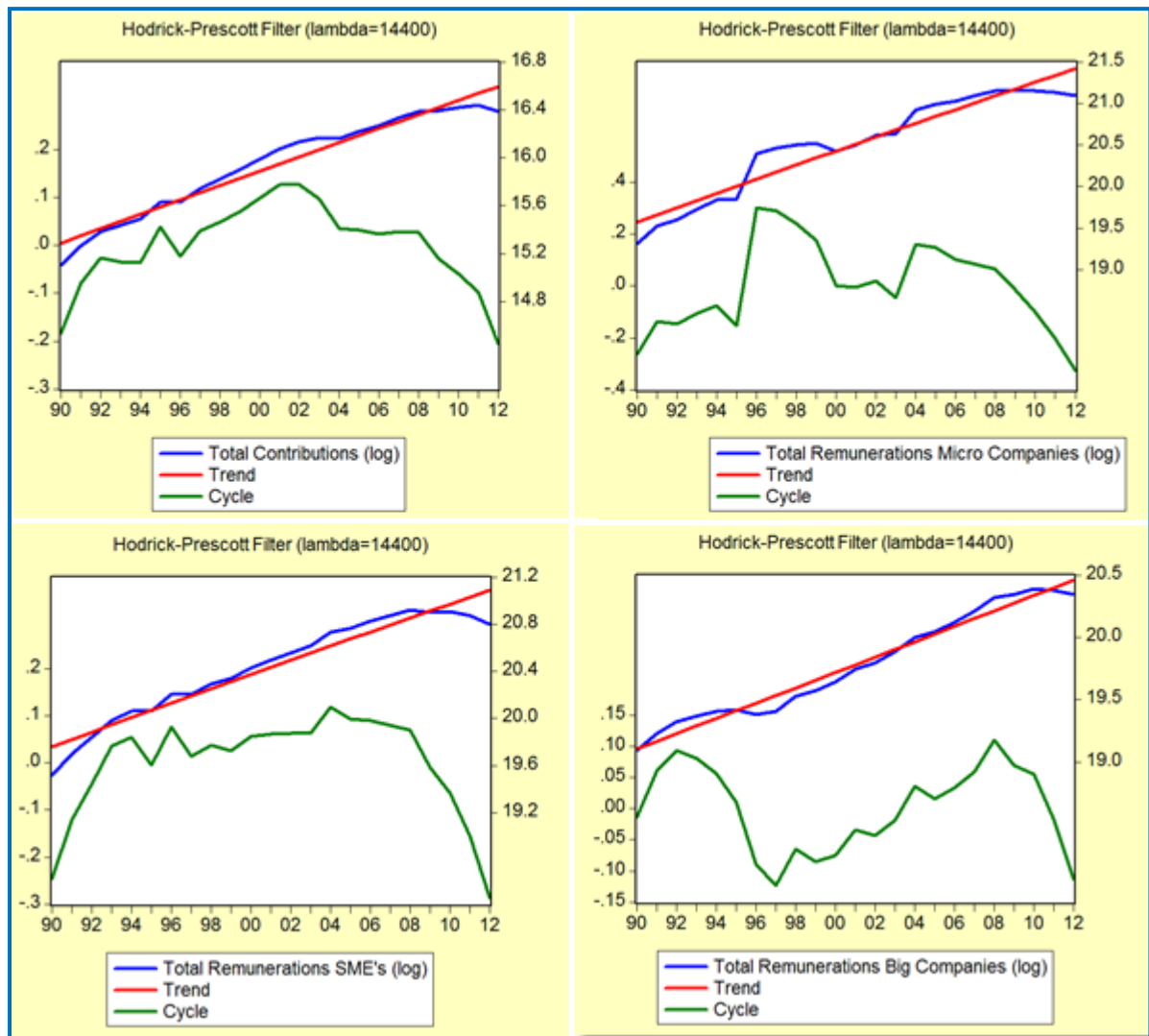


Fig. 4.3. – *Hodrick-Prescott (HP) Filter, applied to the values (€, nominal terms) of remunerations in each kind of company (Micro Companies, SME's and Big Companies) and to the contributions (€, nominal terms), between 1990 and 2012 (after converting to log function).*



Hodrick-Prescott (HP) filter (fig. 4.3.) corroborates the results that have been found till now. In Micro Companies it is evident the 1995–1996 cycle. It also shows that the evolution of total remunerations of Micro companies is more irregular, when comparing to SME's and Big Companies, once it varies more towards its trend. Such results make sense, mainly after reading chapter III. In addition, Micro Companies have more flexibility when it concerns to open or closing companies, to fire or recruit people, to install or uninstall infrastructures, with fewer costs than the SME's or the Big companies³⁶. Paying attention to SME's, remunerations of SME's initially were growing below the trend. Between 1992 and 2009, they varied above the trend and, after 2009, started to grow below the trend again. This is justified for the period of nationalization of companies and the entrance of European funds as explained before,

³⁶ By their dimension, Micro Companies usually have smaller structures than SME's and Big Companies. In many cases, Micro Companies employ, for example, only 1 or 2 employees. In companies with such dimension, measures to change physical installations or to employ and fire people are easier to be taken.

which attracted more investment. In relation to Big Companies, HP filter shows that between 1990 and 1995, they grew above the trend, between 1996 and 2004 below and after that and till 2010 above. Such evolution is related to what it has been explained in chapter III about the evolution of big companies, during the periods of economic growth, of joining the EEC and of stagnation.

4.2.2. Total Contributions and Total Remunerations – Relations between the variables

As it has already been written, the dependent variable corresponds to contributions and the independent variables are total remunerations in Micro companies, in SME's and in Big companies, because, being contributions calculated according to a tax applied to remunerations, they depend on the wages of employees. So it makes sense to find how independent variables affect the dependent one.

Correlation matrix is the first step to study such relation and it can be watched in sch. 4.2.. The values that are underlined in blue are the necessary ones to understand the relation. That results tell us three very important relationships that are: i) to the variation in 1 unit of X^{37} corresponds the variation in 0,958897 units of W^{38} ; ii) to the variation in 1 unit of Y^{39} corresponds the variation in 0,990651 units of W ; iii) to the variation in 1 unit of Z^{40} corresponds the variation in 0,972845 units of W . According to these results, it can be concluded that exists a strong relation between the variables. However, as the correlation matrixes may be erratic, it is important to make other tests, principally considering that the number of observations is 23 (to more observations, the errors tend to be diluted). Actually, despite the fact that the correlation matrix shows the existence of the dependence relationship between X and W , for example, it is unreal that to a variation of 100.000€ of the total remunerations in Big companies corresponds to a variation of 95.889,70€ in contributions. That is the reason why other tests are necessary.

The simple estimation test (sch. 4.3.) is more specific and, with a much smaller probability of error, indicates that: i) to the variation in 1 p.p. of X corresponds the variation in 0,167021 p.p. of W ; ii) to the variation in 1 p.p. of Y corresponds the variation in 0,272761

³⁷ X – Absolute values (€) of total remunerations of Big Companies – between 1990 and 2012, with application of log function.

³⁸ W – Absolute values (€) of contributions – between 1990 and 2012, with application of log function.

³⁹ Y – Absolute values (€) of remunerations of SME's – between 1990 and 2012, with application of log function.

⁴⁰ Z – Absolute values (€) of remunerations of Micro Companies – between 1990 and 2012, with application of log function.

p.p. of W; iii) to the variation in 1 p.p. of Z corresponds the variation in 0,344751 p.p. of W. This results means, for example, if remunerations of Micro companies are 100.000€ and contributions also are 100.000€, to a variation in 1.000€ of remunerations (1% of 100.000€) corresponds a variation of 344,75€ in contributions (0,344751% of 100.000€). In the case of Big companies and considering also remunerations and contributions both 100.000€, to a variation in 1.000€ of remunerations corresponds a variation in 167,02€ in contributions (0,167021% of 100.000€). Applying the same method to the SME's and using the same amount of remunerations and contributions, to a variation in 1.000€ of remunerations corresponds a variation of 272,76€ in contributions. The high R-squared 0,972274 of this test also indicates that most of variation in contributions is practically totally caused by variations in remunerations.

Continuing the study, the application of lag exclusion test indicates also gives some important information (sch. 4.4.). The time is in years, which means that 1 lag corresponds to 1 year. By the test represented in the sch. 4.4., it is possible to see that the ideal lag is 3, because all the criterions⁴¹ indicate that it must be chosen the lag 3. As a consequence, this means that the results of the contributions are influenced by the events occurred 3 years before.

Passing to the analysis of the impulse response function (sch. 4.5.), it allows to conclude 3 things: i) contributions respond positively to a variation in 1 p.p. of remunerations of Big companies during approximately 9 years; ii) contributions respond positively to a variation in 1 p.p. of remunerations of SME's during the whole period; iii) contributions respond positively to a variation in 1 p.p. of remunerations of Micro companies during approximately 4 years.

At last, sch. 4.6. represents the results of the variance decomposition which is explained in the following way: in the first period, all the variance of the W is explained only and totally by the W, but, in the second period, X explains 4,72% of the variance of the W, Y explains 28,98% and Z 0,12%. The most important conclusion to retain from this results is that Y is the variable which most explains the variance of W (in the first period explains 28,98% and then it grows till the percentage of 76,23%). X explains between 4,72% and 11,73% of the variance of W and Z do not explain more than 9,57% (in the last period) of the variance of W. It is important to retain that the variance, in this test, is only explained by the considered

⁴¹ LR, FPE, AIC, SC and HQ.

variables, which means that the variance not explained for one variable is explained for the others.

4.3. Empirical Model – Conclusions

After finishing the econometric study of the variables, it is possible to conclude about the results. In the model that has been studied in present thesis, it was chosen to study how the evolution of companies in Portugal, specifically non-financial companies, has influenced the evolution of contributions. Various time series related to Portuguese Social Security System receipts and firms' contributions were analyzed. After selecting and treating the time series (it was necessary to take only the relevant information for the study and to compare different time series)⁴². Relying on time series techniques, it is possible to conclude that effectively contributions are influenced by companies.

Using the correlation matrix, it was concluded that the relation between contributions and companies exists, but in order to obtain more approximate results of reality, it was applied the simple estimation test from which the numeric relationships between contributions and companies were estimated. Also the amount of time that separates an event on remunerations of companies (an event that causes a variation in remunerations) and their consequences on the contributions was estimated, which helps to understand how long an alteration in the structure of companies will take to cause changes in contributions.

In the future, in other studies, it can also be analyzed the expenses that Portuguese Social Security System has had with companies, relating both sides: transferences from companies to Portuguese Social Security System and the opposite. It could also be interesting to repeat the present study in a few years, extending the number of observations to three decades for example (it will be possible, if norms of accounting do not change significantly, like it happened in 1990 with the introduction of the new official accounting plan, changing the

⁴² To find the number of companies for kind of company, according to the criterion of dimension, it was necessary to multiply the total number displayed on the time series “Non-Financial Companies: total and by sector of economic activity” (which indicates the total number of non-financial companies, but then distinguish them for sector of activity) by the percentages displayed in the following three time series “Non-Financial Companies with less than 10 employees in % of the total of non-financial companies: by sector of economic activity”, “Non-Financial Companies with 10 to 249 employees in % of the total of non-financial companies: by sector of economic activity” and “Non-Financial Companies with 250 or more employees in % of the total of non-financial companies: by sector of economic activity” (which indicate the percentage of non-financial companies by the criterion of number of workers, but does not indicate the number of companies). Another treatment given to time series was to cross the information of the “Employees in non-financial companies: total and by raking of employees” with “Average monthly wage of employees: base pay and gain”, obtaining a new time series which indicates the total of remunerations by each kind of group of companies, according to the criterion of dimension (number of workers).

structure of the annual questionnaires made to companies). Another possible study passes through analyzing how companies contribute to Portuguese Social Security System, according to the criterion of their activity sector. Repeating the present thesis' study, but in real terms and not in nominal terms, is also an interesting challenge. In fact, during the 90's the inflation was stable, in opposite to the 80's, when inflation used to vary significantly.

During the econometric study, some limitations surged. In fact a time series with only 23 observations (1990 – 2012) could cause some problems in applying the econometric technics. In this specific case it did not happen, but if the period was longer and, consequently, had more observations, more conclusions could be obtained with a smaller uncertainty degree. For example, the lag exclusion test made indicated that the results of the contributions are influenced by the events occurred 3 years before. If the period in study was longer, maybe the result of this test could be different. Also the variables found in the simple estimation test, which indicated the numeric relationship between the dependent (contributions) and independent (remunerations) variables, would be more exact considering a higher number of observations. In fact, the method of simple estimation runs the risk of being biased by small samples, especially when the results of observations vary greatly (resulting large amplitudes). In the present study great variations between results were not seen, which made possible to apply this technic to only 23 observations (even before the application of the log function, time series in study did not reveal too many erratic variations).

Conclusion

The present thesis aimed to understand, recurring to descriptive statistics (based on the treatment of data from time series) and econometric methods, the relation established between the Portuguese Social Security System and the non-financial firms that have existed in Portugal, during the last two decades (1990 – 2012), according to the criterion of their dimension by number of workers. Assuming the fact that contributions (part of the receipts of the Social Security System) are dependent on the remunerations of employees that work in companies, it was possible to establish a dependent variable and independent variables, which allowed estimating numeric relations between them (after a previous work of data treatment, recurring to descriptive statistics).

The present thesis, more than just analyzing the relations above mentioned, aimed to describe the social, economic and political contexts in which the variables in study were framed. In fact, the behavior of companies is dependent on many aspects related to the

mentioned contexts. And the Social Security System, through the contribution, partially depends on the performance of Portuguese companies.

One of the first conclusions to be drawn is that there is a multiplier, which indicates how a variation in a monetary unit in wages affects (also in monetary units) the contributions⁴³. In fact, in economics, multipliers are important elements in the establishment of economic relations. This conclusion is extremely useful, mainly concerning to studies that intend to analyze the effects that a decrease (or increase) on companies (according to their dimension by number of workers) has on Portuguese Social Security System and supporting government decisions on rising or not fiscal taxes. Using a specific example, if a Big company, with more than 250 workers, mobilizes to another country, where the hand labor is cheaper than in Portugal, it is possible to measure the direct impact that such relocation will have in Portuguese Social Security System contributions.

Another conclusion that puts in evidence the importance of present thesis is that governments can use a multiplier of this kind, in order to take decisions of fiscal character. For example, a government, on the verge of taking a decision on changing the incident tax burden on workers' wages, may take into account the mentioned multiplier. If the government into account the multiplier effect on its decision, the tax rate to apply may suffer a smaller variation than if the government did not take into account the multiplier effect. In fact, if the government has the goal to increase the contributions and if the multiplier effect is taken account, it may increase the fiscal tax less than not having the multiplier in account, which will have a smaller negative economic effect. In fact, sudden adjustments in the economy may prejudice fiscal consolidation, by contributing to a marked slowing of the economy. If adjustments in fiscal tax applied to wages are high, it will cause reduction on the disposable income of the people. Consequently, the consume will decrease, companies will sell less, profits will decrease and the probability of less competitive companies shutting down will increase (between many other economic negative effects). All this facts make the multiplier that relates remunerations in companies and Portuguese Social Security System contributions an important instrument in economics, mainly useful to fiscal and economic policies.

In addition to be able to predict the approximate variation based on the multiplier, it is also possible to estimate when it will occur. If, for example, the EU admits a new member

⁴³ To the variation in 1 p.p. of X corresponds the variation in 0,167021 p.p. of W; to the variation in 1 p.p. of Y corresponds the variation in 0,272761 p.p. of W; to the variation in 1 p.p. of Z corresponds the variation in 0,344751 p.p. of W.

state, which represents higher competitive advantages for installation companies, and this leads to a massive mobilization of SME's and Big companies to that economy, then it will be possible to measure not only the impact this event will have on the variation on contributions, but also when this variation will occurs, allowing to take new measures to compensate this variation on time.⁴⁴

In general, in relation to Social Security System, an interesting conclusion was taken: it has been adjusting its source of receipts, reducing its dependence of the contributions and increasing the non-current receipts. Such fact reveals that the Portuguese Social Security System has been avoiding its failure, through the diversification of sources of receipts. This brings hope when thinking about the potential unsustainability of the system and, more important, gives time to find solutions that make possible to overcome the inefficiencies originated by the demographic events (ageing of population).

However, the diversification of the sources of receipts may not be enough to avoid the failure of the Portuguese Social Security System, being important to guarantee that more measures are taken, like for example: changing the PAYG to a mixed system, extending the retirement age, adjusting the pension's calculus formula, stimulating births, motorizing interest groups (for example, in older populations, it usually happens that the political power is concentrated in the older ones, which can bias the decision-making in benefit of the older and in prejudice of the younger), controlling and fighting the clandestine and not protected work, promoting the employment in older, younger, women and disabled people, stimulating productivity, improving the healthcare systems (when employees recognize the existence of effective healthcare systems, they have the perception of being more protected, tending to produce more and better, at the same time that professional and other diseases can be avoided, fighting the absenteeism at work and, consequently, stimulating the productivity), creating incentives that make people deserve to work beyond retirement age, between others. The truth is that in all industrialized countries, including Portugal, the Social Security Systems are being analyzed. As societies change, influenced by globalization, migrations and ageing population, also the systems have to change as well.

⁴⁴ Notice that this example (mobilization of companies) only considers the impact on contributions. However, this phenomenon often causes unemployment and, consequently, an increase on the Portuguese Social Security System expenses (social benefits due to unemployment).

At the same time, companies play an essential role. In fact, most of the measures above mentioned result in extending the period of active life of the older employees⁴⁵, which will be traduced in less opportunities to get a job for the younger⁴⁶, if the number the companies do not increase or if the ones that already exist do not recruit more workers. In this context, productivity assumes its importance, being necessary that Portuguese companies become more modernized, competing in a global world with foreign companies. For the effect, investments in modernization must be done, guarantying that are the ones necessary to make the companies effectively more competitive. R&D are also essential, defining how a company can become international market leader in a product or service.

In conclusion, Social Security Systems and companies are extremely related and a dialogue between both is essential to guarantee that both achieve their goals in the future.

⁴⁵ According to Giddens (2001), the productivity and attendance of workers over 65 are higher on average to younger age groups.

⁴⁶ Nowadays, younger also suffer from social exclusion, mainly because the obstacles that face when trying to get the first job in labor market. As a consequence, they start their professional life later and live dependent from the older till later.

Bibliography

Rodrigues, Pedro G. e Pereira, Alfredo Marvão (2007), *A Reforma das Pensões em Portugal*, Lisboa, Fundação Luso-Americana.

Banco de Portugal (2010), “Estrutura e Dinâmica das Sociedades Não Financeiras em Portugal”, *Estudos da Central de Balanços*, Lisboa.

Banco de Portugal (1997), *Séries Longas para a Economia Portuguesa*, Lisboa, BP.

Instituto Nacional de Estatística, *Sistema de Contas Integradas das Empresas 1997 – 1998*, Lisboa, INE.

Instituto Nacional de Estatística (2002), *Sistema de Contas Integradas das Empresas 1998 – 1999*, Lisboa, INE.

Instituto Nacional de Estatística (2003), *Sistema de Contas Integradas das Empresas 1999 – 2000*, Lisboa, INE.

Instituto Nacional de Estatística (2004), *Sistema de Contas Integradas das Empresas 2001 – 2002*, Lisboa, INE.

Instituto Nacional de Estatística (2006), *Sistema de Contas Integradas das Empresas 2002 – 2003*, Lisboa, INE.

Instituto Nacional de Estatística (2006), *Sistema de Contas Integradas das Empresas 2003 – 2004*, Lisboa, INE.

Instituto Nacional de Estatística (2007), *Empresas em Portugal 2005*, Lisboa, INE.

Instituto Nacional de Estatística (2008), *Empresas em Portugal 2006*, Lisboa, INE

Instituto Nacional de Estatística (2009), *Empresas em Portugal 2007*, Lisboa, INE

Instituto Nacional de Estatística (2010), *Empresas em Portugal 2008*, Lisboa, INE.

Instituto Nacional de Estatística (2011), *Empresas em Portugal 2009*, Lisboa, INE.

Instituto Nacional de Estatística (2012), *Empresas em Portugal 2010*, Lisboa, INE..

Instituto Nacional de Estatística (2013), *Empresas em Portugal 2011*, Lisboa, INE.

Instituto Nacional de Estatística (2010), *Indicadores Sociais 2009*, Lisboa, INE.

Instituto Nacional de Estatística (2013), *Portugal em Números 2011*, INE.

Instituto Nacional de Estatística (2014), *Portugal em Números 2012*, INE.

Instituto Nacional de Estatística (2012), *Evolução do Sector Empresarial em Portugal 2004 -2010*, INE.

Estudos do Observatório - Preparação do QREN (2005), “A Economia Portuguesa e o Alargamento da União Europeia”, *Colecção Estudos de Enquadramento Prospectivo do QCA III*, Lisboa, Estrelas de Papel Lda.

Estudos do Observatório – Preparação QREN (2005), “Volume 1 – As grandes questões conceptuais e metodológicas”, *Competitividade Territorial e a Coesão Económica e Social*, Lisboa.

Estudos do Observatório – Preparação QREN (2005), “Volume 2 – Competitividade, coesão e convergência: a óptica global da economia portuguesa”, *Competitividade Territorial e a Coesão Económica e Social*, Lisboa.

Estudos do Observatório – Preparação QREN (2005), “Volume 2 – ANEXO – Competitividade territorial e a coesão económica e social”, *Competitividade Territorial e a Coesão Económica e Social*, Lisboa.

Estudos do Observatório – Preparação QREN (2005), “Sumário Executivo – Estudo sobre a próxima reforma das políticas estruturais”, *Estudos do Observatório – Preparação QREN*, Lisboa.

Godinho, Manuel e Simões, Vítor (2005), “Inovação e Empreendedorismo 2007-2013 – Relatório final”, *Estudos do Observatório – Preparação QREN*, Lisboa, Instituto Superior de Economia e Gestão.

Pedroso, P., Ferreira, A., Dornelas, A., Estanque, E., Centeno, M., Novo, A. e Henriques, M. (2005), “Acesso ao emprego e mercado de trabalho – Formulação de políticas públicas no

horizonte de 2013 – Relatório Final”, *Estudos do Observatório – Preparação QREN*, Coimbra, Faculdade de Economia da Universidade de Coimbra.

Caldas, J., Salavisa, I., Suleman, F., Lopes, H., Costa, P., Valente, A., Henriques, A. e Ferreira, R. (2005), “Adaptabilidade dos trabalhadores e das empresas – Relatório Final”, *Estudos do Observatório – Preparação QREN*, Lisboa, Dinâmia.

Ferrão, P., Conceição, P. e Baptista, R. (2005), “Preparar Portugal para um novo ciclo de fundos estruturais 2007-2013”, *Estudos do Observatório – Preparação QREN*, Lisboa, Instituto Superior Técnico.

Capucha, L., Guerreiro, M., Bernardo, J., Madelino, F., Calado, A., Correia, S. e Silva, A. (2005), “Formulação de Propostas de Concepção Estratégica das Intervenções Operacionais no Domínio da Inclusão Social – Relatório Final”, *Estudos do Observatório – Preparação QREN*, Lisboa, Instituto Superior de Ciências do Trabalho e da Empresa.

Fonseca, A. (2011), *As PME em Portugal: Reflexões e Desafios*, Dissertação de Mestrado em Gestão, Lisboa, Instituto Superior de Ciências do Trabalho e da Empresa.

Silva, V. (2010), *A Atual Estrutura do Sistema Fiscal Português*, Dissertação de Mestrado em Contabilidade, Instituto Superior de Contabilidade e Administração.

Pereira, P. (2009), *A Situação Económica e Social na União Europeia: análise de alguns indicadores*, Dissertação de Mestrado em Prospecção e Análise de Dados, Instituto Superior de Ciências do Trabalho e da Empresa.

Saldanha, E. e Marques, L. (2001), *Sistemas de Financiamento da Segurança Social*, Trabalho de Projeto no âmbito da disciplina de Economia dos Intermediários Financeiros do Curso de Mestrado de Economia Monetária e Financeira, Instituto Superior de Economia e Gestão.

Rutherford, D. (1998), *Dicionário de Economia*, Algés, Difel.

Giddens, A. (2001), *Sociologia*, Lisboa, Fundação Calouste Gulbenkian.

Campos, A. P., Cardadeiro, F. e Esteves, M. J. (1999), *Técnicas de Organização Empresarial – Bloco 1 – Volume 1*, Lisboa, Plátano Editora.

Silva, H.V. e Matos, M. A. (2000), *TOE 2 – Técnicas de Organização Empresarial*, Lisboa, Texto Editora.

Góis, M., Pais, M. J. e Cabrito, B. G. (1999), *Introdução à Economia – 10º ano*, Lisboa, Texto Editora.

Góis, M., Pais, M. J. e Cabrito, B. G. (2000), *Introdução à Economia – 11º ano*, Lisboa, Texto Editora.

Silva, E. e Lemos, J. (2001), *Introdução ao Desenvolvimento Económico e Social – 1º Volume – 12º ano*, Lisboa, Plátano Editora.

Silva, E. e Lemos, J. (2001), *Introdução ao Desenvolvimento Económico e Social – 2º Volume – 12º ano*, Lisboa, Plátano Editora.

Almeida, S., Nunes, H., Cabrita, R. e Pais, A. (2004), *Introdução à Gestão*, Lisboa, Instituto De Formação Bancária.

Pereira, A. M. e Rodrigues, P. G. (2001), “*Ageing and Public pensions in Portugal: A Snapshot before the Reform*”, European Economy – Reports and Studies, Nº 4.

Pereira, A. M. e Andraz, J. M. (2009), “*Social security and Economic performance in Portugal: After all that has been said and done how much has actually changed?*”, College of William and Mary, Department of Economics Working Paper nº 81.

Galasso, V. e Profeta, P. (2002), “*The political economy of social security: a survey.*”, European Journal of Political Economy.

Mathias, D. (2007), “*Fiscal Policy*”, University of California, Department of Economics, Lecture Notes – Chapter 2.

Barr, N. e Diamond, P. (2006), “*The Economics of Pensions*”, Oxford University Press, Oxford Review of Economic Policy, Vol. 2, n.º 1.

(1987), “*Longman Dictionary of Contemporary English*”, Longman Group UK Limited.

Instituto de Gestão Financeira da Segurança Social (2001), “Instituto de Gestão Financeira e da Segurança Social: Relatório de Atividades 2001”. Disponível em: <http://www4.seg-social.pt/>

Instituto de Gestão de Fundos de Capitalização da Segurança Social (2003), “Instituto de Gestão de Fundos de Capitalização da Segurança Social: Relatório e Contas 2002”. Disponível em: <http://www4.seg-social.pt/>

Instituto de Gestão de Fundos de Capitalização da Segurança Social (2004), “Instituto de Gestão de Fundos de Capitalização da Segurança Social: Relatório e Contas 2003”. Disponível em: <http://www4.seg-social.pt/>

Instituto de Gestão de Fundos de Capitalização da Segurança Social (2011) “Relatório de Gestão do Instituto de Gestão de Fundos de Capitalização da Segurança Social: Relatório de Atividade e Contas do Ano 2011”. Disponível em: <http://www4.seg-social.pt/>

Instituto de Gestão de Fundos de Capitalização da Segurança Social (2012) “Relatório de Gestão do Instituto de Gestão de Fundos de Capitalização da Segurança Social: Relatório de Atividade e Contas do Ano 2012”. Disponível em: <http://www4.seg-social.pt/>

Instituto Nacional de Estatística (2006), “Inquérito Anual às Empresas”. Disponível em: <http://www.ine.pt/>

Annexes

*Sch. 2.2. – Evolution of average monthly compensation base, between 1990 and 2012
(nominal terms).*

Year	Average Remuneration	Δ
1990	300 €	
1991	349 €	16%
1992	398 €	14%
1993	443 €	11%
1994	478 €	8%
1995	493 €	3%
1996	522 €	6%
1997	535 €	2%
1998	565 €	6%
1999	586 €	4%
2000	612 €	4%
2001	649 €	6%
2002	685 €	6%
2003	711 €	4%
2004	739 €	4%
2005	765 €	4%
2006	787 €	3%
2007	806 €	2%
2008	843 €	5%
2009	868 €	3%
2010	899 €	4%
2011	905 €	1%
2012	914 €	1%

*Sch. 2.3. - Receipts vs Expenses of Portuguese Social Security System between 1977 and 2012
– Nominal Terms.*

YEAR	Total Receipts (1)	Totas Expenses (2)	1-2
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1977	296.621,70 €	305.931,20 €	-9.309,50 €
1978	333.708,50 €	329.593,40 €	4.115,10 €
1979	362.265,40 €	360.673,20 €	1.592,20 €
1980	512.368,80 €	517.120,90 €	-4.752,10 €
1981	645.705,70 €	650.142,50 €	-4.436,80 €
1982	809.070,70 €	808.612,10 €	458,60 €
1983	973.481,40 €	977.803,30 €	-4.321,90 €
1984	1.257.468,00 €	1.217.131,40 €	40.336,60 €
1985	1.531.091,20 €	1.504.328,90 €	26.762,30 €
1986	2.182.341,50 €	2.072.998,60 €	109.342,90 €
1987	2.569.307,50 €	2.584.568,20 €	-15.260,70 €
1988	3.158.064,60 €	3.044.906,30 €	113.158,30 €
1989	3.690.136,50 €	3.459.022,50 €	231.114,00 €
1990	4.241.765,30 €	4.239.938,00 €	1.827,30 €
1991	5.049.316,10 €	5.170.587,90 €	-121.271,80 €
1992	6.113.920,50 €	6.156.400,00 €	-42.479,50 €
1993	7.258.167,80 €	7.241.581,60 €	16.586,20 €
1994	7.732.769,00 €	7.481.015,80 €	251.753,20 €
1995	8.391.985,30 €	8.145.539,80 €	246.445,50 €
1996	9.748.994,90 €	8.774.826,00 €	974.168,90 €
1997	9.805.304,20 €	9.580.875,50 €	224.428,70 €
1998	10.775.905,10 €	10.599.487,60 €	176.417,50 €
1999	11.585.005,10 €	11.582.140,20 €	2.864,90 €
2000	12.569.106,70 €	12.348.030,40 €	221.076,30 €
2001	13.686.773,20 €	13.786.494,30 €	-99.721,10 €
2002	19.329.318,10 €	17.901.112,70 €	1.428.205,40 €
2003	18.585.649,20 €	17.125.908,50 €	1.459.740,70 €
2004	20.211.658,40 €	18.790.992,30 €	1.420.666,10 €
2005	21.550.706,00 €	19.855.662,70 €	1.695.043,30 €

2006	22.749.676,70 €	20.688.813,00 €	2.060.863,70 €
2007	23.994.259,60 €	21.532.866,80 €	2.461.392,80 €
2008	29.282.871,80 €	26.801.178,70 €	2.481.693,10 €
2009	32.145.215,60 €	29.577.376,80 €	2.567.838,80 €
2010	33.626.862,70 €	31.093.897,60 €	2.532.965,10 €
2011	31.523.225,40 €	29.356.867,50 €	2.166.357,90 €
2012	37.321.397,50 €	36.341.054,60 €	980.342,90 €

Sch. 4.1. – Total remunerations in Micro Companies, SME's and Big Companies and total contributions – €, nominal terms.

Year	T.R - Micro Comp.	Δ	T.R. - SME's	Δ	T.R. - Big Comp.	Δ	Total Contributions	Δ
1990	244197600	-	298259100	-	195865800	-	3618045	-
1991	301421877	23%	359105644	20%	224048228	14%	4266747	18%
1992	325226098	8%	412411978	15%	246298718	10%	4779651	12%
1993	368757630	13%	475773583	15%	258422721	5%	5042592	6%
1994	414730964	12%	515652538	8%	267992134	4%	5345687	6%
1995	418341559	1%	516176423	0%	272290802	2%	6120604	14%
1996	717431058	71%	595482984	15%	262166670	-4%	6112444	0%
1997	770968170	7%	594944075	0%	268984090	3%	6846899	12%
1998	798404325	4%	647726735	9%	303218550	13%	7405208	8%
1999	815371534	2%	680583330	5%	316159892	4%	8030686	8%
2000	743237280	-9%	745020648	9%	339469056	7%	8769254	9%
2001	803711216	8%	795442307	7%	376118215	11%	9570279	9%
2002	895373775	11%	846523000	6%	396285515	5%	10168270	6%
2003	912485313	2%	898952139	6%	431748351	9%	10468759	3%
2004	1217883824	33%	1009174705	12%	485180104	12%	10438570	0%
2005	1308158415	7%	1043434755	3%	505774395	4%	11037321	6%
2006	1354354596	4%	1104270393	6%	547667701	8%	11608054	5%
2007	1444594606	7%	1160025828	5%	597986714	9%	12369715	7%
2008	1537463400	6%	1219529322	5%	668929773	12%	13082141	6%
2009	1541153964	0%	1194435704	-2%	683020520	2%	13131728	0%
2010	1537893229	0%	1200460771	1%	716743932	5%	13483331	3%
2011	1509169855	-2%	1162690605	-3%	708622240	-1%	13746317	2%
2012	1445005666	-4%	1079757556	-7%	684899502	-3%	13082142	-5%
	Σ Anual Δ	207%	Σ Anual Δ	137%	Σ Anual Δ	131%	Σ Anual Δ	135%
	(Σ anual Δ / N°		(Σ Anual Δ / N°		(Σ Anual Δ / N°		(Σ Anual Δ / N°	
	Obs.	9%	Obs.	6%	Obs.	6%	Obs.	6%
	Δ total	492%	Δ total	262%	Δ total	250%	Δ total	262%

Sch. 4.2. – Correlation Matrix. Applied to:

- i) *Absolute values (€) of Contributions (part of current receipts of social security system) - between 1990 and 2012, with application of log function. Represented by **W**.*
- ii) *Absolute values (€) of total of remunerations of Micro Companies - between 1990 and 2012, with application of log function. Represented by **Z**.*
- iii) *Absolute values (€) of total of remunerations of SME's - between 1990 and 2012, with application of log function. Represented by **Y**.*
- iv) *Absolute values (€) of total of remunerations of Big Companies - between 1990 and 2012, with application of log function. Represented by **X**.*

	W	X	Y	Z
W	1.000000	0.958897	0.990651	0.972845
X	0.958897	1.000000	0.957891	0.929470
Y	0.990651	0.957891	1.000000	0.980863
Z	0.972845	0.929470	0.980863	1.000000

Sch. 4.3. – Simple Estimation. Applied to:

- i) *Absolute values (€) of Contributions (part of current receipts of social security system) - between 1990 and 2012, with application of log function. Represented by **W**.*
- ii) *Absolute values (€) of total of remunerations of Micro Companies - between 1990 and 2012, with application of log function. Represented by **Z**.*
- iii) *Absolute values (€) of total of remunerations of SME's - between 1990 and 2012, with application of log function. Represented by **Y**.*
- iv) *Absolute values (€) of total of remunerations of Big Companies - between 1990 and 2012, with application of log function. Represented by **X**.*

Dependent Variable: W Method: Least Squares Date: 08/13/14 Time: 22:51
--

Sample: 1990 2012					
Included observations: 23					
Variable	Coefficient	Std. Error	t-Statistic	Prob.	
X	0.167021	0.127938	1.305488	0.2065	
Y	0.272761	0.157221	1.734885	0.0981	
Z	0.344751	0.079958	4.311646	0.0003	
R-squared	0.972274	Mean dependent var	15.94497		
Adjusted R-squared	0.969501	S.D. dependent var	0.412893		
S.E. of regression	0.072108	Akaike info criterion	-2.300209		
Sum squared resid	0.103990	Schwarz criterion	-2.152101		
Log likelihood	29.45240	Durbin-Watson stat	1.077960		

Sch. 4.4. – Lag Exclusion Test. Applied to:

- i) *Absolute values (€) of Contributions (part of current receipts of social security system) - between 1990 and 2012, with application of log function. Represented by **W**.*
- ii) *Absolute values (€) of total of remunerations of Micro Companies - between 1990 and 2012, with application of log function. Represented by **Z**.*
- iii) *Absolute values (€) of total of remunerations of SME's - between 1990 and 2012, with application of log function. Represented by **Y**.*
- iv) *Absolute values (€) of total of remunerations of Big Companies - between 1990 and 2012, with application of log function. Represented by **X**.*

VAR Lag Order Selection Criteria						
Endogenous variables: W X Y Z						
Exogenous variables: C						
Date: 08/13/14 Time: 23:33						
Sample: 1990 2012						
Included observations: 20						
Lag	LogL	LR	FPE	AIC	SC	HQ
0	58.12450	NA	5.24e-08	-5.412450	-5.213304	-5.373574

1	156.9980	148.3103	1.38e-11	-13.69980	-12.70407	-13.50542
2	166.8290	10.81406	3.23e-11	-13.08290	-11.29058	-12.73302
3	206.6064	27.84417*	6.18e-12*	-15.46064*	-12.87173*	-14.95525*

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

Sch. 4.5. – Impulse Response Function. Applied to:

- i) *Absolute values (€) of Contributions (part of current receipts of social security system) - between 1990 and 2012, with application of log function. Represented by **W**.*
- ii) *Absolute values (€) of total of remunerations of Micro Companies - between 1990 and 2012, with application of log function. Represented by **Z**.*
- iii) *Absolute values (€) of total of remunerations of SME's - between 1990 and 2012, with application of log function. Represented by **Y**.*
- iv) *Absolute values (€) of total of remunerations of Big Companies - between 1990 and 2012, with application of log function. Represented by **X**.*

Period	X	Y	Z
1	0.000000 (0.00000)	0.000000 (0.00000)	0.000000 (0.00000)
2	0.008855 (0.00917)	0.021939 (0.00986)	0.001420 (0.00683)
3	0.013045 (0.01190)	0.027284 (0.01236)	0.005405 (0.00832)
4	0.014761 (0.01611)	0.036236 (0.01698)	0.003109 (0.01099)
5	0.015886 (0.02073)	0.040593 (0.02310)	-0.002600 (0.01398)
6	0.015975 (0.02557)	0.044515 (0.02972)	-0.010073 (0.01672)

7	0.014340 (0.03032)	0.046094 (0.03697)	-0.016236 (0.01950)
8	0.010431 (0.03431)	0.045847 (0.04371)	-0.020008 (0.02213)
9	0.004417 (0.03700)	0.043234 (0.04935)	-0.021404 (0.02460)
10	-0.003023 (0.03807)	0.038465 (0.05307)	-0.021314 (0.02683)
Cholesky			
Ordering:			
W X Y Z			
Standard			
Errors:			
Analytic			

Sch. 4.6. – Variance Decomposition. Applied to:

- i) Absolute values (€) of Contributions (part of current receipts of social security system) - between 1990 and 2012, with application of log function. Represented by **W**.
- ii) Absolute values (€) of total of remunerations of Micro Companies - between 1990 and 2012, with application of log function. Represented by **Z**.
- iii) Absolute values (€) of total of remunerations of SME's - between 1990 and 2012, with application of log function. Represented by **Y**.
- iv) Absolute values (€) of total of remunerations of Big Companies - between 1990 and 2012, with application of log function. Represented by **X**.

Variance Decomposition of W:					
Period	S.E.	W	X	Y	Z
1	0.030409	100.0000	0.000000	0.000000	0.000000
2	0.040754	66.17826	4.721086	28.97918	0.121474
3	0.051760	43.80180	9.279044	45.75336	1.165794

4	0.064964	27.82195	11.05291	60.15614	0.969005
5	0.078294	19.19984	11.72639	68.29639	0.777385
6	0.092076	13.99774	11.48903	72.75444	1.758792
7	0.105270	10.79851	10.64526	74.83207	3.724162
8	0.117065	8.815561	9.402109	75.84976	5.932567
9	0.126750	7.609407	8.141696	76.33669	7.912204
10	0.134265	6.884967	7.306420	76.23745	9.571166

Sch. 4.7. – *Time series obtained after data treatment of the following four time series: “Non-Financial Companies with less than 10 employees in % of the total of non-financial companies: by sector of economic activity”, “Non-Financial Companies with 10 to 249 employees in % of the total of non-financial companies: by sector of economic activity”, “Non-Financial Companies with 250 or more employees in % of the total of non-financial companies: by sector of economic activity” and “Non-Financial Companies: total and by sector of economic activity”.*

Total Non-Financial Companies (in number and year) - A	% Companies with less than 10 workers - B	% Companies with 10 to 249 workers - C	% Companies with more than 250 workers - D
392516 (1990)	91,70%	8,02%	0,28%
389449 (1991)	91,20%	8,48%	0,29%
385348 (1992)	90,70%	9,01%	0,29%
395261 (1993)	90,20%	9,50%	0,28%
393642 (1994)	90,00%	9,72%	0,27%
390662 (1995)	90,20%	9,54%	0,26%
565415 (1996)	93,10%	6,78%	0,14%
545919 (1997)	93,20%	6,70%	0,13%
540217 (1998)	92,90%	6,99%	0,14%
584644 (1999)	93,30%	6,61%	0,13%
589529 (2000)	93,00%	6,92%	0,12%
566066 (2001)	92,60%	7,24%	0,14%
615015 (2002)	92,90%	6,92%	0,13%
639106 (2003)	92,70%	7,19%	0,13%
1084928 (2004)	95,50%	4,60%	0,08%
1121526 (2005)	95,60%	4,31%	0,08%
1143648 (2006)	95,60%	4,36%	0,08%
1206116 (2007)	95,70%	4,21%	0,08%
1235093 (2008)	95,80%	4,12%	0,08%

1198781	(2009)	95,90%	4,05%	0,07%
1144150	(2010)	95,80%	4,20%	0,08%
1112000	(2011)	95,90%	4,05%	0,08%
1062782	(2012)	96,10%	3,85%	0,08%

Nº Companies with less than 10 workers - A*B	Nº Companies with less 10 to 249 workers - A*C	Nº Companies with more than 250 workers - A*D
359937,172	31479,7832	1099,0448
355177,488	33025,2752	1129,4021
349510,636	34719,8548	1117,5092
356525,422	37549,795	1106,7308
354277,8	38262,0024	1062,8334
352377,124	37269,1548	1015,7212
526401,365	38335,137	791,581
508796,508	36576,573	709,6947
501861,593	37761,1683	756,3038
545472,852	38644,9684	760,0372
548261,97	40795,4068	707,4348
524177,116	40983,1784	792,4924
571348,935	42559,038	799,5195
592451,262	45951,7214	830,8378
1036106,24	49906,688	867,9424
1072178,856	48337,7706	897,2208
1093327,488	49863,0528	914,9184
1154253,012	50777,4836	964,8928
1183219,094	50885,8316	988,0744
1149630,979	48550,6305	839,1467
1096095,7	48054,3	915,32
1066408	45036	889,6
1021333,502	40917,107	850,2256

Sch. 4.8. – “Employees in non-financial companies: total and by raking of employees”.

Year	Nº workers in companies	Nº Workers in Com. whith <10	%	Nº Workers in Com. whith >= 10 e <= 249	%	Nº Workers in Com. with => 250	%
1990	2461074	813992	33%	994197	40%	652886	27%
1991	2534601	863673	34%	1028956	41%	641972	25%

1992	2472203	817151	33%	1036211	42%	618841	25%
1993	2489739	832410	33%	1073981	43%	583347	23%
1994	2507061	867638	35%	1078771	43%	560653	22%
1995	2447889	848563	35%	1047011	43%	552314	23%
1996	3017397	1374389	46%	1140772	38%	502235	17%
1997	3055881	1441062	47%	1112045	36%	502774	16%
1998	3096197	1413105	46%	1146419	37%	536670	17%
1999	3092349	1391419	45%	1161405	38%	539522	17%
2000	2986479	1214440	41%	1217354	41%	554688	19%
2001	3043567	1238384	41%	1225643	40%	579535	19%
2002	3121431	1307115	42%	1235800	40%	578519	19%
2003	3154973	1283383	41%	1264349	40%	607241	19%
2004	3670147	1648016	45%	1365595	37%	656536	18%
2005	3735121	1710011	46%	1363967	37%	661143	18%
2006	3819940	1720908	45%	1403139	37%	695893	18%
2007	3973458	1792301	45%	1439238	36%	741919	19%
2008	4063965	1823800	45%	1446654	36%	793511	20%
2009	3938491	1775523	45%	1376078	35%	786890	20%
2010	3843268	1710671	45%	1335329	35%	797268	21%
2011	3735340	1667591	45%	1284741	34%	783008	21%
2012	3511666	1580969	45%	1181354	34%	749343	21%

Sch. 4.9. – Time series obtained after data treatment of “Average monthly wage of employees: base pay and gain” (sch. 2.2.) and the time series of sch. 4.8. – Nominal Terms.

Year	Average Remuneration - A	Nº					
		Nº Workers Micro Comp. -		Workers Micro Comp. -		Nº Workers Big Comp. -	
		B	B*A	SME's - C	SME's - A*C	D	A*D
1990	300	813992	244197600	994197	298259100	652886	195865800
1991	349	863673	301421877	1028956	359105644	641972	224048228
1992	398	817151	325226098	1036211	412411978	618841	246298718
1993	443	832410	368757630	1073981	475773583	583347	258422721
1994	478	867638	414730964	1078771	515652538	560653	267992134
1995	493	848563	418341559	1047011	516176423	552314	272290802
1996	522	1374389	717431058	1140772	595482984	502235	262166670

1997	535	1441062	770968170	1112045	594944075	502774	268984090
1998	565	1413105	798404325	1146419	647726735	536670	303218550
1999	586	1391419	815371534	1161405	680583330	539522	316159892
2000	612	1214440	743237280	1217354	745020648	554688	339469056
2001	649	1238384	803711216	1225643	795442307	579535	376118215
2002	685	1307115	895373775	1235800	846523000	578519	396285515
2003	711	1283383	912485313	1264349	898952139	607241	431748351
2004	739	1648016	1217883824	1365595	1009174705	656536	485180104
2005	765	1710011	1308158415	1363967	1043434755	661143	505774395
2006	787	1720908	1354354596	1403139	1104270393	695893	547667701
2007	806	1792301	1444594606	1439238	1160025828	741919	597986714
2008	843	1823800	1537463400	1446654	1219529322	793511	668929773
2009	868	1775523	1541153964	1376078	1194435704	786890	683020520
2010	899	1710671	1537893229	1335329	1200460771	797268	716743932
2011	905	1667591	1509169855	1284741	1162690605	783008	708622240
2012	914	1580969	1445005666	1181354	1079757556	749343	684899502