DOCUMENTS DE TREBALL
DE LA FACULTAT DE CIÈNCIES
ECONÒMIQUES I EMPRESARIALS

Col·lecció d'Economia

E08/195

Top income shares in Portugal over the twentieth century*

Jordi Guilera Rafecas

Adreça correspondència:
Departament d'Història i Institucions Econòmiques
Facultat de Ciències Econòmiques i Empresarials
Universitat de Barcelona. Avda. Diagonal, 690
08034 Barcelona (Spain)
e-mail: jguilera@ub.edu

* I would like to thank Alfonso Herranz for his continuous support and stimulus. I am also grateful to all the participants in both the XXVII APHES congress, held in Lisbon, and the Barcelona Workshop on Economic Inequality and the Origins of the Welfare State in Spain and Portugal for their insightful comments, especially Natalia Mora-Sitja. This research has also benefited from a research stay in the Instituto da Ciências Sociais (ICS) of Lisbon under the supervision of Pedro Lains. Finally, this research would not have been possible without the financial support of the Industrial and Business History research group (UB) and the Globalization, Economic Inequality and Public Policies in Historical Perspective research group of the R+D+I Reference Network in Economics and Public Policies of the Generalitat de Catalunya.

Abstract: This paper presents new statistical evidence on the long-term evolution of income inequality in Portugal. Portuguese tax sources have been employed to estimate top income shares from 1936 onwards, with the methodology used to derive such inequality measure being taken from Piketty (2001). The new series show a decrease in top income shares during WWII, followed by a recovery up until the early 1950s. From the mid-fifties to the early eighties there was a huge decline in top income shares. Finally, during the 1990s top income shares once again increased. This pattern is very similar to the experience of other countries: the decline of top income shares during the "Golden Age" has been observed in most other cases, and their increase during the 1990s seems to put Portugal on a par with the experience of Anglo-Saxon countries.
JEL Classification: D31, O15, H24
Keywords: Top incomes, Portugal, economic inequality

Resum: L'objectiu d'aquest article és presentar nova evidència estadística sobre l'evolució de les desigualtats econòmiques a Portugal a llarg termini. L'explotació de les fonts fiscals portugueses ha permès l'estimació anual de les top income shares des de 1936. La construcció d'aquesta nova sèrie s'ha fet seguint la metodologia emprada per Piketty (2001). Aquesta nova sèrie revela una caiguda de les top income shares durant la Segona Guerra Mundial, seguida d'una recuperació fins a principis dels anys cinquanta. Des de mitjans dels cinquanta fins a principis dels anys vuitanta hi ha una caiguda dràstica de les top income shares. Per acabar, durant els anys noranta les top income shares tornen a augmentar. Aquesta pauta és molt similar a la viscuda en altres països: la reducció de les top income shares durant l'època daurada és compartida per tots els països estudiats i el seu increment als anys noranta sembla que alinea Portugal amb la pauta seguida pels països Anglosaxons.

1. Introduction

This paper presents new statistical evidence about the long-term evolution of income inequality in Portugal. The issue of economic inequality has become one of the main concerns in economics, and economic historians have made important contributions to this field in several directions: providing long term series to contextualize present distributions, developing new theories that relate the evolution of inequality to other macroeconomic magnitudes, and explaining the causes of existing inequality trends. Thus, having been overlooked for a number of decades the issue of inequality is once again receiving due attention[1] and is now regarded as an important aspect within mainstream economics.

The growing literature on income inequality has also benefited from the emergence of new methods and approaches. One of these is the use of tax return statistics to derive inequality measures that cover only the richest percentiles of the population. Although this methodology was first developed by Kuznets (1953), it was subsequently reformulated by Piketty (2001) and several recent studies have applied it to the situation of different countries.[2] One of the shortcomings of these kinds of studies is that they only focus on the very rich, paying no attention to the rest of the

[1] Anthony Atkinson, in his presidential speech to the Royal Economic Society entitled *Bringing income distribution in from the cold*, said that: "the title of this presidential address is chosen to highlight the way in which the subject of income distribution has in the past been marginalized. For much of this century, it has been very much out in the cold. There are signs that in the 1990s it is being welcomed back (…). I would like to use this occasion to give further impetus to the re-incorporation of income distribution into the main body of economic analysis." Atkinson (1997), p. 297

[2] Alvaredo and Saez (2006) for Spain; Atkinson (2005) for the UK; Atkinson and Leigh (2005) for New Zealand; Atkinson and Leigh (2007) for Australia; Atkinson and Salverda (2003) for the Netherlands; Banerjee and Piketty (2005) for India; Dell (2005) for Germany and Switzerland; Leigh and van der Eng (2007) for Indonesia; Nolan (2007) for Ireland; Piketty (2003) for France; Piketty and Saez (2001) for the United States; Roine and Waldenström (2006) for Sweden; and Saez and Veall (2005) for Canada.

population. However, a reduction in top income shares may go hand in hand with increased inequality as measured with broader and more complete measures. In this regard, Leigh (2007) unified the information available for different countries and tested its credibility. He found there to be a high correlation between top income shares (P90 and P99) and more complete measures such as the Gini coefficient reported in different databases (Deininger and Squire, 1996; World Income Inequality Database and Luxembourg Income Study). This finding suggests that top income shares may be a good proxy of inequality and can be used where other measures are of low quality or when there is no alternative information, a situation which is quite frequent when we shift our attention from the present.[3]

This paper shows the evolution of top income shares in Portugal from 1936 to 1999. As such, it may help to expand the available international database and also provide a better understanding of inequality in Portugal, which is today one of the most unequal countries within the EU[4]. In addition, the new series may provide a historical context in which to situate the recent negative evolution of Portuguese inequality, and might also reveal some of the reasons for it.

These new series are the first attempt to describe the evolution of income inequality in Portugal during the twentieth century. Silva and Santos (1980) had previously used Portuguese tax statistics to estimate inequality measures. More specifically, they estimated the level of inequality in 1977 for each Portuguese *distrito* and *concelho*. However, the present paper represents the first long-term analysis of Portuguese tax statistics.

[3] However, Lindert, Milanovic and Williamson (2007) state that this has not always been true, at least for the pre-industrial period, when top income shares appeared to be a bad proxy for global income inequality.
[4] Rodrigues (1999)

The remainder of this paper is structured as follows: Section 2 presents the data and methodology used; Section 3 shows the main results and tries to account for the causes behind the main trends; Section 4 puts the Portuguese experience in historical context, and Section 5 offers some conclusions.

2. Data and methodology

The methodology used to derive top income shares is based on the pioneering paper by Piketty (2001) and involves estimating the income shares of the richest fractiles of the population. Information on individual incomes comes from tax return statistics structured into different income brackets. To obtain the different top income shares, the number of tax units and their incomes are divided by the total reference population and the total reference income, respectively. The estimation of income threshold and the income belonging to each fractile are calculated by assuming that incomes are distributed according to a Pareto function.

The regulation of personal income tax in Portugal has undergone a significant transformation since the first attempt to introduce it, in the context of the 1922 failed fiscal reform. The ambition and complexity of the reform, the prevailing administrative weakness, government instability and tax evasion are some of the factors that may explain the complete failure to implement it. In 1929, a commission headed by Antonio de Oliveira Salazar designed a new fiscal reform aimed at producing a simpler system, one that was more likely to be applied. The main concern of the

reformers was to increase public revenues in order to be able to balance the government budget, which had been out of control since World War I.[5]

The new fiscal system did not imply a complete change with respect to the previous one and was characterized by the existence of several taxes in specific fields. These different taxes were applicable to the "normal" or presumed returns of taxpayers, and not the actual figures, as in modern fiscal systems. The sum of all the returns assessed by the specific taxes was then burdened again by the *contribuiçao complementar* (complementary tax) with progressive rates. More specifically, the returns taxed by the *contribuiçao complementar* were the sum of the assessed returns in the *contribuiçao predial* (land tax), *imposto sobre a industria agrícola* (agricultural industry tax), *contribuiçao industrial* (industrial tax), *imposto profissional* (professional tax) and *imposto sobre a aplicaçao de capitais* (capital tax). The *contribuiçao complementar* had two sections: section A for individuals and section B for entities. The replacement of the *imposto pessoal* (the failed personal tax established in the 1922 reform) by the *contribuiçao complementar* was a step backwards in terms of modernizing the design of the Portuguese fiscal system, but it had two positive features: it introduced a 'soft personalization' and, most importantly, it was fully applied.

This system remained effective until the 1958-65 fiscal reform, which introduced real income assessment and left behind the "normal" or presumed income tax system. Nevertheless, it maintained the prevailing fiscal structure, that is to say, separate taxes for different kinds of incomes and a superposed tax over them all: the *contribuiçao complementar*. This reform was drawn up by a commission headed by Teixeira Ribeiro, who some years later denounced the move away from the principles established

[5] Leitao (1997). Although monetary stability was first achieved in 1924, during the Republican period, the years immediately after the 1926 military coup saw the financial situation get substantially worse (Valerio, 1994)

in the reform, such as the return determination system, which in some cases ended up being characterized again by the "normal" or presumed income assessment[6].

The new constitution approved in 1976 set out the principles that should characterize the Portuguese fiscal system under the new democracy. However, although these principles contradicted the existing tax structure, the necessary fiscal reform was not implemented until 1988. This reform was guided by three principles: equity, efficiency and simplicity. The previous system was completely abandoned. The taxation of personal incomes became entirely covered by one single tax: the *imposto sobre o rendimento das pessoas singulares* (IRS). The IRS is direct, personal and based on real returns assessment. This latter reform allowed Portugal to join the group of countries with a modern fiscal system.

As regards tax rates, these have always been progressive, although they have changed significantly since personal income tax was established. The tax rate structure evolved in two different directions. On the one hand, whereas during the first decade there were almost 200 marginal tax rates, their number gradually decreased to between four and five during the 1990s. On the other hand, the top marginal tax rate increased rapidly after the mid-forties. It was 4.97% until 1945 and then rose to 30% between 1946 and 1963. Between 1964 and 1975 it was 45% and then reached 80% between 1976 and 1981, after the *Revoluçao dos cravos*, during the period in which the extreme left ruled the political power. Finally, since 1989 it has been fixed at 40%. The second process (increasing top marginal tax rate) was clearly more intense than the first one (decreasing number of marginal tax rates) and, as a consequence, Portuguese personal tax has become more progressive since its introduction.[7]

[6] Ribeiro (1968).
[7] Portuguese tax rates are shown in tables A1.1-A1.6 of Appendix 1.

The establishment of income tax has been a slow and progressive phenomenon in most countries over the twentieth century. At first, it usually covered a small fraction of the total population, which then increased afterwards. In this regard the Portuguese experience is no exception. As is shown in Table 1 the population covered by income tax increased from 1936 to 1945, then fell (from 2.91% to 0.39%), and from then on increased continuously, reaching 68.3% in 2000. This coverage level has allowed the yearly estimation of the top 0.5% of income shares for the whole period under study. In contrast, the top 1% of shares shows a discontinuity between 1946 and 1956, and the top 5% and 10% can only be calculated from 1976 onwards, when tax coverage increased significantly.

Table 1 – Tax coverage

1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951	
1.4%	1.5%	1.5%	1.6%	1.7%	1.8%	1.9%	2.1%	2.2%	2.9%	0.3%	0.4%	0.5%	0.5%		0.7%	
1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	
0.7%	0.8%	0.8%	0.8%	1.0%	1.0%	1.1%	1.0%	0.9%	0.9%	1.0%	1.2%	0.8%	1.3%	1.3%	1.5%	
1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	
1.7%	1.9%	2.2%	2.5%	3.0%	3.5%	4.1%	3.5%	18.2%	14.7%		17.9%	21.0%	27.6%			
1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
					46.6%	57.0%	57.0%	59.0%	57.0%	59.4%	58.1%	60.4%	62.8%	63.7%	64.9%	68.3%

Source: Portuguese tax statistics and population censuses.

As for tax regulation and coverage, the statistical information published by the Portuguese Ministry of Finance also varied across time. In order to estimate top income shares, the best possible statistical information would be the total returns assessed for each tax unit, distributed among different income brackets. Unfortunately, this information is not available throughout the whole period studied, and a number of adjustments have been necessary in order to obtain a homogeneous series.

From 1936 to 1945, there is information on the number of tax units, classified among different brackets according to the taxes paid. In order to get top income shares, it has been necessary, first, to classify the information according to the total incomes assessed by each tax unit rather than to the taxes paid. This has been possible by dividing each bracket threshold by its corresponding tax rate[8]. The second step involves estimating the amount of returns assessed in each bracket. This has been done by assuming that returns are Pareto distributed.

A Pareto distribution has the following distributional function:

$$F(y) = 1 - (k / y)^{\alpha} \tag{1}$$

where $y > k$, k is the minimum income from which y is defined and α is a positive parameter.

In order to estimate the total incomes pertaining to each bracket the parameters k and α have to be estimated. It is known that

$$p = (k / s)^{\alpha} \tag{2}$$

and

$$q = (k / t)^{\alpha} \tag{3}$$

where p and q are the fraction of taxpayers above the bracket thresholds s and t, s<t.

Solving (2) and (3) the parameters k and α can be estimated:

[8] Tax rates are published in Tavarés (1942).

$$k = s \cdot p^{(1/\alpha)} \tag{4}$$

$$\alpha = \frac{\ln(p/q)}{\ln(t/s)} \tag{5}$$

Once the two parameters α and k are known for each income bracket, and by means of the density function:

$$f(y) = \frac{\alpha \cdot y_0^{\alpha}}{y^{\alpha+1}} \tag{6}$$

the total income pertaining to each income bracket can be estimated with the following equation:

$$Y_i = N \cdot \int_s^t y \cdot \frac{\alpha \cdot k^{\alpha}}{y^{1-\alpha}} dy \tag{7}$$

where N is the total number of taxpayers and Y_i is the total income of each income bracket.[9]

From 1946 to 1963 the statistics published by the Ministry of Finance about the *contribuiçao complementar* give information on the total incomes of all tax units, classified in different income brackets. In addition, for each bracket there is information about the number of tax units and their total incomes. This is the information needed for the construction of the series, so no adjustment is necessary.

From 1964 to 1981, the statistics published have the same structure, but the concept of income is now taxable income, i.e. total income less

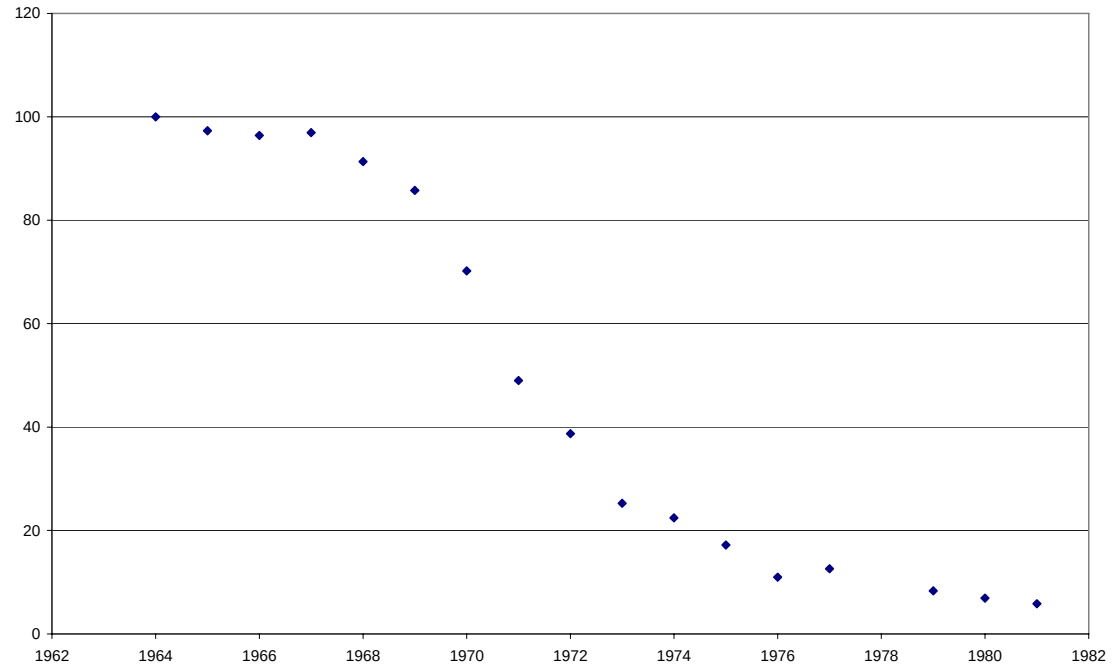
[9] This is the standard Pareto interpolation method used by Kuznets (1953) and Feenberg and Poterba (1993); see Alvaredo and Saez (2007), p. 40.

deductions. There were six kinds of deductions regulated by articles 3, 28, 29, 30, 84 and 91 of the complementary tax code. Of these, 68% of deductions were due to article 29 and associated with family circumstances (a personal deduction, a deduction per partner and per number of children). A further 27% of deductions were due to article 28 and associated with different circumstances[10]. The remaining articles were of minor importance and only accounted for 5% of total deductions. There is, however, no clear way of knowing how the deductions were distributed among tax units. Were they regressive or progressive? The description of deductions in the tax code is too generalist to enable any inferences to be made about the most appropriate way to add deductions to taxable income. Here, it has been assumed that they were distributed in the same way as prior to 1963, when there is information on both total income and taxable income distributed among different brackets.[11]

It should be highlighted that the quantitative importance of deductions in real terms (i.e. as a percentage of PSI) decreased over time, as is shown in Figure 1. This means that any potential distortions associated with the allocation of deductions are concentrated in the period before the early seventies, when deductions were quantitatively relevant.

[10] These were taxes paid for the different specific taxes, social contributions paid by workers, interests and debt obligations, pensions paid by taxpayers and half of the remunerations received by wage-earners.
[11] Appendix 2 gives a detailed explanation of the method used to allocate deductions.

Figure 1 - (Total deductions/number of tax units)/PSI. 1964=100



Source: Based on Portuguese tax statistics and Pinheiro (1997)

Between 1982 and 1988, statistical information is too aggregate, and does not classify the information in different brackets. This prevents an estimate of top income shares being made for most of the eighties. Finally, from 1989 onwards, the official statistics give the same information as between 1946 and 1963. Again, no adjustment is necessary.

The number of income brackets in which tax statistics are classified also varied across time.[12] Up until 1945 there were nine income brackets, while between 1945 and 1963 their number rose to 31. Between 1964 and 1976 they decreased again to sixteen, falling further to twelve in the period up to 1979 and to eleven up to 1981. During the last period, from 1989 onwards, the number of income brackets was fixed at twenty. In general, although more brackets enable better estimations (less dependent on the

[12] The evolution of the income brackets structure is shown in Table A1.7 of Appendix 1.

Pareto assumptions), the number of income brackets over this period seems to have been sufficient to guarantee the robustness of the estimations.

Once a homogeneous series for the total income of taxpayers, distributed in different brackets according to their income, has been obtained the income shares of the top fractiles (P90, P95, P99, P99.5, P99.9, P99.95 and P99.99, equivalent to the top 10%, top 5%, top 1%, etc.) can be estimated.[13] To this end, the first step involved defining the number of tax units that formed the top fractiles. The unit of taxation of Portuguese income tax is a married couple or a single individual. In order to estimate the total reference population, the number of married women has been subtracted from the total population aged 20 or over. This information has been taken from Portuguese population censuses, which were published decennially during the period under study. The values between census years have been obtained through linear interpolation.

Secondly, the income threshold of each fractile (i.e. the income of the first tax unit of each fractile) has been estimated by applying the following equation:

$$y_t = \frac{k}{p^{1/\alpha}} \tag{8}$$

where y_t is the income threshold.

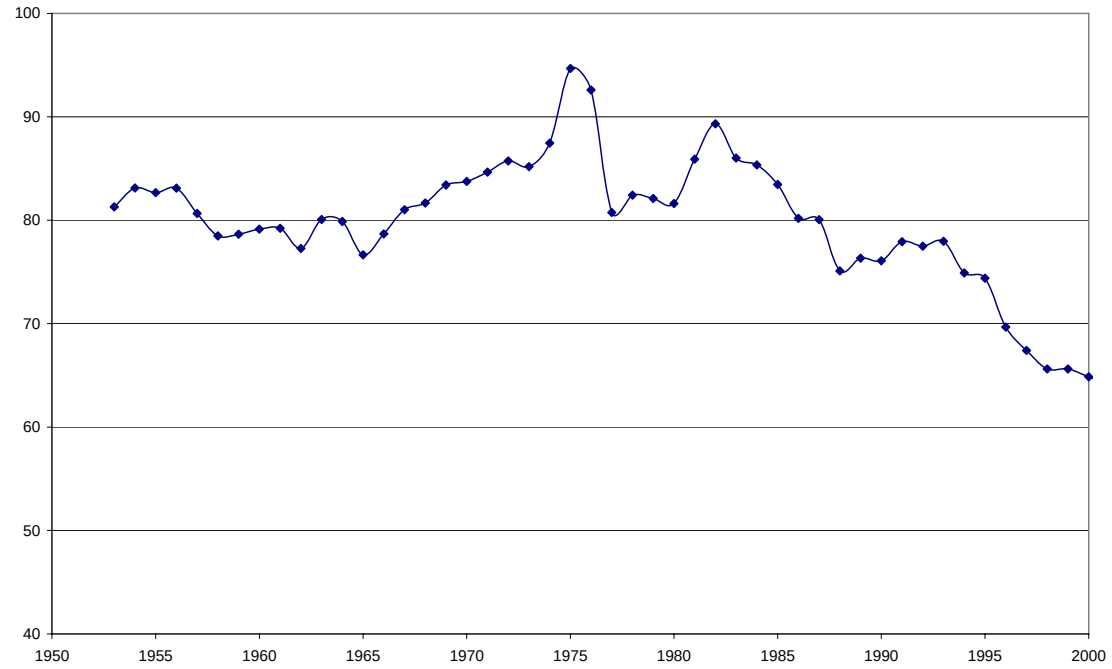
Thirdly, the total income between the y_t and the upper bracket boundary has been estimated by integrating equation (7) between y_t and t (the upper bracket threshold). The result has then been added to the amount of income above t (published in the statistics). Finally, the total value obtained has been divided by the total reference income.

[13] The estimation of the intermediate fractiles has been calculated as the difference between the top fractiles, i.e. P90-95 = P90-P95.

The total reference income should have been obtained from national accounts, by subtracting from the personal sector income (PSI) those concepts that are not burdened by income tax. In the case of Portugal, the information needed to do these kinds of adjustment is not available for the whole period under study and, therefore, it has been necessary to take the PSI[14] as the total reference income. PSI figures come, for 1953-1994, from Pinheiro (1997) and, from 1995 onwards, from the national accounts published online by the INE (National Statistics Institute). Before 1953, PSI figures are not available and it has therefore been assumed that between 1936 and 1952 the average PSI/GDP ratio was the same as in the period 1953-62. This is a reasonable assumption because the PSI/GDP ratio was fairly constant. Up until the mid-eighties (with the exception of the transition-to-democracy period) it always took a value around 80%. Only after the mid-eighties did this ratio began to decline (see Figure 2). Thus, GDP data from Batista et al. (1997) have been used to estimate yearly figures of PSI between 1936 and 1953, and a continuous series has been obtained by equalizing the values of PSI in the years in which there is a change of source (1953 and 1995), and by rescaling the series for the previous years.

[14] Rendimento bruto disponible das famlias e administraçoes privadas.

Figure 2 - Ratio PSI/GDP



Sources: Based on Pinheiro (1997) and online INE statistics

In several years there are some data missing for some top income shares. In these cases, the criteria established by Leigh (2007)[15] are adopted, i.e. the missing data are linearly interpolated if the missing years are four or fewer.[16]

The final series have some discontinuities that should be mentioned. Firstly, from 1945 to 1946 the characteristics of the statistical information published changed, as described above. However, the adjustments introduced in the estimation have minimized any potential distortions due to this change, and the different series estimated are fairly stable. Secondly, between 1963 and 1964, the fiscal system was redesigned. As a consequence, between 1963 and 1965 there is a short but intense increase in the top income shares that may be attributable to regulation changes in

[15] Leigh (2007), p. 10.

[16] This has been the case in: (1) 1978 for all top income shares; (2) 1959-61 and 1964 for the top 1%; and (3) 1946-48 for the top 0.05%. Between 1982 and 1988 data are also missing, but they have not been linearly interpolated due to the size of the gap.

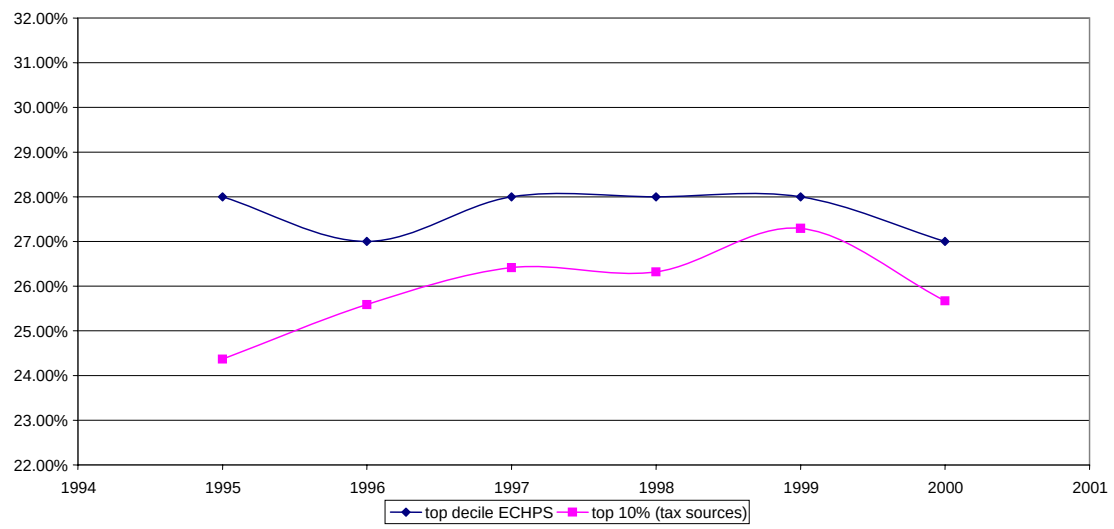
the income tax. This increase in the top income shares means that all comparisons between the level of the series before and after 1963 must be treated with caution, and may also indicate that the series are biased downwards before 1963. Finally, between 1982 and 1988 there is a gap in the series and the major changes in tax regulation codes prevent any comparison between top income shares in 1981 and 1989. In sum, there are two significant discontinuities in the series (1963 and 1982-88) which must be kept in mind when analysing the levels of top income shares (although they do not necessarily affect the analysis of the main trends).

The robustness of the estimates is difficult to check because there are few alternative inequality indicators for Portugal. The international databases provided by Deininger and Squire (1996) and the World Income Inequality Database (WIID) report two kind of sources: the Household Income and Expenditure Survey (HIES) for 1973, 1980 and 1990 and the *European Community Household Panel Survey* (ECHPS), which gives annual information from 1995 onwards. The first source reveals a decrease of the Gini[17] index from 1973 to 1980, which goes in the same direction as the index presented here. As for the top decile share, the estimates in this paper are quite similar to those reported by the ECHPS for the 1990s, as may be observed in Figure 3. In contrast, for 1980 the estimate of the top decile share presented here seems to be clearly understated (12.5% vs. 26% in the HIES). In fact, it is not necessary to compare the top income shares of the 1980s with other sources to realize that they are understated: the top decile income share in 1981 is only slightly above 10%, which is completely unlikely. If the value for 1980 (the first with an alternative inequality measure) is understated, it is reasonable to assume that the share is also downward biased for the previous years. It has to be stressed,

[17] The inequality measures used are based on the definition of disposable income.

therefore, that the main value of the estimates presented in this paper lies in the analysis of inequality trends, but not in the top income share levels.

Figure 3 - Top decile income shares (1995-2000)



Source: Present author using ECHPS and Portuguese tax statistics

3. The facts

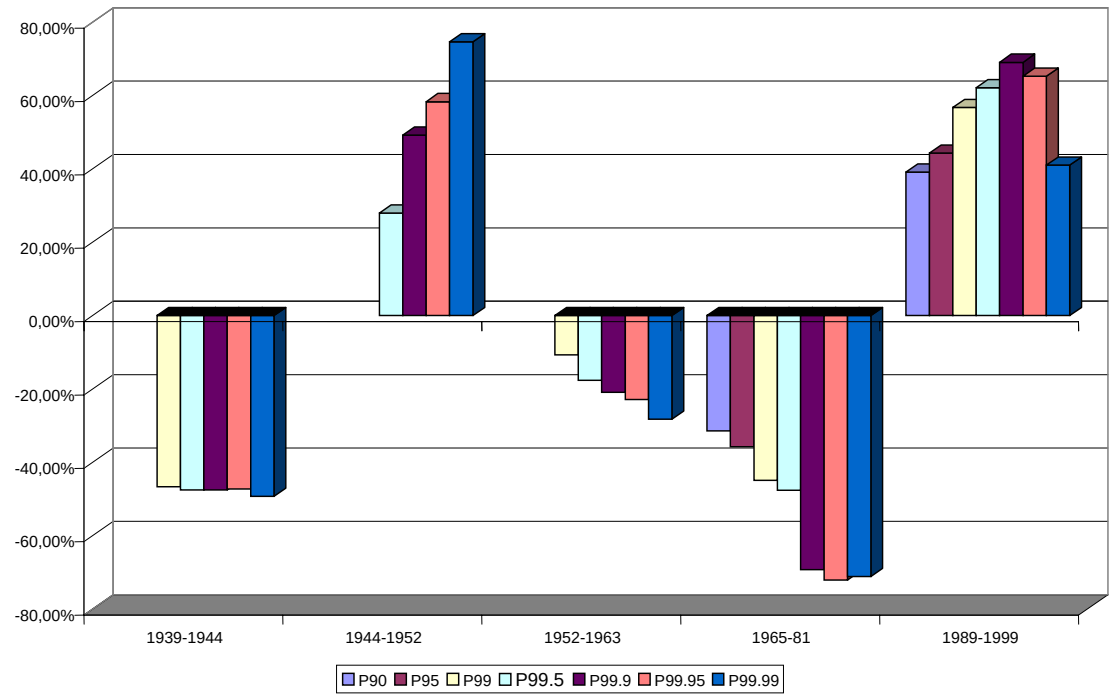
Three different periods can be distinguished in the evolution of top income shares in Portugal. The first seems to be related to the shock of the Second World War. Although Portugal was a neutral country during the war, the conflict may have eroded top income shares up until 1945. Afterwards, the situation changed and by the early fifties top income shares had recovered their pre-war values. The second period was characterized by a significant decrease in top income shares. After a decade of relative stability a sharp decline of top income shares began in the late 1950s,

which lasted until 1981. Finally, the third period, from 1989 onwards, was again characterized by an increase in top income shares.

As can be seen in Figure 4, top income shares fell by 50% between 1939 and 1944. This decrease was quite similar for all the fractiles for which information is available (top 1% and above). The recovery of top income shares after World War II also affected all fractiles, but this was more intense for those located at the end of the income distribution. This implied increased inequality not only between the very rich and the rest of the population but also a wider dispersion within the richest 1%. Later on, from the early fifties to the early eighties, top income shares declined considerably. The decrease between 1952 and 1982 was higher for those fractiles located at the end of income distribution, i.e. there was a process of income convergence among the richest 1%[18]. The lack of statistical data makes it impossible to discern what happened between 1981 and 1989, but, after this parenthesis, top income shares increased again between 1989 and 1999.

[18] This last conclusion does not involve the top 5% and 10% of shares because they are only available from 1976 onwards.

Figure 4 - Changes in top income shares

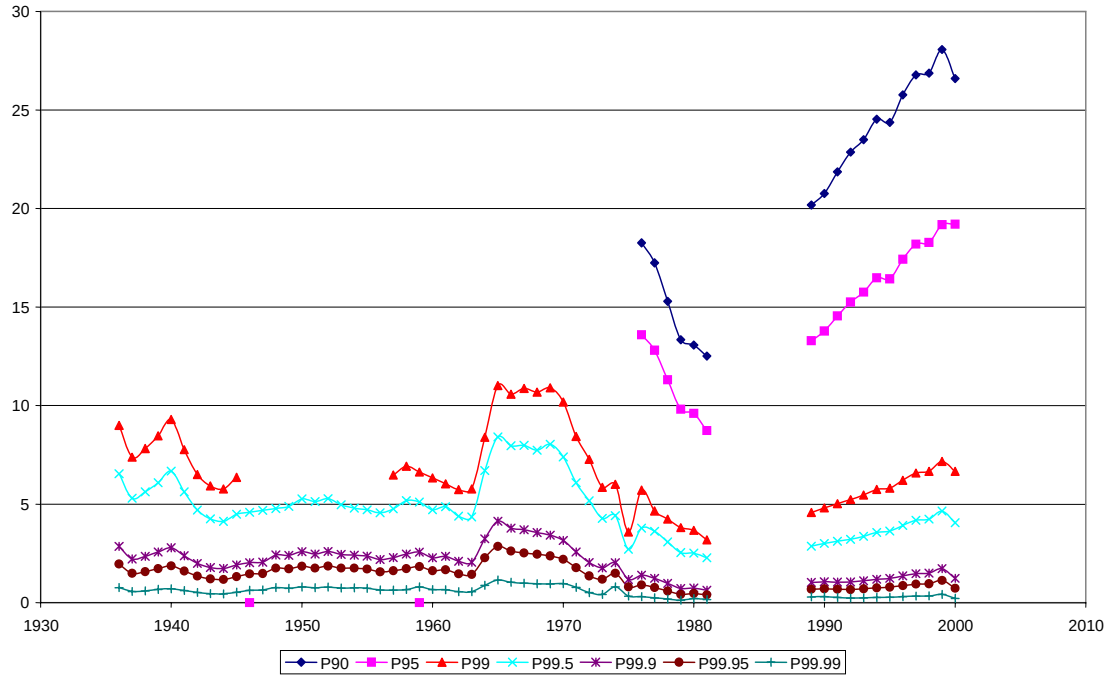


Source: Based on Portuguese tax statistics and population censuses

Figures 5, 6, and 7 show the evolution of top income shares from 1936 onwards. Once the shock of the Second World War was overcome, what emerges from the different figures is the huge decline in top income shares that took place from the late fifties onwards. In the last part of the period studied, from 1989 onwards, top income shares gradually increased. The shares of the top 0.01%, 0.05%, 0.1%, 0.5%, 1%, 5% and 10% increased from 0.30%, 0.68%, 1.02%, 2.87%, 4.57%, 13.29% and 20.18% in 1989 to 0.42%, 1.13%, 1.73%, 4.65%, 7.17%, 19.18% and 28.07% in 1999.[19]

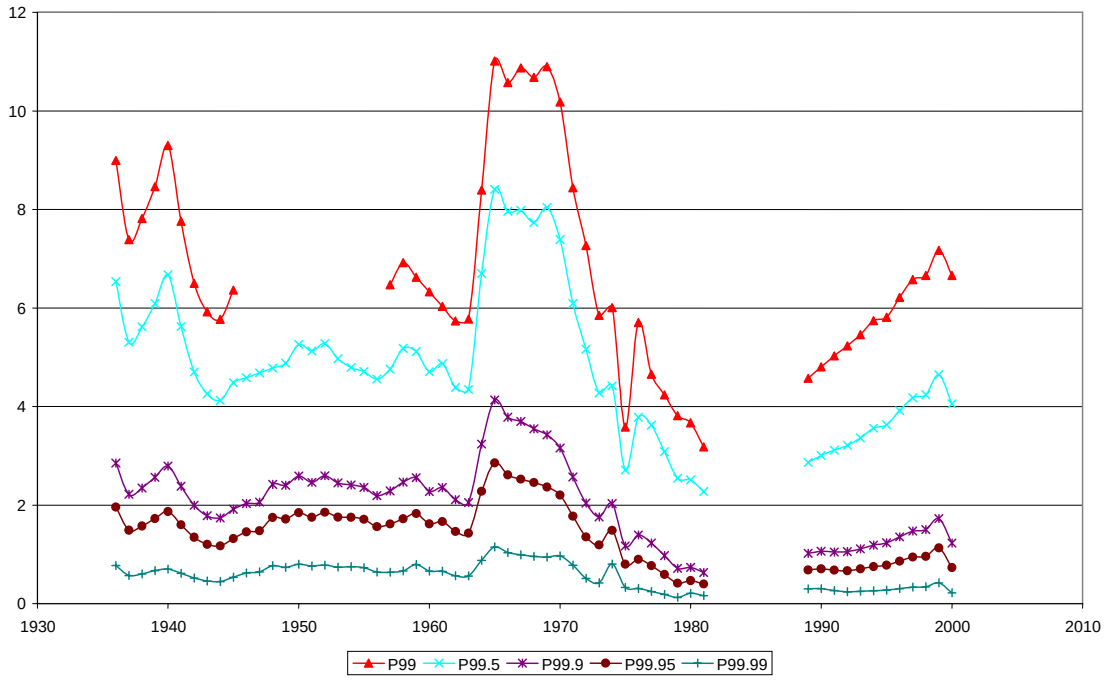
[19] Unlike previous periods, the estimated levels are trustworthy in the last decade of the twentieth century for two different reasons: first, they are based on a more reliable source, and second, they show similar outcomes to other sources such as household budget surveys.

Figure 5 - Top income shares (1936-1999)



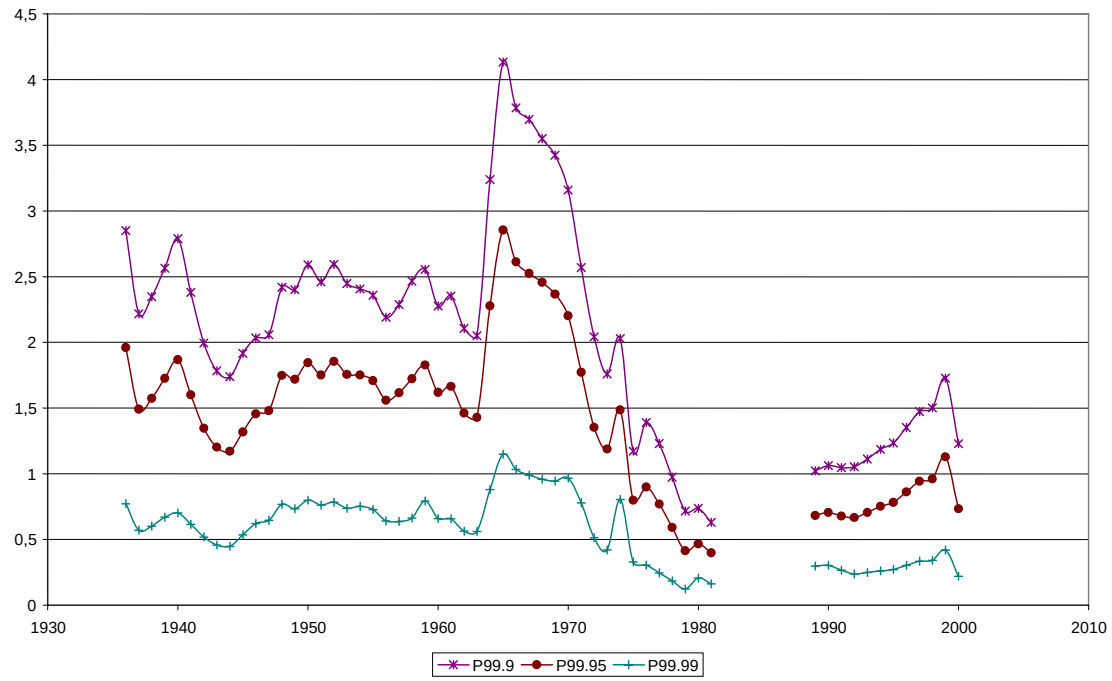
Source: Based on Portuguese tax statistics and population censuses

Figure 6 - Top income shares (1936-1999)



Source: Based on Portuguese tax statistics and population censuses

Figure 7 - Top income shares (1936-1999)



Source: Based on Portuguese tax statistics and population censuses

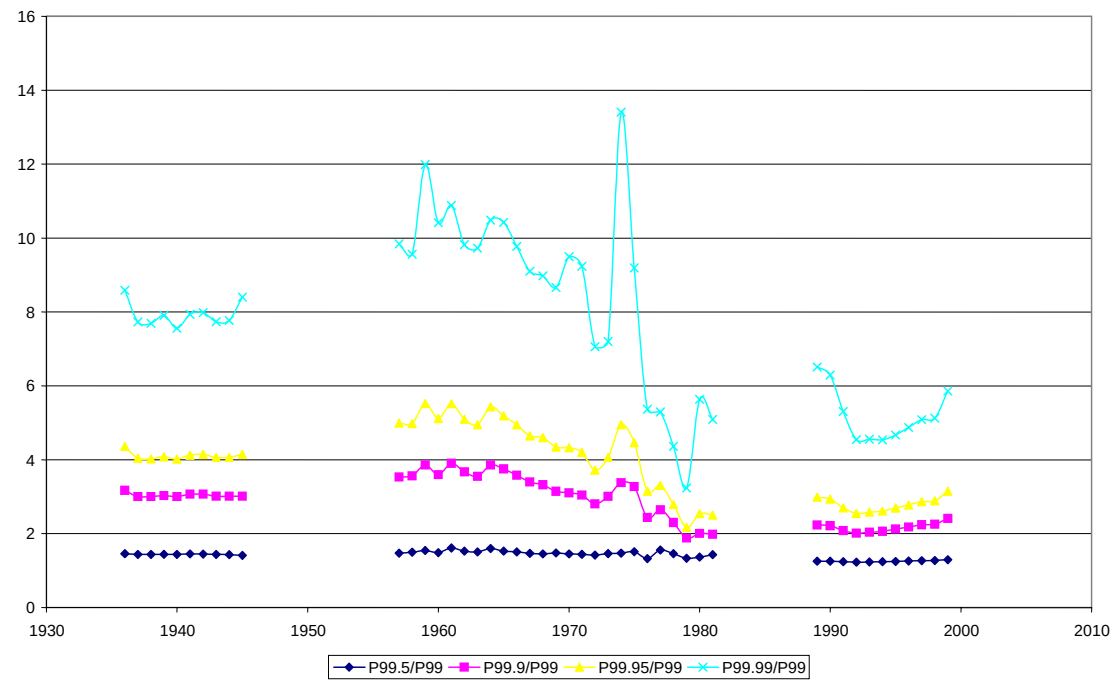
Figure 8 shows different ratios that reveal how many times richer (on average) were tax units from the upper percentile of each ratio than were tax units from the lower one. The top 1% is taken as a reference because it is the largest share for which information is available for almost all years[20]. An increase in the different ratios would indicate an increasing dispersion among the very rich and vice versa. As can be seen in this figure, the different ratios evolve in the same direction. There is relative stability until the mid-forties, while from then on to the late fifties there seems to be a process of slight divergence; however, data for this period are not complete and it is only possible to compare 1945 with 1957. From the early sixties to the late seventies there is a significant convergence process, while from

[20] The ratio P99.99/P99 has been calculated with the following equation:

$$\frac{P99.99}{P99} = \frac{top0.01\%incomeshare/0.0001}{top1\%incomeshare/0.01}$$

1989 onwards there seem to be short-term oscillations with no definite trend. The ratio P99.99/P99 is perhaps the most appropriate for characterizing the dispersion between the very rich. Up until the mid-forties the top 0.01% was around eight times richer than the top 1%, and in 1959 this ratio peaked at almost 12. From then onwards it began to fall dramatically and in 1979 the top 0.01% were only 3.1 times richer than the top 1%. Nevertheless, it was in 1974 that this ratio reached its historical maximum (13.4), during a short but intense rise-and-fall movement that could be related to the major political changes that occurred in that year. In 1989 the ratio was 6.5, fell to 4.5 in 1992 and increased again to 5.9 in 1999.

Figure 8 - Percentiles ratios

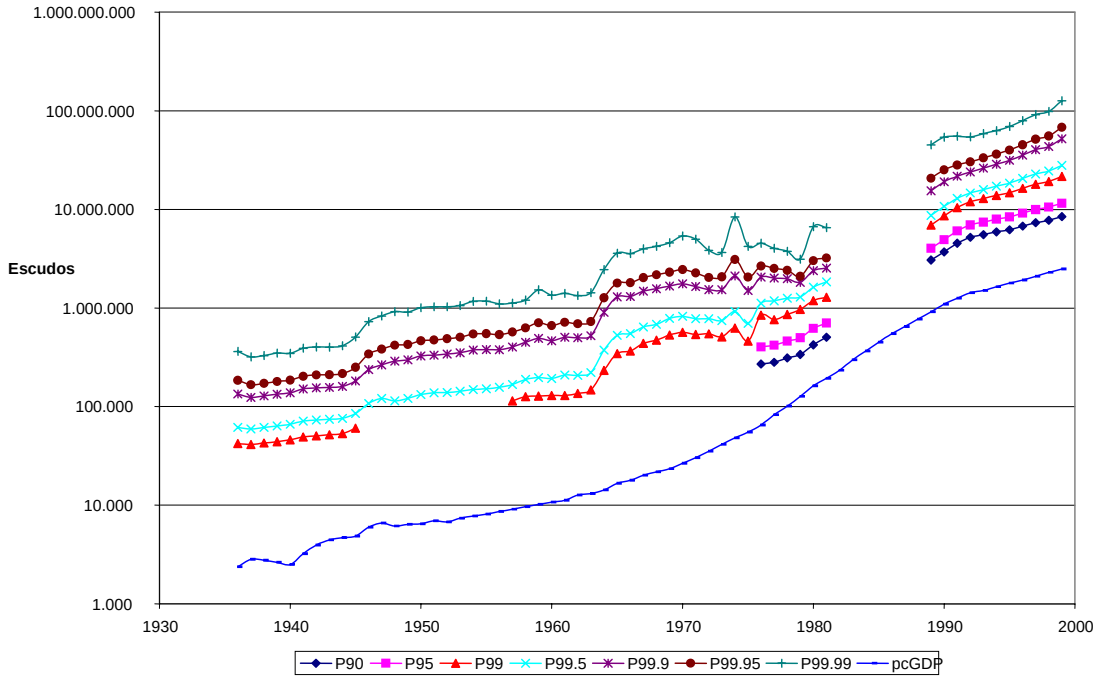


Source: Based on Portuguese tax statistics and population censuses

Another perspective on the evolution of Portuguese top income groups is shown in Figure 9, where the average incomes of the different top

income groups are compared with pcGDP. As can be seen, average incomes of the richest percentiles were growing throughout the period studied and followed a stable pattern. However, despite this favourable evolution, their incomes converged with the evolution of pcGDP, mostly during the "Golden Age". Thus, it could be concluded that the declining top income shares of the very rich from the early fifties to the early eighties reflected, in fact, a worsening relative situation that should not obscure their improvement in absolute terms.

Figure 9 – Average income of top percentiles and pcGDP



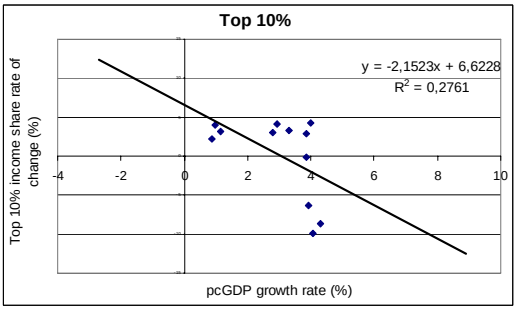
Source: Based on Portuguese tax statistics, population censuses, Batista et al. (1997), Pinheiro (1997) and online INE statistics

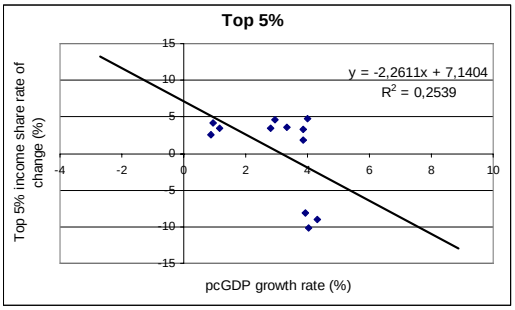
In sum, the picture that emerges from the observation of the different figures is a short-term oscillation of top income shares coinciding with WWII, a decline from the early fifties, which may have accelerated from

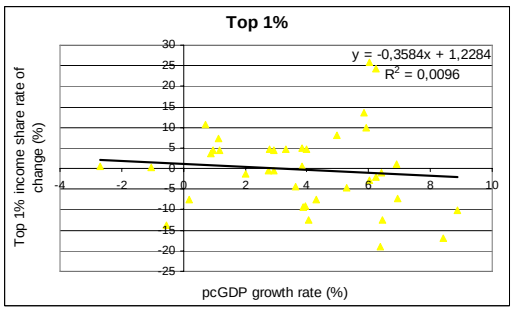
the mid-sixties to 1981, when they possibly reached their historical minimum, and a significant increase from 1989 onwards.

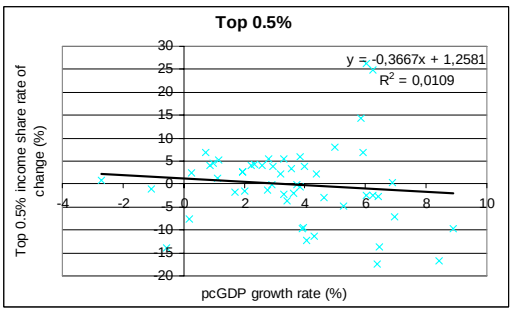
Here it is not possible to offer a complete account of the reasons behind the detected inequality trends. However, some general considerations may serve as a guide for a future research agenda. Firstly, Figure 10 shows the relationship between economic growth and inequality, through the correlation between the GDP growth rate and the rate of change in top income shares, both of which are expressed as three-year moving averages. The figures show a slight negative relationship between the two variables, although this relationship is not constant over time. Figures 11 and 12 show the correlation between economic growth and inequality for the periods before and after 1950. Whereas the relationship is positive during the first period, it becomes negative in the latter. This might indicate that the Portuguese growth process since the 1950s benefited the upper classes less than it did the rest of the population, whereas during the previous period the opposite might have been true.

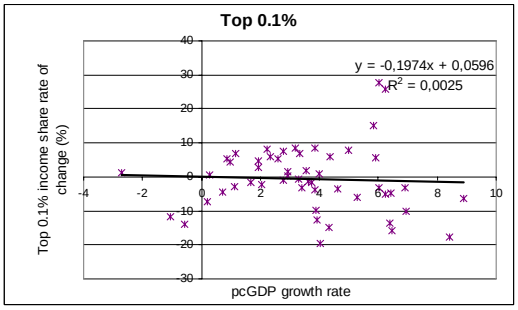
Figure 10 - Correlation between top fractile income shares and economic growth (1936-1999)

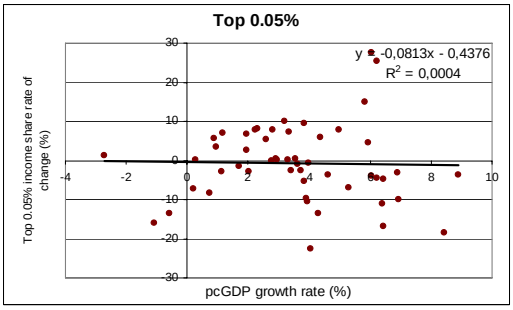


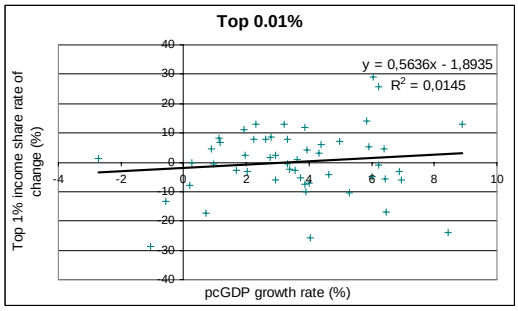






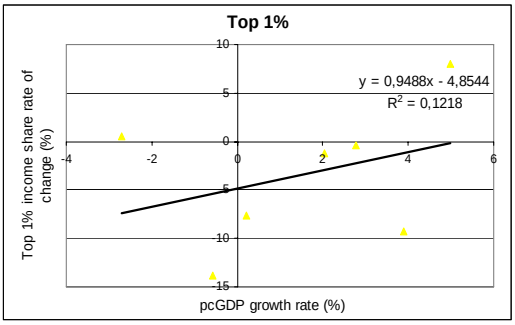


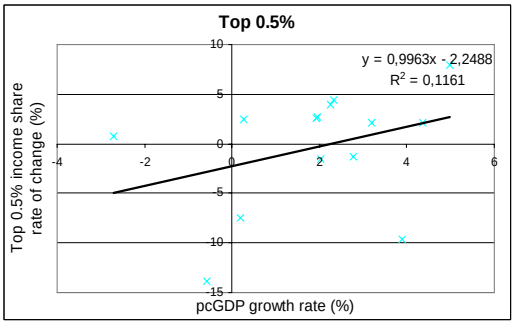


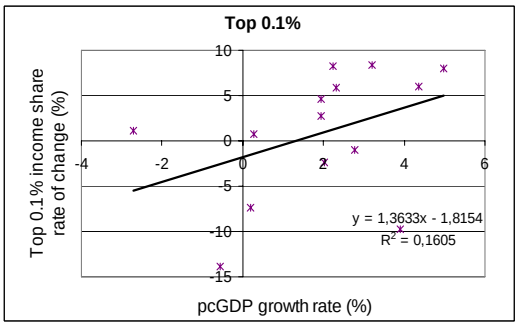


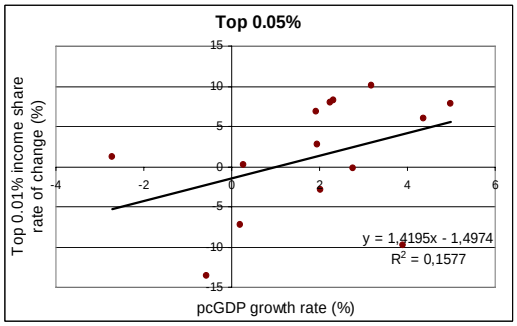
Source: Based on Portuguese tax statistics, population censuses, Batista et al. (1997), Pinheiro (1997) and online INE statistics

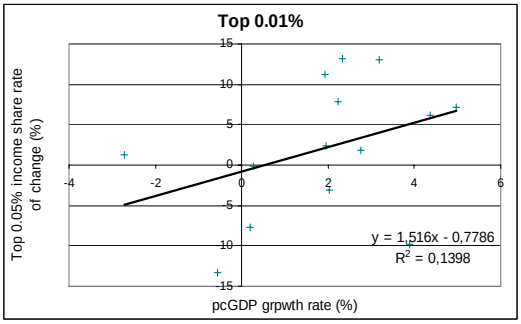
Figure 11 - Correlation between top fractile income shares and economic growth (1936-1949)





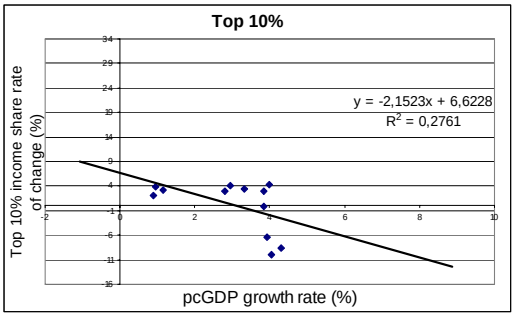


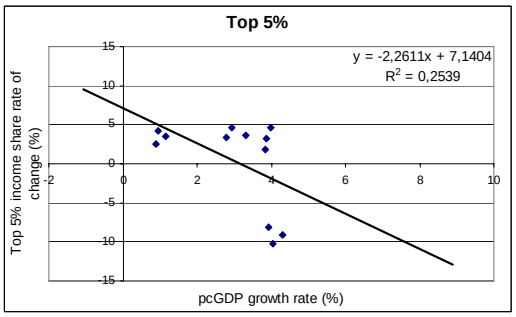


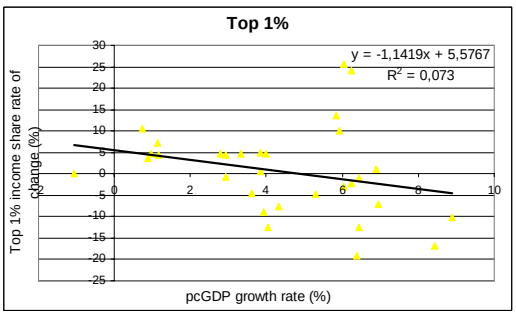


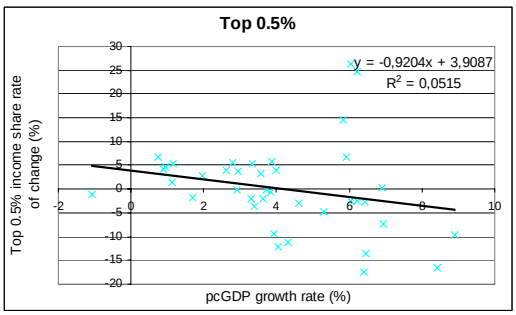
Source: Based on Portuguese tax statistics, population censuses, Batista et al. (1997), Pinheiro (1997) and online INE statistics

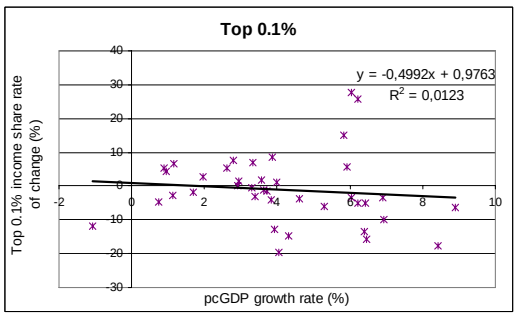
Figure 12 - Correlation between top fractile income shares and economic growth (1950-1999)

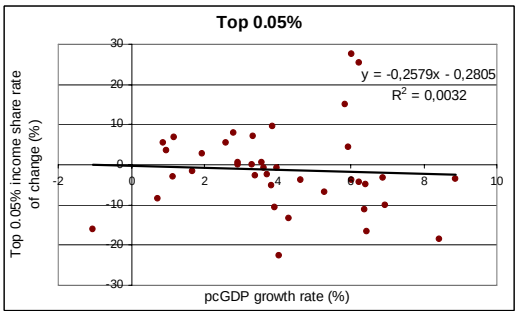


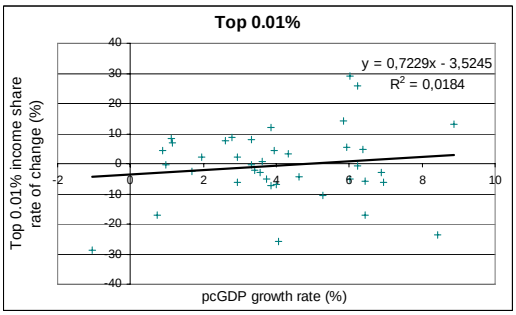












Source: Based on Portuguese tax statistics, population censuses, Batista et al. (1997), Pinheiro (1997) and online INE statistics

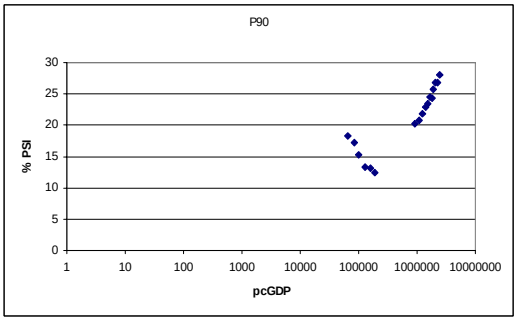
One of the main features that differentiated the periods before and after 1950 was the rapid structural change from an agrarian economy towards an industrial and service-oriented economy. This difference is shown in Table 2. The original Kuznets hypothesis relates the process of structural change to the existence of an inverted-U curve in the evolution of inequality. However, inequality can be measured in different ways. A measure of inequality with complete population coverage is likely to follow an inverted U-curve during the transition from an agrarian economy to a modern one, for the reasons argued in Kuznets (1955). On the other hand, a partial inequality measure, such as top income shares, is likely to find a decline in inequality during this process of transition for the same reasons. This is due to the fact that although the progressive transition of labour force to better paid jobs could increase inequality within the lower classes (that were more homogeneous in terms of their incomes at the beginning of the process), it may also increase the share of incomes accruing to the bottom fractiles, a process which might prevent top income *share* increases. This seems to have been the case in Portugal. In fact, top income shares did not increase again until the nineties, when the process of structural change was almost complete. Figure 13 plots pcGDP with the different top income shares calculated. The picture that emerges from these graphs is a W-curve that could also be seen as an N-curve or even an inverted-Kuznets curve, the right side of the curve being more easily noticeable.

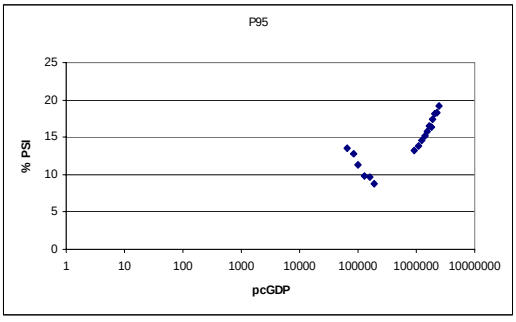
Table 2 – Male labour force (1911-1950) and total employment (1960-1990)

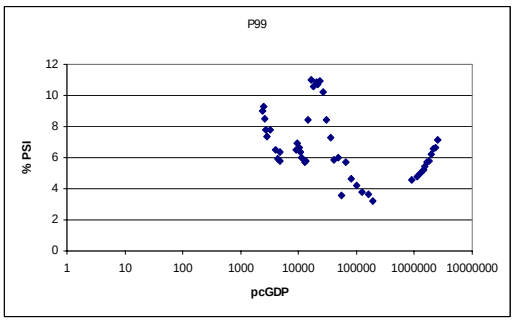
	Agriculture	Industry	Services	Total male labour force
		Percentage		000
1911	61.0	21.7	17.3	1,629
1920	[60.9]	[21.2]	[17.9]	1,691
1930	60.9	20.7	18.4	1,967
1940	57.8	21.0	21.1	2,241
1950	53.8	24.6	21.6	2,562
1960	43.1	28.2	28.7	2,713
1970	27.6	33.9	38.6	2,263
1980	19.2	37.7	43.1	2,544
1990	13.1	37.3	49.6	2,476

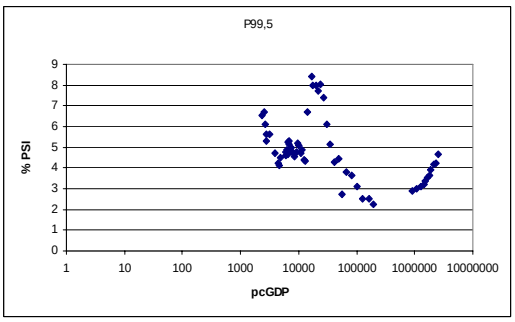
Sources: Lains (2006) for 1911-1950, and Valério (ed.) (2001), p. 164 for 1960-1990.

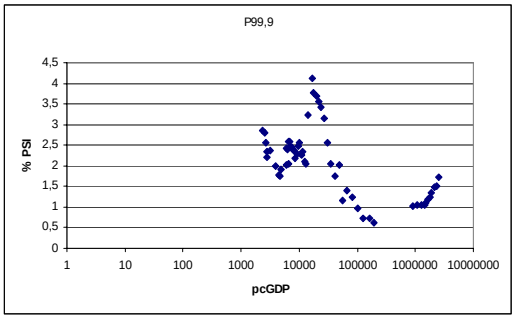
Figure 13 – Economic growth and top income shares.

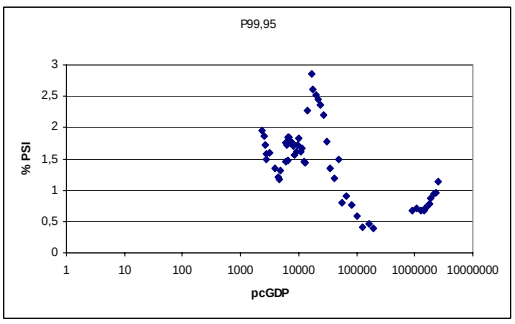


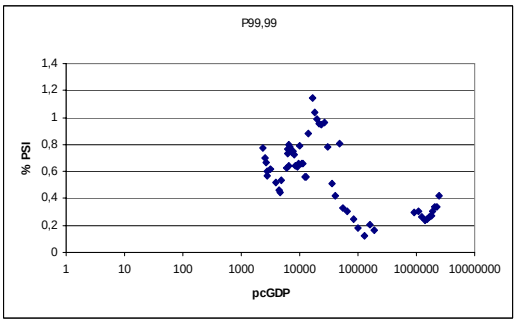












Source: Based on Portuguese tax statistics, population censuses, Batista et al. (1997), Pinheiro (1997) and online INE statistics

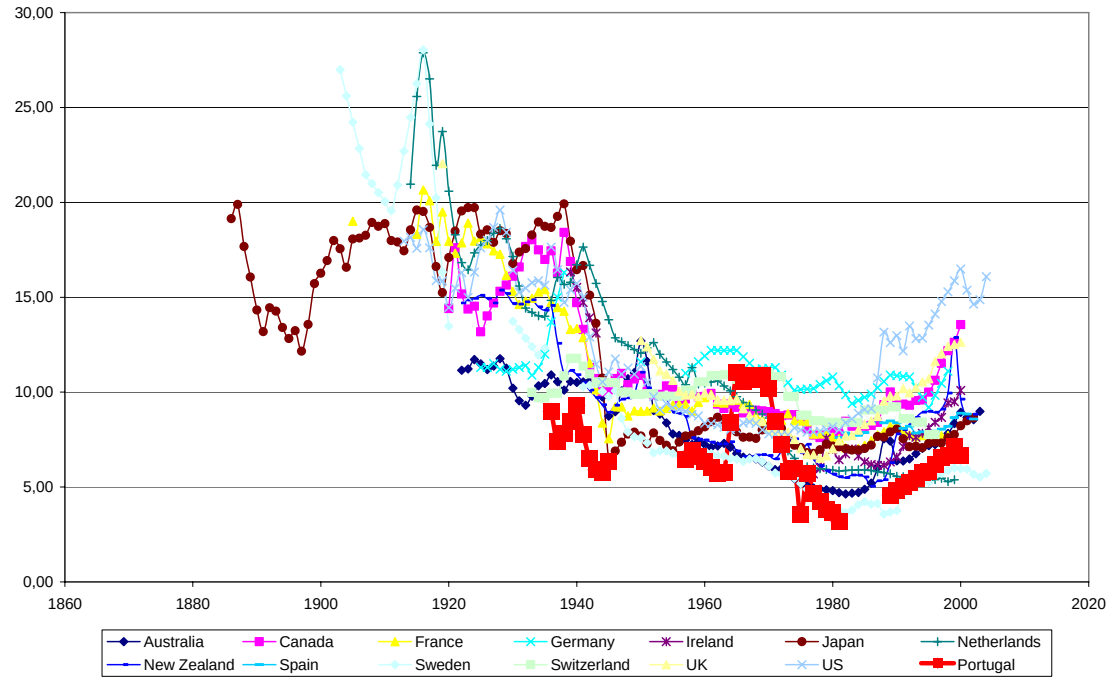
In contrast, and regarding the transition to democracy that began on 25 April 1974, after the *Revoluçao dos cravos*, it is surprising to see that the evolution of the different top income shares was not especially sensitive to the profound political and social changes that occurred at the time. Top income shares declined, but at the same pace as during the pre-revolutionary period. This finding is highly relevant from the point of view of Portuguese history, since the country's upper classes did not seem to have been particularly damaged by the revolutionary process.

4. International comparisons

Figure 14 compares the top 1% of income shares of thirteen developed countries with the new series. As may be seen in the graph, there is a common long-term decline in the series up until the mid-seventies. It can also be seen that the shock of the Second World War provoked a significant decline in the top 1% of income shares in most countries. However, unlike what occurred in the other countries, top income shares in Portugal, Australia and New Zealand recovered their pre-war values in the early fifties.[21]

[21] In the case of Portugal there are no data for the top 1% of income shares for the post-war period, but this recovery can be seen in the evolution of the upper fractiles.

Figure 14 - Top 1% income shares



Source: Leigh (2006) and Guilera (2007) for Portugal

Figure 14 shows the different evolution of top income shares in different countries after the mid-seventies. Whereas top income shares increased in Anglo-Saxon countries, the situation remained more or less stable in the other countries (Piketty and Saez, 2006). Once again, Portugal seems to buck this stylized trend because, at least during the nineties, top income shares clearly increased. The explanation for this trend is still a matter of debate, although Piketty and Saez (2006) have persuasively argued that whereas the previous downside trend could be due to the erosion of large wealth holdings, the recent upward trend could be due to tremendous increases in top wage incomes, which would be replacing the capital owners' decadence in the top income group.

Regarding the current relatively high inequality detected in Portugal in comparison with other European countries,[22] top income shares seem to indicate that the very rich are not at the root of this phenomenon and that it may instead be a poverty-related issue, because the Portuguese top income shares are very low in comparative terms.

5. Concluding remarks

This paper has presented new long-term series on the evolution of top income shares in Portugal from 1936 onwards. The Portuguese case study may help enlarge the current comparative database developed with the methodology established by Piketty (2001). Available comparative information regarding income inequality has been compiled since the fifties (Deininger and Squire (1996), but the methodologies used differ across countries and over time, which seriously limits the consistency of the studies based on these databases. In contrast, top income shares are all estimated from tax sources, following the same methodology, and, in many cases, they provide information for the whole twentieth century[23].

Top income shares in Portugal declined during WWII but recovered during the post-war period. From the mid-fifties onwards top income shares declined sharply, and then increased again in the last decade of the twentieth century. This pattern is quite similar to the experience of other countries: the decline of top income shares during the "Golden Age" has been observed in most other cases, and their increase during the nineties seems to put Portugal on a par with the experience of Anglo-Saxon countries.

[22] Rodrigues (1999).
[23] Although comparability problems should not be forgotten; see Atkinson (2007) and Piketty (2007).

The reasons behind the trends observed in Portuguese top income shares remain poorly understood. Here it has been suggested that the rapid structural change which occurred from the fifties onwards could be a key factor. On the other hand, the transition to democracy seems to have had a minor impact on top incomes shares.

Future research on this issue should seek to estimate top income shares by districts, and also search for the reasons behind the main trends detected in the estimates.

References

Alvaredo, F. and Saez, E. (2006). “Income and wealth concentration in Spain in a historical and fiscal perspective.” CEPR Discussion Paper 5836. Centre for Economic Policy Research, London.

Atkinson, A. B. (2005). “Bringing income distribution in from the cold”, *The Economic Journal*, 107: 297-321

Atkinson, A. B. (2005). “Top incomes in the UK over the twentieth century.” *Journal of the Royal Statistical Society, Series A,* vol. 168 (February), pp. 325–343.

Atkinson, A. B. (2007). “Measuring top incomes: methodological issues.” In *Top Incomes over the Twentieth Century: A Contrast Between Continental European and English Speaking Countries* (ed. A. Atkinson and T. Piketty), pp. 18-42. Oxford: Oxford University Press.

Atkinson, A. B. and Salverda, W. (2003). “Top incomes in the Netherlands and the United Kingdom over the twentieth century”, discussion paper.

Atkinson, A. B. and Leigh, A. (2005). “The distribution of top incomes in New Zealand.” Australian National University CEPR Discussion Paper 503, Australian National University, Canberra.

Atkinson, A. B. and Leigh, A. (2007). “The distribution of top incomes in Australia.” *Economic Record,* forthcoming.

Atkinson, A. and Piketty, T. (2007). *Top Incomes over the Twentieth Century: A Contrast Between Continental European and English Speaking Countries*. Oxford: Oxford University Press.

Banerjee, A. and Piketty, T. (2005). "Top Indian incomes, 1922-2000." *The World Bank Economic Review*, vol. 19, (December), pp. 1-20.

Batista, D., Martins, C., Pinheiro, M., Reis, J. (1997). *New estimates for Portugal's GDP, 1910–1958*. História Económica 7.

Deininger, K. and Squire, L (1996). "A new data set measuring income inequality". *The World Bank economic review*, Vol. 10, nº 3: 565-591.

Dell, F. (2005). "Top incomes in Germany and Switzerland over the twentieth century." *Journal of the European Economic Association,* vol. 3(2-3), (April/May), pp. 412-421.

Direcçao Geral das Contribuçoes e Impostos (1976). *Código do Imposto Complementar.* Ministerio das Finanças, Lisboa.

Kuznets, S. (1953). *Share of upper income groups in income and savings*, National Bureau of Economic Research, New York.

Kuznets, S. (1955). "Economic growth and income distribution". *The American Economic Review*, XLC, 1: 2-28

Leigh, A. (2007), "How Closely Do Top Income Shares Track Other Measures of Inequality?", *Centre for Economic Policy Research Nº 562*, Research School of Social Sciences, Australian National University

Leigh, A. and van der Eng, P. (2007). “Top incomes in Indonesia, 1920-2004.” Australian National University CEPR Discussion Paper 549. Australian National University, Canberra.

Leitao, L. (2001). “*Evoluçao e situaçao da reforma fiscal*.” Ciencia e Técnica Fiscal (387), pp. 7-47.

Lindert P., Milanovic, B. y Williamson, J. (2007). “Measuring Ancient Inequality”, *NBER working paper 13550*, National Bureau of Economic Research, Cambridge.

Nolan, B. (2007). “Long-term trends in top income shares in Ireland.” In *Top Incomes over the Twentieth Century: A Contrast Between Continental European and English Speaking Countries* (ed. A. Atkinson and T. Piketty), pp. 501-530. Oxford: Oxford University Press.

Piketty, T. (2003). “Income inequality in France, 1901-1998.” *Journal of Political Economy*, vol. 111(5), (October), pp. 1004-1042.

Piketty, T. (2007). “Top incomes over the twentieth century: A summary of the main findings” In *Top Incomes over the Twentieth Century: A Contrast Between Continental European and English Speaking Countries* (ed. A. Atkinson and T. Piketty), pp. 1-17. Oxford: Oxford University Press.

Piketty, T. and Qian, N. (2006). “Income inequality and progressive income taxation in China and India, 1986-2015.” CEPR Discussion Paper 5703. Centre for Economic Policy Research, London.

Piketty, T. and Saez, E, (2001). “Income inequality in the United States, 1913-1998.” National Bureau of Economic Research Working Paper 8467, NBER, Cambridge, MA.

Pinheiro, M. (1997). *Séries Longas para a Economia Portuguesa. Pós II Guerra Mundial, vol. I - Séries Estatísticas*. Banco de Portugal, Lisbon.

Portugal (1946). *Imposto Complementar. Decreto-lei nº 35594 e decreto-lei nº 35595.* Impremsa Nacional, Lisboa.

Portugal (1964). *Código do Imposto Complementar.* Ministerio das Finanças, Lisboa.

Portugal (1988). *Código de Imposto Complementar*. Reis dos Libros, Lisboa.

Ribeiro, J. (1968) “A Contra-reforma fiscal”, in *A Reforma Fiscal.* Coimbra, Coimbra Editora

Rodrigues, C. F. (1999). Repartição do Rendimento e Pobreza em Portugal [1994/95] – Uma comparação entre o Painel Dos Agregados Familiares e o Inquérito aos Orçamentos Familiares. *Revista De Estatística*, V(1), 117-142.

Roine, J. and Waldenström, D. (2006). “Top incomes in Sweden over the twentieth century.” Research Institute of Industrial Economics Working Paper 667, Stockholm, Sweden.

Saez, E. and Veall, M. (2005). “The evolution of high incomes in Northern America: lessons from Canadian evidence.” *American Economic Review,* vol. 95(3), (June), pp. 831-849.

Silva, M. and Santos, A. (1980). *Rendimento e riqueza desiguais*, Instituto de Estudos para o Desenvolvimento, Lisboa.

Tavarés, J. (1942). *Código do Imposto Complementar*. Coimbra editora, Coimbra.

Valerio, N. (1994). *As Finanças Públicas Portuguesas entre as duas Guerras Mundiais*. Ediçoes Cosmos, Lisbon.

Valerio, N. (2001). *Estatísticas Históricas Portuguesas*. Instituto Nacional de Estatística, Lisbon.

Appendix 1

Table A1.1 – Tax rates 1936-1945

Income (1000 escudos)	Tax rate (%)	Income (1000 escudos)	Tax rate (%)	Income (1000 escudos)	Tax rate (%)	Income (1000 escudos)	Tax rate (%)
11	0,18	59	2,4	107	3,35	154	4,19
12	0,33	60	2,42	108	3,37	155	4,21
13	0,46	61	2,44	109	3,39	156	4,23
14	0,57	62	2,47	110	3,41	157	4,24
15	0,67	63	2,49	111	3,43	158	4,26
16	0,78	64	2,52	112	3,45	159	4,28
17	0,88	65	2,54	113	3,46	160	4,3
18	0,97	66	2,56	114	3,48	161	4,31
19	1,05	67	2,58	115	3,5	162	4,33
20	1,12	68	2,6	116	3,52	163	4,35
21	1,19	69	2,62	117	3,53	164	4,36
22	1,25	70	2,64	118	3,55	165	4,38
23	1,3	71	2,66	119	3,57	166	4,4
24	1,35	72	2,68	120	3,58	167	4,42
25	1,4	73	2,7	121	3,6	168	4,43
26	1,44	74	2,72	122	3,62	169	4,45
27	1,48	75	2,73	123	3,64	170	4,47
28	1,52	76	2,76	124	3,66	171	4,49
29	1,55	77	2,78	125	3,68	172	4,51
30	1,58	78	2,8	126	3,7	173	4,52
31	1,63	79	2,82	127	3,72	174	4,54
32	1,67	80	2,84	128	3,73	175	4,56
33	1,71	81	2,86	129	3,75	176	4,57
34	1,75	82	2,88	130	3,77	177	4,59
35	1,79	83	2,9	131	3,79	178	4,61
36	1,82	84	2,92	132	3,8	179	4,62
37	1,85	85	2,94	133	3,82	180	4,64
38	1,88	86	2,96	134	3,84	181	4,66
39	1,91	87	2,98	135	3,85	182	4,68
40	1,94	88	2,99	136	3,87	183	4,69
41	1,96	89	3,01	137	3,89	184	4,71
42	1,99*	90	3,03	138	3,91	185	4,73
43	2,01*	91	3,05	139	3,73	186	4,75
44	2,04*	92	3,07	140	3,75	187	4,76
45	2,06*	93	3,09	141	3,96	188	4,78
46	2,09	94	3,11	142	3,98	189	4,8
47	2,12	95	3,13	143	4	190	4,82
48	2,15	96	3,15	144	4,02	191	4,83
49	2,17	97	3,17	145	4,03	192	4,85
50	2,2	98	3,19	146	4,05	193	4,86
51	2,23	99	3,21	147	4,07	194	4,88
52	2,25	100	3,22	148	4,08	195	4,9
53	2,27	101	3,24	149	4,1	196	4,91
54	2,3	102	3,26	150	4,12	197	4,93
55	2,32	103	3,28	151	4,14	198	4,94
56	2,34	104	3,29	152	4,15	199	4,96
57	2,36	105	3,31	153	4,17	200	4,97
58	2,38	106	3,33				

Source: Tavarés (1942), pp. 83-84.

* These tax rates have been modified because the original values provided in the source were unreliable (1.93%, 2.06%, 2.09% and 2.01%)

Table A1.2 – Tax rates 1946-1963

Income (1000 escudos)	Tax rate (%)
From 50 to 100	3
From 100 to 150	4
From 150 to 200	5
From 200 to 250	6
From 250 to 300	7
From 300 to 350	8
From 350 to 400	9
From 400 to 450	10
From 450 to 500	11
From 500 to 550	12
From 550 to 600	13
From 600 to 650	14
From 650 to 700	15
From 700 to 750	16
From 750 to 800	17
From 800 to 850	18
From 850 to 900	19
From 900 to 950	20
From 950 to 1000	21
From 1000 to 1050	22
From 1050 to 1100	23
From 1100 to 1150	24
From 1150 to 1200	25
From 1200 to 1250	26
From 1250 to 1300	27
From 1300 to 1350	28
From 1350 to 1400	29
More than 1400	30

Source: Decreto – lei nº 35595, in Portugal (1946), p. 37.

Table A1.3 – Tax rates 1964- 1975

Income (1000 escudos)	Tax rate (%)	Income (1000 escudos)	Tax rate (%)
Untill 50	3	From 1100 to 1150	25
From 50 to 100	4	From 1150 to 1200	26
From 100 to 150	5	From 1200 to 1300	27
From 150 to 200	6	From 1300 to 1400	28
From 200 to 250	7	From 1400 to 1500	29
From 250 to 300	8	From 1500 to 1600	30
From 300 to 350	9	From 1600 to 1700	31
From 350 to 400	10	From 1700 to 1800	32
From 400 to 450	11	From 1800 to 1900	33
From 450 to 500	12	From 1900 to 2000	34
From 500 to 550	13	From 2000 to 2100	35
From 550 to 600	14	From 2100 to 2200	36
From 600 to 650	15	From 2200 to 2300	37
From 650 to 700	16	From 2300 to 2400	38
From 700 to 750	17	From 2400 to 2500	39
From 750 to 800	18	From 2500 to 2600	40
From 800 to 850	19	From 2600 to 2700	41
From 850 to 900	20	From 2700 to 2800	42
From 900 to 950	21	From 2800 to 2900	43
From 950 to 1000	22	From 2900 to 3000	44
From 1000 to 1050	23	More than 3000	45
From 1050 to 1100	24		

Source: Portugal (1963), p. 25.

Table A1.4 – Tax rates 1976-1981

Income (1000 escudos)	Tax rate (%)
Until 50	4
From 50 to 100	6
From 100 to 200	8
From 200 to 300	14
From 300 to 400	20
From 400 to 500	26
From 500 to 600	34
From 600 to 700	42
From 700 to 800	50
From 800 to 900	60
From 900 to 1000	70
More than 1000	80

Source: Direcçao Geral das Contribuçoes e Impostos (1976), p. 43

Table A1.5 – Tax rates 1989- 1990

Income (1000 escudos)	Income (1000 escudos)	Tax rate (%)
1989	1990	
Until 450	Until 540	16
450-850	540-1020	20
850-1250	1020-1500	27,5
1250-3000	1500-3600	35
More than 3000	More than 3600	40

Source: INE (1997)

Table A1.6 – Tax rates 1991-1999

Income (1000 escudos)	Income (1000 escudos)	Income (1000 escudos)	Income (1000 escudos)	Income (1000 escudos)	Income (1000 escudos)	Income (1000 escudos)	Income (1000 escudos)	Income (1000 escudos)	Tax rate (%)
1991	1992	1993	1994	1995	1996	1997	1998	1999	
								Until 700	14
Until 750	Until 810	Until 860	Until 930	Until 970	Until 1010	Until 1050	Until 1080	700-1105	15
750-1750	810-1890	860-2010	930-2170	970-2260	1010-2350	1050-2435	1080-2500	1105-2750	25
1750-4500	1890-4860	2010-5160	2170-5570	2260-5790	2350-6000	2435-6150	2500-6280	2750-6405	35
More than 4500	More than 4860	More than 5160	More than 5770	More than 5790	More than 6000	More than 6150	More than 6280	More than 6405	40

Source: INE (1997) and Direcçao Geral dos Impostos (2002)

Table A1.7 – Income brackets of the Portuguese tax statistics

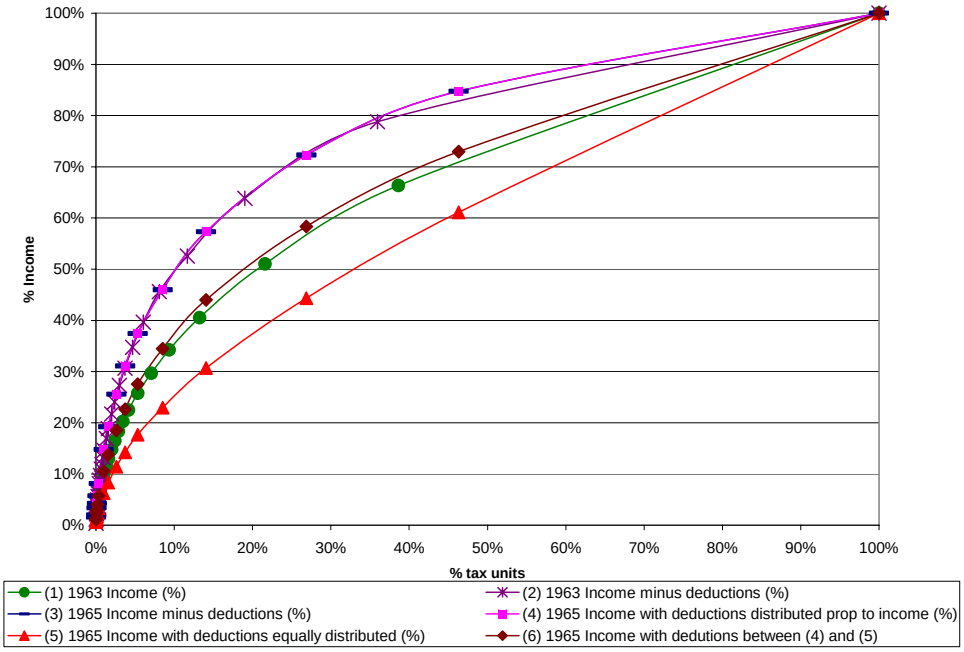
1936-45		1946-63		1964-76		1977-79		1980-81		1989-1999	
From	Until	From	Until	From	Until	From	Until	From	Until	From	Until
11,00	13,40	50	100	0	50	0	50	0	100	0	700
13,40	16,24	100	150	50	100	50	100	100	200	700	1000
16,24	21,00	150	200	100	200	100	200	200	350	1000	1400
21,00	44,57	200	250	200	300	200	300	350	500	1400	1700
44,57	66,04	250	300	300	400	300	400	500	650	1700	2000
66,04	100,40	300	350	400	500	400	500	650	800	2000	2300
100,40	270,97	350	400	500	600	500	600	800	950	2300	2700
270,97	834,83	400	450	600	800	600	700	950	1100	2700	3200
834,83		450	500	800	1000	700	800	1100	1250	3200	3800
		500	550	1000	1500	800	900	1250	1400	3800	4500
		550	600	1500	2000	900	1000	1400		4500	5500
		600	650	2000	2500	1000				5500	6000
		650	700	2500	3000					6000	6500
		700	750	3000	4000					6500	7000
		750	800	4000	5000					7000	8000
		800	850	5000						8000	9000
		850	900							9000	10000
		900	950							10000	15000
		950	1000							15000	20000
		1000	1050							20000	
		1050	1100								
		1100	1150								
		1150	1200								
		1200	1250								
		1250	1300								
		1300	1350								
		1350	1400								
		1400	2000								
		2000	2500								
		2500	3000								
		3000									

Source: Portuguese tax statistics

Appendix 2

Figure A2.1 shows the distributional functions of the incomes of tax units under different hypothesis in 1963 and 1965. The vertical axis shows the percentage of income (relatively to the total income assessed) accumulated through tax units, which are shown in the horizontal axis. The first function (1) shows the distributional function of total incomes in 1963, whereas the second function shows the distributional function of taxable incomes in the same year. As may be seen in the graph, when deductions are subtracted, the distributional function moves upwards. This implies that deductions were progressive to income. For 1965 there is only information on taxable income, which is shown in the third function. This has almost the same shape as the taxable income in 1963. In order to allocate deductions among the income of different tax units for 1965, two different scenarios have been simulated and compared to the situation in 1963. The fourth function shows the distributional function of incomes when deductions are allocated proportionally to income, whereas the fifth function shows the distributional function when deductions are equally distributed among all tax units. Not surprisingly, the third and fourth functions have exactly the same shape, because the fourth function is the outcome of allocating deductions in a proportional system. On the other hand, the fifth function swung downwards according with the progressive character of the deductions. As may be seen, the distributional function of total incomes for 1963 is between these two last scenarios. The sixth function is the arithmetic average of the proportional (4) and progressive (5) scenarios and has been the alternative chosen to allocate deductions for its proximity to total income function of 1963 (1).

Figure A2.1 – Allocation of 1964-1981 deductions



Source: Own elaboration from Portuguese tax statistics