

**DOCUMENTS DE TREBALL**  
**DE LA FACULTAT D'ECONOMIA I EMPRESA**

*Col·lecció d'Economia*

*E11/263*

**The inequality trap**  
**A comparative analysis of social spending between 1880 and 1933**

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I am very grateful to Alfonso Herranz for his valuable comments and advise. I also thank Fabian Gouret, Marc Prat, and Javier San-Julian, for helpful conversations and comments, as well as the participants at 5<sup>th</sup> Iberometrics Conference. Jordi Guilera helped me with top incomes data. Financial support from the Centre d'Estudis Antoni de Campmany, the Spanish MEC (ECO2009-13331-C02-02), and the Xarxa d'Economia i Polítiques Públiques is gratefully acknowledged. Usual disclaimer applies

## **Abstract**

Using two alternative indicators of redistribution -*social transfers* and *social spending*- over the time-period 1880-1933 and using two alternative proxies for inequality -the percentage of non-family farms and the top income shares-, this paper shows that, contrary to what many studies on the origins of the welfare state appear to implicitly suggest, inequality did not favour the development of social policy even in its early stages. Since social policy developed more easily in countries that were previously more egalitarian, it seems that unequal societies were in a sort of *inequality trap*, where inequality itself was an obstacle to redistribution.

Keywords: social policy, inequality, redistribution, comparative economic history  
JEL codes: H50, D63, N30.

## **Resumen**

Utilizando dos indicadores alternativos de redistribución –las *transferencias sociales* y el *gasto social*- durante el periodo de tiempo comprendido entre 1880 y 1933, y utilizando dos indicadores alternativos de desigualdad –el porcentaje de explotaciones agrarias no familiares y los *top income shares*-, este papel muestra que, al contrario de lo que muchos estudios sobre los orígenes del Estado del Bienestar suelen sugerir, la desigualdad no favoreció el desarrollo de la política social ni siquiera en sus etapas iniciales. Ello significa que la política social se desarrolló más rápidamente en los países que previamente ya eran más igualitarios, lo que sugiere que los países con más desigualdad se encontraban en una especie de *trampa de la desigualdad*, donde la desigualdad en si misma fue uno de los obstáculos a la redistribución.

Palabras clave: política social, desigualdad, redistribución, historia económica comparada  
Códigos JEL: H50, D63, N30.

## 1. Introduction

In the early studies about the origins of modern social policy, “*the welfare state [was] seen as an erratic and pragmatic response*” to the problems brought about by industrialization (Fraser ([1973]2003, p. 1). In that sense, constant references we find in that literature to the harsh conditions of life of the new industrial workers, the unhealthy environment of the cities, industrial unemployment or child labour, all this within a context of unprecedented economic growth, seem to suggest that (industrialization-led) inequality was one of those problems which had to be solved. Indeed, explicit references to inequality are often found in studies about the origins of modern social policy. Flora and Heidenheimer (1981), for example, say that equality along with socioeconomic security “*are interpreted as the core of the welfare state*” (p. 9).

The relationship between inequality and redistribution in current days has also been largely studied. There is no consensus, however, on the role of inequality. While the median voter theories maintain that redistribution increases with inequality (Meltzer and Richard, 1981; Alesina and Rodrik, 1994; Persson and Tabellini, 1994), recent papers point in the opposite direction and conclude that inequality has a negative impact on redistribution (Bénabou, 2000, 2004; Lindert, 2004; Barth and Monee, 2009). However, despite the more or less implicit references to inequality we find in the literature of the origins of the welfare state, there are no comparative and quantitative studies focusing specifically on the role played by inequality during the early stages of modern social policy. The aim of this paper is to help filling in this gap by analysing econometrically the impact of inequality on the evolution of social policy in a sample of advanced countries over the time-period 1880-1933. This may in turn contribute to today's debates about the relationship between inequality and redistribution.

Analysing this time-period has also several advantages. Differences in social spending levels over those years were quite large, possibly larger than today. For example, in 1930, social spending (as a percentage of GDP) in Germany was 10 times greater than in Spain and 8 times higher than in Italy. As for inequality, differences were also noticeable. Our sample includes countries such as Spain, Italy and Portugal with high levels of inequality, and others, such as Norway or Denmark, which were

much more egalitarian.<sup>1</sup> Analysing this time-period has also certain advantages when dealing with the problem of endogeneity in the relationship between inequality and redistribution. In studies on present economies, one possible way to avoid this endogeneity problem is using pre-tax inequality indicators but, still, the possibility that current inequality (even before taxes) is not related to redistributive policies applied in previous years cannot be completely ruled out. Between 1880 and 1930, however, social policy was still in its infancy, so it is reasonable to think that inequality was still an exogenous variable (or at least much more exogenous than it is nowadays).

As a dependent variable of my analysis, I have used the series of social transfers estimated by Lindert, which cover the time-period 1880-1930 and are available for more than 20 countries. The main limitation of those social transfers data is that they only include tax-funded public social spending but not social insurance provisions.<sup>2</sup> This may restrict the analysis somewhat, at least in the case of many European countries where the rise of modern social policy was clearly linked to social insurance. For that reason I have made a new estimation of social spending in 1930 and 1933 for 22 countries, which do include social insurances' benefits. This is based on information coming from the surveys of social services published by the International Labour Office in the 1930s, except in the cases of Portugal, where the figures are from Valerio (2001), and Spain, which have been estimated by myself from public budget sources and the statistics of the Spanish National Institute of Social Insurance. Finally, as well as the aggregate volume of social spending, I have analysed the influence of inequality on the different social programmes (pensions, health, welfare, etc.), for both Lindert's social transfers and my social spending data. This has enabled a more detailed analysis. For example, the econometric outcomes suggest that, during the time-period under study, autocratic governments prioritized spending on traditional welfare, while democratic governments leant towards more modern-style programmes, such as health spending.

Our results indicate that inequality had a negative impact on both social transfers and my new estimation of social spending. This applies for both democratic and non-democratic countries. However, it seems that the negative effect of inequality was smaller in democracies. In other words, egalitarian democracies tended to redistribute more, not less, than unequal democracies, and the same can be said of the autocratic governments: redistribution was greater where there was less inequality.

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<sup>1</sup> More detailed information on the definition of social spending and inequality can be found in the following sections.

<sup>2</sup> Social insurances were funded via employers' and workers' contributions (the so-called social contributions) plus public subsidies. Lindert includes these public subsidies (plus other government social expenditures) but not the final benefits paid by social insurances.

However, under the same level of inequality, democratic countries appear to have been more sensitive to demands for redistribution than dictatorships. It could therefore be said that unequal countries found themselves in a kind of *inequality trap*, since high levels of inequality were reinforced by ungenerous redistributive policies.

The paper is organized as follows. The next section summarizes some of the main theories on the relationship between inequality and redistribution. In Section 3 we present our new estimation of social spending and compare it with Lindert's series of social transfers. Sections 4 and 5 analyse the impact of inequality on social transfers and social spending, respectively. Section 6 looks at possible implications of our results for the evolution of the political regime. From Boix (2003) and Engerman and Sokoloff (2002, 2005) one can derive that inequality hampers the stability of democracy. The mechanism is straightforward. In these models redistribution is assumed to increase with inequality under democracies. Therefore, if inequality is very high, the social elites will support non-democratic governments to avoid redistribution. In Section 6 we show, however, that we do not need redistribution to increase with inequality for economic elites to have incentives to support autocratic governments. We just need that, for a given level of inequality, democracies are more redistributive than dictatorships. Finally, section 7 concludes.

## **2. Theories on inequality and redistribution**

According to the median voter models, redistribution increases with inequality. If the median voter income is below the mean income (i.e. under high inequality levels) then a majority of voters (all those whose income is less than the mean) will support redistribution (Meltzer and Richard, 1981; Alesina and Rodrik, 1994; Persson and Tabellini, 1994). However, the empirical evidence suggests that inequality does not always give rise to more redistribution (Perotti, 1994, 1996; and Alesina et al., 2001). To explain this, Roemer (1998) has modelled an old leftist argument, suggesting that, besides redistribution, there are other dimensions in the political debate (such as debates on ethnic and religious issues, for example) that divide pro-redistribution voters. Similarly, Luttmer (2001) and Alesina *et al.* (2001) argue that ethnic divisions are harmful to redistribution because many individuals tend to oppose it when the beneficiaries are mainly members of other ethnic groups.

By contrast, other authors maintain that, far from increasing, redistribution decreases with inequality. Lindert (2004) calls this the *Robin Hood paradox* and says that support for redistribution does not depend on the gap between the median voter's income and the average earnings, but on the gap between the middle-income groups (who are electorally decisive) and the lower-income groups. If the gap between both groups is small enough, then the middle-income groups will probably be more empathetic towards the beneficiaries of social policy. They can even feel that they themselves may at some point become potential beneficiaries of social policy and, therefore, they will be more willing to support redistribution.

The model by Kristov *et al.* (1992) also helps to explain why inequality could have a negative effect on redistribution. According to these authors, an individual's political participation depends on his or her absolute level of income. This is because (absolute) poverty increases the time preference for present consumption and reduces any type of saving, including investment in political activities (whether in the form of time or money). Therefore, if inequality involves an increase in absolute poverty levels, then social groups more willing to support redistribution will be excluded from the political process, and the political pressure in favour of redistribution will lessen.

According to Bénabou (2000, 2004), if there are market failures, then redistribution may generate efficiency gains.<sup>3</sup> These, in turn, can offset the cost of redistribution for a portion of those individuals who initially pay for it. In an egalitarian society, where the level of income of the wealthiest individuals is not much higher than the average, the cost of redistribution for the former will not be very high and will be easily offset by the efficiency gains. Consequently, resistance to redistributive policies will be low. By contrast, in a society with high inequality there will be a large number of sufficiently wealthy individuals for which the efficiency gains will not offset the cost of redistribution. As a result, political support for redistribution will be lower.

Bénabou (2000, 2004) also considers that, even in democratic countries, political power and influence depend on income levels,<sup>4</sup> so that the upper-income

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<sup>3</sup> A good example would be public investment in education, which finance the education of many students with no access to private credit, increases the provision of human capital and stimulates economic growth.

<sup>4</sup> Using data from Rosenston and Hansen (1993) and Bartels (2002) for the United States, Bénabou (2000) shows that the poorest and least educated individuals tend to vote less, contribute less to electoral campaigns (in economic terms), and participate less in time-intensive activities (such as writing to their Members of Congress, attending meetings or campaigning for their political choice). In addition, senators and congressmen are usually much more sensitive to the demands of high income groups. In developing countries, the bias in favour of high income groups is probably more acute due to practices such as vote-buying, graft and outright intimidation.

groups have more political influence than the lower-income groups.<sup>5</sup> This means that the decisive voter will not be the median voter but someone located at some point in the distribution above him/her.<sup>6</sup> This reinforces the negative relationship between inequality and redistribution described above. Thus, in a context of low inequality, the consensus that favours redistribution will be strengthened by the fact that political power will also be fairly distributed. In a context of increasing inequality, however, the pressures against redistribution will be strengthened because the relative political power of the wealthiest will also be higher.

Finally, Alesina and Drazen (1991) and Rodrik (1999) maintain that macroeconomic stabilizations are usually delayed in countries with high levels of inequality. The reason is that they have greater difficulties in reaching a consensus on how the stabilization costs should be shared. Similarly, Berg and Sachs (1988) argue that countries with higher inequality have to renegotiate their foreign debt more frequently because they find it more difficult to stabilize their budget in the long term. These theories do not explicitly refer to social policy. However, it seems reasonable to believe that countries with high inequality will also find it more difficult to reach agreements as to how social policy should be funded. In all likelihood, the redistributive implications of each funding alternative (basically direct taxes, indirect taxes and social security contributions) will become more acute. If inequality is high, for example, the regressive character of indirect taxes will be more pronounced, and the opposition of the poorest will also be more intense. The same could apply to direct taxes, but the other way round: their progressive character will become more pronounced and the opposition of the wealthiest will also be greater.

### **3. Social protection indicators before 1930-33**

The social transfers database, created by Lindert, is no doubt the most important that exists for the pre-World War II period. It provides information for over

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<sup>5</sup> Note that, according to Bénabou (2000, 2004), political influence depends on the relative level of income and not on its absolute level. If political influence depended on absolute income, once a certain income threshold had been crossed there would be no inequality of power between rich and poor; and inequality would only be able to reduce the political power of the poor if it involved an increase in absolute poverty.

<sup>6</sup> Let us suppose that the decisive voter is located in percentile  $100 \times p^*$  (where  $p^*$  is between 0 and 1). In a perfect democracy, this would be located at  $p^* = 1/2$ , i.e. it would be the median voter. If the democracy is imperfect and the capacity for political influence increases with income, then the decisive voter will be located at  $p^* > 1/2$ . Formally this is equivalent to saying that the poor vote less and/or their votes are worth less.

20 different countries in 10-year intervals between 1880 and 1930 (1880, 1890, 1900, 1910, 1920, 1930).<sup>7</sup> According to Lindert's definition, social transfers include tax-funded public provisions. However, social insurance benefits (which were funded by public subsidies plus employers and employees contributions) are not included in the estimations because they do not imply redistribution through public-budgets. Only public subsidies to social insurance schemes are included (Lindert, 1992, 1994). Neither are provisions for civil servants included. Lindert considers these to be the result of the particular labour relationship existing between the State and its employees. Therefore they receive the same treatment as the private-collective insurance benefits that many companies offer their employees. Finally, Lindert classifies social transfers by programme (pensions, health, and welfare and unemployment), but this classification should be analysed with caution, because, as Lindert himself warned, it is difficult to be precise about the aim of many social programmes, which were often oriented towards the poor in general.

The definition of social transfers adopted by Lindert is aimed at capturing the impact of those social protection measures that implied redistribution via public budgets and were addressed to the population as a whole and not to specific groups (such as civil servants). However, the exclusion of social insurance provisions may seem more controversial. At least at the time of their creation, social insurances must have had far-reaching redistribution implications (although not via the public budget). Social insurance contributions meant an obvious expense for both employers and employees, and each of those groups must have tried to impose the largest possible burden of cost on the other.<sup>8</sup> In some cases, these fights over redistribution even put the introduction of social insurances in jeopardy. For example, one of the reasons why the French law of 1910 establishing mandatory social insurances failed was because workers refused to pay the mandatory contributions (Ashford, 1989). Similarly, the

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<sup>7</sup> The data is available on Lindert's website (<http://lindert.econ.ucdavis.edu/index.cfm?employeeid=17&currentNav=12>). The information there is almost identical to that published in Lindert (1994) and the working-paper version (Lindert, 1992), though with slight updating. However, several countries for which Lindert (1994) warned there were problems with the data do not appear in the latest version. These problems may have arisen because there was no information on certain relevant explanatory variables (Bulgaria, Rumania and Yugoslavia), because they were not independent countries for most of the period (Ireland, Czechoslovakia, Hungary, Poland), or because the exact level of social spending was not known (Germany and Switzerland). Moreover, in earlier versions, the information for most of these countries referred only to 1930. To keep homogeneity, the mentioned countries have not been included in the next section's econometric analysis. Therefore the countries included in the sample are: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Italy, Japan, the Netherlands, New Zealand, Norway, Sweden, the United Kingdom, the United States, Greece, Portugal, Spain, Argentina, Brazil and Mexico. Table A.1 in the appendix shows Lindert's estimates of *social transfers*.

<sup>8</sup> In the long term, it is plausible to assume that social contributions are equivalent to a tax on labour, no matter whether they are paid by employers or employees (Bandrés, 1998). However, it does not mean that they did not involved redistributive fights at the time of their creation.

Spanish Workers' Compulsory Retirement Act of 1919 only imposed the obligation to contribute on employers, precisely to avoid labour opposition (Elu, 2006).

Social insurances played an important role in the configuration of modern social protection systems in many continental European countries. Consequently, they have been the focus of much attention in a number of studies on the origins of the welfare state (such as Flora and Heidenheimer, 1981; Flora, 1983; Baldwin, 1990; and Hicks, 1999). As Lynch (2006) points out, it seems that when modern social policy was being shaped, there were two alternative forms of public intervention: one based on citizens' rights, predominant in Anglo-Saxon countries and Scandinavia, and another in which benefits were linked to the position in the labour market. In the former, the aim of social policy was to cover the gaps in private insurance and friendly societies. In these cases the State offered tax-funded non-contributory provisions for children, the sick and the elderly who had no private coverage. In the latter, social policy focused on forcing companies to fund their employees' social insurances (normally along with the workers themselves, plus state subsidies). Hence, only workers (with jobs) received social protection. Many countries of continental Europe chose to follow the second path. However, under the influence of the Beveridge report, many of them tried to unify and universalize their social protection systems after World War II. The importance of social insurances in the origins of the welfare state is also reflected in the OECD definitions of public social spending. In both the first database published in 1985 and the current series, OECD definitions include those provisions charged to social security funds,<sup>9</sup> which are the descendants of the former social insurances. It is therefore interesting to analyse the determinants of spending on social protection including social insurance provisions too.

With this aim in mind, I have made a new estimation of social spending levels in 1930 and 1933, which includes social insurances' benefits. My sample incorporates 22 countries, which are: Australia, Belgium, Bulgaria, Canada, Czechoslovakia, Denmark, Finland, France, Germany, the Netherlands, Hungary, Ireland, Italy, Japan, Poland, Portugal, the Soviet Union, Spain, Sweden, Switzerland, the United Kingdom and Yugoslavia.<sup>10</sup> The information comes from the reports on social protection published by the International Labour Office in 1933 and 1936, which distinguish between two types of social spending: spending on social security and spending on social assistance. In the case of Portugal the information comes from Valerio (2001), while for Spain the

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<sup>9</sup> OECD (1985) p 76; OECD (2007) pp 8-9.

<sup>10</sup> In some cases, the information for certain social spending items were not available for 1930 and 1933 but for other nearby years such as 1929, 1931 or 1934.

information has been estimated directly from public budgets, the Spanish statistical yearbooks and the reports and statistics of the Spanish National Institute of Social Insurance (*Instituto Nacional de Previsión*). For convenience, from now on we will use the term *social transfers* to refer to Lindert's estimations and the term *social spending* to refer to our alternative database<sup>11</sup>.

This new estimation includes tax-funded benefits provided by the public authorities, typically public spending on health-care, poor-relief, unemployment, and non-contributory pensions. It also includes compulsory social insurances' benefits (basically workmen's compensation, pensions, sickness-leave, maternity-leave and unemployment compensation). Subsidized voluntary social insurances' benefits are only included as long as they were regulated and funded by the State. Normally, government regulations on voluntary (subsidized) social insurances established benefit levels (maximum benefits, maximum duration -in days or weeks- of benefits, etc.) and qualifying conditions (maximum annual income which workers may earn and still be qualified for benefits, minimum age, the economic sectors covered by the insurance, minimum contribution period, "waiting periods", etc.). In order to qualify for public subsidies, unions, mutual-aids and any other institution providing voluntary (subsidized) social insurance were required to accept these regulations. Therefore the degree of government control was considerable.

Subsidized voluntary social insurance was sometimes conceived as a first step towards compulsory social insurances. However, especially in Scandinavian countries, they became very important in terms of the number of people insured and the level of benefits.<sup>12</sup> In any case, subsidized voluntary insurances should not be confused with *pure* private insurances. The latter could also cover social risks such as sickness or unemployment, but received no public subsidies (or very little) and were only subject to the general regulations governing friendly societies and/or insurance companies, but in no case to a strict specific legislation for each type of risk. The provisions of *pure* private insurance have not been included in our estimations. Neither have the benefits for civil servants. Provisions for workers in public companies, however, have been included only when these workers were subject to general legislation on social protection and it was clear that those benefits were not the result of a private labour relationship with the public company.

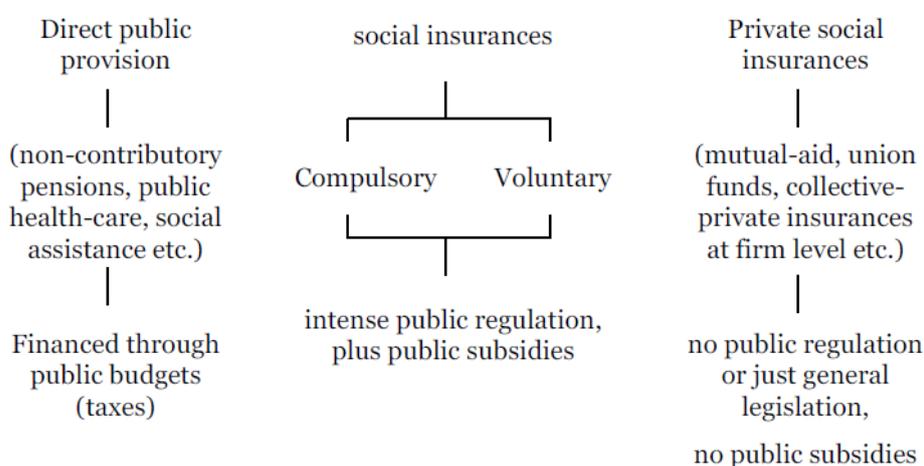
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<sup>11</sup> Table A.2 in the appendix shows my new estimates of *social spending*.

<sup>12</sup> For figures on affiliates to social insurances (both compulsory and subsidized voluntary) from the end of the 19th century, see Flora (1983). For health insurance and the importance of subsidized voluntary insurances in many countries, see Murray (2007). For the importance of the so-called Ghent model, which was the subsidized voluntary insurance in the case of unemployment, see Espuelas (2010).

Figure 1 shows the main types of social protection provisions that coexisted at the early stages of modern social policy: direct public benefits, social insurances benefits, and private insurance and friendly societies. Our estimation includes direct public benefits plus social insurances benefits (both compulsory and subsidized voluntary ones). Lindert's estimation includes only direct public benefits plus public subsidies for social insurances, but not their benefits. Private insurance and friendly societies benefits are not included in either of the two estimations.

**Figure 1. Alternative ways of social protection in the initial stages of the welfare state**



In order to express the *social spending* data as a percentage of GDP we have used Clark's (1957) estimations of current GDP, except for Spain and Portugal, where GDP figures have been taken from Prados de la Escosura (2003) and Valerio (2001) respectively, and for the GDP of the Soviet Union, which is based on Allen (2003), who provides data on the Soviet GDP in 1937 roubles for the period 1928-1940 and gives information on the evolution of prices between 1927-28 and 1937. Table 1 shows a comparison between the levels of *social transfers* estimated by Lindert for 1930 and our estimations of *social spending* for the same year. As expected, the levels of social spending are higher in our estimation, which includes social insurances benefits. Only in the cases of Finland and Yugoslavia Lindert's figures are slightly higher than those presented here, which is probably explained by the fact that the sources used are not exactly the same. In some countries the difference between the two estimates is not very wide. For instance, our estimate for Ireland amounts to 4.48% of GDP as opposed to 3.87% in the case of Lindert's data. However, sometimes the difference is much

bigger. For example, social spending in the UK in 1930 was 6.52% of GDP, according to our estimations, while according to Lindert's estimations it was just 2.32%. In the case of Czechoslovakia, our estimations of social spending are also much higher: 2.91% of GDP as opposed to 0.51%.

**Table 1. Comparison of *social transfers* and *social spending* in 1930 (% of GDP)**

|                | (Lindert's estimates)   |               | (own estimation)       |               |
|----------------|-------------------------|---------------|------------------------|---------------|
|                | <i>social transfers</i> | Ranking order | <i>social spending</i> | Ranking order |
|                | (1)                     | (2)           | (3)                    | (4)           |
| Germany        | 4.96                    | 1             | 11.15                  | 1             |
| Ireland        | 3.87                    | 2             | 4.48                   | 5             |
| Denmark        | 3.11                    | 3             | 4.80                   | 4             |
| Finland        | 2.97                    | 4             | 2.11                   | 10            |
| Sweden         | 2.59                    | 5             | 3.84                   | 6             |
| UK             | 2.32                    | 6             | 6.52                   | 2             |
| Australia      | 2.11                    | 7             | 5.79                   | 3             |
| Switzerland    | 1.17                    | 8             | 2.18                   | 9             |
| Poland         | 1.08                    | 9             | 2.03                   | 11            |
| France         | 1.05                    | 10            | 2.49                   | 8             |
| Holland        | 1.03                    | 11            | 1.61                   | 14            |
| Belgium        | 0.56                    | 12            | 1.83                   | 13            |
| Czechoslovakia | 0.51                    | 13            | 2.91                   | 7             |
| Spain          | 0.45*                   | 14            | 0.44*                  | 18            |
| Portugal       | 0.35*                   | 15            | 0.35*                  | 19            |
| Canada         | 0.31                    | 16            | 0.68                   | 16            |
| Japan          | 0.21                    | 17            | 0.67                   | 17            |
| Hungary        | 0.10                    | 18            | 1.88                   | 12            |
| Yugoslavia     | 0.09                    | 19            | 0.07                   | 21            |
| Italia         | 0.08                    | 20            | 1.40                   | 15            |
| Bulgaria       | 0.02                    | 21            | 0.14                   | 20            |

Sources: figures on *social transfers* for Australia, Belgium, Canada, Denmark, Finland, France, Holland, Italy, Japan, Sweden and the UK come from Lindert's web site. Figures on Germany, Bulgaria, Czechoslovakia, Hungary, Ireland, Poland, Switzerland and Yugoslavia come from Lindert (1994). Note that, as mentioned in footnote 6, the information for the latter group of countries is, in most cases, only available for 1930. For this reason, they have not been included in next section's econometric analysis. Here they have been included for comparative reasons only.

\* Social transfers in both Spain and Portugal are my own and have been estimated following Lindert's definition (for more details see notes on table A.1).

If all the countries are ordered according to their level of generosity, no great differences can be seen, in the sense that the 10 most generous countries are still practically the same: basically the developed countries of north-west Europe plus Australia. The 10 least generous countries, those occupying the bottom half of Table 1, are also still practically the same. However, there are a few changes in their relative positions when social insurance benefits are included. Germany's top position, for example, is more evident in the last column of the Table. Meanwhile the Scandinavian countries (where public subsidies for voluntary social insurances were very important)

lose out to Great Britain and Australia, which move up into second and third position respectively. Italy, Hungary and Czechoslovakia (where social insurance provisions played a very important role) move up a number of places. In short, the new estimations produce noticeably higher figures for social spending than Lindert's estimations and also bring about changes in relative positions, with a relative improvement of those countries where social insurances played an important role.

Finally, as in the case of Lindert's data, our estimates can also be broken down by programme. However, the information contained in the ILO reports is not completely homogeneous. Classification criteria and the level of detail of the information varied from country to country. Despite the difficulties, we have been able to classify benefits into 3 categories of social spending: pensions, health, and welfare and unemployment. The first one includes old-age, survivors's and widow's pensions, plus workmen's compensation. The latter awarded disability pensions and also temporary incapacity benefits. However, it was impossible to distinguish between them. Consequently they have all been grouped together under the pensions heading. Health spending includes health-care spending plus sickness and maternity leave benefits. Finally, spending on welfare and unemployment includes family allowances, benefits for the unemployed, and the traditional poor-relief which was often given to the sick, the unemployed or the elderly without distinguishing between them.

#### **4. The determinants of *social transfers* between 1880 and 1930**

##### *4.1. Data and variables*

The aim of this section is to analyse the role of inequality in the early stages of social policy. The basic model to be estimated is given by Equation (1):

$$(1) \quad REDIST = \alpha_0 + \alpha_1 INEQ + \alpha_2 Z + \varepsilon_1$$

where *REDIST* is the level of redistribution, *INEQ* is the level of inequality, and *Z* is a group of variables that are normally included in comparative studies on the determinants of social policy. The series of social transfers estimated by Lindert is used, in this section, as an indicator of redistribution. As mentioned earlier, it covers the time-period 1880-1930; the information is available for 10-year intervals (1880, 1890,

1900, 1910, 1920 and 1930) and embraces 21 different countries. In the case of Spain the figures are our own and in the case of Portugal they come from Valerio (2001).

Two alternative variables that capture the distribution of income before taxes have been used as a proxy of inequality: the percentage of non-family farms and the top income shares. Information on the former comes from Vanhanen (1997), who defines a family farm as one that provides work for a maximum of four people, including family members. The size of family farms can therefore change over time and from one country to another, depending on the technology or weather conditions. The purpose of this criterion is to separate family farms from big farms worked by paid employees. Note that it is the percentage of *non-family farms* (the opposite of Vanhanen's percentage of family farms) that is used here, because the aim is to have an indicator of *inequality*, not *equality*.

The *percentage of non-family farms* variable has the advantage of not being subject to problems of endogeneity, because there is no reason to think that *social transfers* had a direct influence on the distribution of land ownership. However, this indicator loses representativity as the industrialization process advances and agriculture loses weight in the economy. Even so, it appears to be a reasonable proxy, especially in a period such as ours on which information is very limited and the agrarian sector was much more important than nowadays. In fact, this variable has been used in a number of earlier studies as a proxy for overall inequality (Vanhanen, 1997; Boix, 2003; Keefer and Knack, 2002). Similarly, Alesina and Rodrik (1994) used land inequality as a proxy for overall inequality.

Nevertheless, given the limitations of the *percentage of non-family farms* variable, the *top income shares* have also been used as an inequality proxy in order to make the exercise more robust. At first glance there should be no endogeneity problems here either since the *top income shares* are based on information that captures pre-tax income levels. Atkinson *et al.* (2009) maintain that *top income shares* can have a considerable influence on the evolution of the Gini coefficient and therefore they would appear to be a reasonable indicator of inequality. However, their main drawback is that they refer to a very small percentage of population and therefore do not capture those income variations that occur in the lower part or the centre of the distribution. Top income shares data come from Atkinson *et al.* (2007) and from Guilera (2010) in the case of Portugal. Both sources provide information covering various percentages of the wealthiest population (the top 10%, 5%, 1% etc.). Here, we have used the top 0.1%

income share because this was the band that offered the greatest number of observations, although the number is still small: 39 in the time-period 1880-1930. Nevertheless, this variable has been maintained to allow comparisons with the results obtained with the *percentage of non-family farms*.

The control variables (parameter Z in Equation 1) include the logarithm of GDP per capita, the ageing of population –measured by the percentage of population over 65– and the degree of political democratization. GDP figures come from Maddison, the percentage of population over 65 has been taken from the Lindert website database, except for Spain, which comes from Nicolau (2005); and the *polity2* index created by the Polity IV Project -which ranges from -10 (perfect autocracy) to 10 (perfect democracy)- has been used to measure the degree of democratization. The expected sign of the coefficients of the income level and ageing of population variables is positive. Actually, Pampel and Williamson (1989) and Mulligan *et al.* (2010) consider that they are the most important variables to explain the development of social policy. The expected sign of the degree of democratization, however, is less clear. Initially one might think that democracy should have a positive effect on social spending, since it guarantees the right to vote to lower-income groups and allows the existence of left-wing parties and workers' unions (Lindert, 1994; Hicks, 1999; Espuelas, *forthcoming*). Mulligan *et al.* (2010), however, maintain that the existence of democracy is not determinant for the development of social policy. Hence the expected sign of this variable is not clear.

## 4.2. Results

### A. Percentage of non-family farms as an indicator of inequality

As in Lindert (1994), the estimation method used in the regressions is a *tobit* model, because our endogenous variable, the level of *social transfers* as a share of GDP, is partially censored. Below a certain threshold it takes value zero, but this does not indicate that the “real” level of *social transfers* was really zero. It just means that *social transfers* must have been very low, close to zero, but the available sources do not allow to precise the “real” value. Column 1 of Table 2 presents the results of estimating the basic model of Equation (1). As expected, both the level of GDP per capita and the ageing of population show a positive and statistically significant impact on total social transfers. The coefficient associated to the degree of democratization is also positive and clearly significant. This indicates that the advent of democracy and the subsequent

incorporation of lower-income groups into the political process stimulated the development of social policy. Inequality, on the other hand, approximated by the percentage of non-family farms, has a negative and highly significant effect, just the opposite of what would have been expected according to the median voter models. However, our sample includes both democratic and non-democratic countries, and median voter models apply only to democratic countries. Therefore, in order to strictly test the median voter hypothesis, the regressions have been re-run adding a multiplicative variable (democracy \* inequality) in column 2. Thus the new estimation becomes:

$$(2) REDIST = \alpha_0 + \alpha_1 INEQ + \alpha_2 INEQ \times Democracy + \alpha_3 Z + \varepsilon_1$$

where  $INEQ \times Democracy$  is the new multiplicative variable and the rest of the parameters are the same as in Equation (1). The total marginal effect of inequality under democracy in this new estimation would be:

$$(3) \frac{\partial REDIST}{\partial INEQ} = \alpha_1 + \alpha_2 \times Democracy$$

**Table 2. The determinants of total social transfers as a % of GDP, 1880-1930 (I)**

|                              | (1)                   | (2)                   | (3)                   | (4)                   | (5)                   | (6)                   | (7)                   | (8)                   | (9)                   |
|------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| C                            | -5.070 ***<br>(1.150) | -4.802 ***<br>(1.144) | -4.875 ***<br>(1.142) | -4.882 ***<br>(1.167) | -4.635 ***<br>(1.167) | -4.600 ***<br>(1.165) | -4.298 ***<br>(1.180) | -3.607 *<br>(1.857)   | -3.628 *<br>(1.882)   |
| Log(GDP per cap)             | 0.583 ***<br>(0.130)  | 0.602 ***<br>(0.130)  | 0.582 ***<br>(0.128)  | 0.556 ***<br>(0.132)  | 0.537 ***<br>(0.136)  | 0.542 ***<br>(0.132)  | 0.520 ***<br>(0.135)  | 0.589 ***<br>(0.187)  | 0.591 ***<br>(0.186)  |
| Elderly                      | 0.257 ***<br>(0.043)  | 0.248 ***<br>(0.044)  | 0.253 ***<br>(0.043)  | 0.251 ***<br>(0.041)  | 0.246 ***<br>(0.041)  | 0.245 ***<br>(0.041)  | 0.238 ***<br>(0.041)  | 0.189 *<br>(0.105)    | 0.190 *<br>(0.106)    |
| Democracy                    | 0.025 **<br>(0.012)   | -0.028<br>(0.036)     |                       | 0.024 **<br>(0.012)   | 0.028 **<br>(0.013)   |                       |                       | 0.004<br>(0.013)      |                       |
| Non-family farms             | -0.010 ***<br>(0.004) | -0.015 ***<br>(0.005) | -0.012 ***<br>(0.003) | -0.010 ***<br>(0.004) | -0.009 ***<br>(0.003) | -0.012 ***<br>(0.003) | -0.012 ***<br>(0.003) | -0.030 ***<br>(0.011) | -0.030 ***<br>(0.010) |
| Non-family farms*democracy   |                       | 0.0008<br>(0.001)     | 0.0004 **<br>(0.000)  |                       |                       | 0.0004 **<br>(0.000)  | 0.0005 ***<br>(0.000) |                       | 0.0001<br>(0.000)     |
| Time-trend                   |                       |                       |                       | 0.022<br>(0.040)      |                       | 0.030<br>(0.040)      |                       |                       |                       |
| 1890                         |                       |                       |                       |                       | -0.085<br>(0.185)     |                       | -0.076<br>(0.184)     |                       |                       |
| 1900                         |                       |                       |                       |                       | -0.196<br>(0.206)     |                       | -0.173<br>(0.204)     |                       |                       |
| 1910                         |                       |                       |                       |                       | -0.168<br>(0.197)     |                       | -0.148<br>(0.193)     |                       |                       |
| 1920                         |                       |                       |                       |                       | -0.165<br>(0.216)     |                       | -0.142<br>(0.212)     |                       |                       |
| 1930                         |                       |                       |                       |                       | 0.151<br>(0.242)      |                       | 0.206<br>(0.246)      |                       |                       |
| Country Fixed-Effects        | no                    | yes                   | yes                   |
| Mean dep. variable           | 0.579                 | 0.579                 | 0.579                 | 0.579                 | 0.579                 | 0.579                 | 0.579                 | 0.579                 | 0.579                 |
| Standard error of regression | 0.511                 | 0.512                 | 0.509                 | 0.511                 | 0.514                 | 0.511                 | 0.514                 | 0.292                 | 0.293                 |
| Log likelihood               | -96.026               | -95.441               | -95.592               | -95.895               | -94.139               | -95.356               | -93.439               | -29.525               | -29.490               |
| Left censored obs.           | 39                    | 39                    | 39                    | 39                    | 39                    | 39                    | 39                    | 39                    | 39                    |
| Left non censored obs.       | 81                    | 81                    | 81                    | 81                    | 81                    | 81                    | 81                    | 81                    | 81                    |
| Total obs.                   | 120                   | 120                   | 120                   | 120                   | 120                   | 120                   | 120                   | 120                   | 120                   |

Notes: dependent variable is total social transfers as a % of GDP. Estimation method is *tobit* regressions. The sample is composed of 21 countries and six time-benchmarks (1880, 1890, 1900, 1910, 1920, 1930). A few observations are missing. Therefore, total number of observations is 120, instead of 126. Time-dummies in columns 5 and 7 have been included for 5 of the 6 time-benchmarks in the analysis to avoid perfect multicollinearity. Robust standard errors in brackets. \*\*\* significance at 1%, \*\* significance at 5%, \* significance at 10%.

Notice that our democracy indicator is a continuous variable that ranges between -10 and 10 (where 10 is the maximum level of democracy), and that our inequality indicator is a percentage that ranges between 0 and 100 (where 100 is the maximum level of inequality). Therefore, if the predictions of the median voter models are correct, this variable should have a positive sign: the greater the inequality and the more democratic the political context, the greater the level of redistribution should be. As can be seen in column 2 of Table 2, the coefficient associated with the multiplicative variable is indeed positive. However, it is very small in absolute value and it is not significant. This suggests that the impact of inequality, even in democracy, continues to be negative. Nevertheless, the new estimation may have problems of multicollinearity between this new multiplicative variable and the democracy variable.<sup>13</sup> To test that the result obtained is robust, in column 3 of Table 2 the analysis has been repeated eliminating the democracy variable. In this new estimation the coefficient associated with the interaction between democracy and inequality maintains its positive sign and becomes significant, but it is still very small in absolute value. From Equation (3) we can calculate the total marginal effect of inequality on social transfers under democracy. According to the regression in column 3, this would be:

$$(3.1) \frac{\partial REDIST}{\partial INEQ} = -0.012 + 0.0004 \times Democracy$$

Therefore, in a situation of perfect democracy (where democracy = 10) the marginal effect of inequality would be:

$$(3.1.a) \frac{\partial REDIST}{\partial INEQ} = -0.012 + 0.0004 \times 10 = -0.008$$

while in a situation of perfect absence of democracy (where democracy = -10) the marginal effect of inequality would be:

$$(3.1.b) \frac{\partial REDIST}{\partial INEQ} = -0.012 + 0.0004 \times (-10) = -0.016$$

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<sup>13</sup> To check for the existence of multicollinearity, a VIF test was applied on the democracy variable in the regression of column 2. The value obtained is greater than 35, which confirms that there is a problem of multicollinearity (according to Greene (2003), any value above 20 is indicative of the existence of multicollinearity). In the regressions in columns 1 and 3, however, these problems do not exist. The results of the VIF tests applied (on the democracy variable in column 1 and on the interaction in column 3) in both cases produce a value close to 4, which confirms that there are no serious multicollinearity problems.

This means: 1) that inequality had a negative effect on social transfers in both democratic and non-democratic contexts, and 2) that this negative effect was more moderate in democracy. This confirms that democratic governments were more sensitive to demands for redistribution than dictatorships. However, the fact that inequality had a negative effect on the development of social policy even in democracy is a particularly interesting result with important implications. Contrary to what many studies on the origins of the welfare state appear to implicitly suggest, inequality did not favour the development of social policy even in its initial stages (when the level of social transfers was really low and social needs were therefore greater than today). However, the fact that social policy developed more easily in countries that were previously more egalitarian suggests that unequal societies were in a sort of *inequality trap*, where inequality itself was one of the main obstacles to redistribution.

Following Niskanen (1971), one might argue that once social programmes are established they have a tendency to grow by themselves (due to the aspirations of bureaucracy), giving rise to a kind of inertia effect. In other words, the growth of social transfers may be no more than the result of a simple time trend. Similarly, one might argue that the evolution of social transfers depends on shocks occurring at specific moments, such as the impact of the World War I or the *copycat effect* that may have come about after the pioneering countries introduced the first social protection measures. To test both possibilities and give more robustness to the analysis, we have repeated the previous regressions including a time trend and time fixed-effects that should capture the influence of specific shocks. As is shown in columns 4 to 7 in Table 2, neither the annual dummies nor the time trends are statistically significant. The rest of variables maintain the expected sign and very similar levels of significance, which confirms the previous results.

Finally, the evolution of social transfers between 1880 and 1930 might be also determined, to some extent, by specific country characteristics. Although the *tobit* estimations with country fixed-effects could be inconsistent and biased –and therefore the results should be interpreted with caution<sup>14</sup>– to give more robustness to the analysis we repeated the previous estimations including country fixed-effects. As is shown in columns 8 and 9 of Table 2, the results are similar to the previous ones. All

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<sup>14</sup> Although it is normal to consider that the maximum likelihood estimators in non-linear panel data models with fixed effects are biased and inconsistent, Greene (2004) maintains that the *tobit* estimators are unaffected by this problem. Thus the coefficients of the estimation are not biased, although the disturbance variation is, and this bias could be transmitted into the calculation of marginal effects.

the variables maintain the expected sign, but democracy and the percentage of population over 65 lose significance.

### *B. Top income shares as an indicator of inequality*

In order to corroborate the previous results, I have repeated the above analysis using the *top income shares* as an indicator of inequality (Table 3). However, the information available in this case is much more limited. There are only 39 observations involving 13 countries (Australia, Canada, Finland, France, Japan, The Netherlands, New Zealand, Norway, Sweden, the United Kingdom, the United States, Portugal and Argentina). The years available vary from country to country, although in most cases they are from the early decades of the 20th century.<sup>15</sup> The estimation method is least squares,<sup>16</sup> and given the scant number of observations, I have used country random-effects instead of country fixed-effects, because the latter would have been very costly in terms of losing degrees of freedom. The Hausman test was applied and no evidence was found for rejecting the random-effects model. Finally, just as before, we also checked for time effects, introducing a time trend and time-dummies (columns 4 to 7).

In general the results are very similar to those obtained with the percentage of non-family farms. Both the log of GDP and the ageing of population had a positive effect, although when time-effects are included they tend to lose significance. Democracy also maintains its positive sign, but is not significant in any of the new regressions. As far as the *top income shares* variable is concerned, the results again confirm that inequality had a negative impact on social transfers regardless of whether we test for time effects or not (columns 1, 4 and 5).

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<sup>15</sup> Table A.3 in the appendix shows the figures on *top incomes* that have been used in the regression analysis.

<sup>16</sup> Instead of a *tobit* model, the least squares method was used because there is now a single censored observation.

**Table 3. The determinants of total social transfers as a % of GDP, 1880-1930 (II)**

|                                     | (1)       | (2)      | (3)       | (4)        | (5)      | (6)        | (7)       |
|-------------------------------------|-----------|----------|-----------|------------|----------|------------|-----------|
| C                                   | -4.745 *  | -5.051 * | -4.733 *  | -6.097     | -4.531   | -6.061     | -4.553    |
|                                     | (2.767)   | (2.929)  | (2.622)   | (4.193)    | (4.028)  | (3.944)    | (3.739)   |
| Log(GDP per cap)                    | 0.689 **  | 0.756 *  | 0.690 **  | 0.877      | 0.753    | 0.875 *    | 0.770     |
|                                     | (0.317)   | (0.393)  | (0.287)   | (0.527)    | (0.506)  | (0.484)    | (0.459)   |
| Elderly                             | 0.172 **  | 0.174 ** | 0.171 **  | 0.183 **   | 0.096    | 0.180 **   | 0.102     |
|                                     | (0.083)   | (0.086)  | (0.082)   | (0.088)    | (0.102)  | (0.087)    | (0.099)   |
| Democracy                           | 0.002     | -0.034   |           | 0.000      | 0.018    |            |           |
|                                     | (0.021)   | (0.112)  |           | (0.021)    | (0.023)  |            |           |
| <i>Top incomes</i> (0.1%)           | -0.136 ** | -0.167   | -0.138 ** | -0.143 *** | -0.129 * | -0.143 *** | -0.147 ** |
|                                     | (0.053)   | (0.112)  | (0.053)   | (0.052)    | (0.068)  | (0.050)    | (0.059)   |
| <i>Top incomes</i> (0.1%)*democracy |           | 0.005    | 0.0004    |            |          | 0.0003     | 0.002     |
|                                     |           | (0.013)  | (0.003)   |            |          | (0.003)    | (0.003)   |
| Time-trend                          |           |          |           | -0.047     |          | -0.048     |           |
|                                     |           |          |           | (0.077)    |          | (0.075)    |           |
| 1890                                |           |          |           |            | -0.312   |            | -0.333    |
|                                     |           |          |           |            | (0.211)  |            | (0.208)   |
| 1900                                |           |          |           |            | -0.325   |            | -0.334    |
|                                     |           |          |           |            | (0.218)  |            | (0.224)   |
| 1910                                |           |          |           |            | -0.305   |            | -0.319    |
|                                     |           |          |           |            | (0.271)  |            | (0.278)   |
| 1920                                |           |          |           |            | -0.657 * |            | -0.673 *  |
|                                     |           |          |           |            | (0.333)  |            | (0.336)   |
| 1930                                |           |          |           |            | -0.289   |            | -0.313    |
|                                     |           |          |           |            | (0.386)  |            | (0.373)   |
| Adjusted-R2                         | 0.399     | 0.386    | 0.399     | 0.390      | 0.458    | 0.390      | 0.457     |
| Standard error of regression        | 0.387     | 0.384    | 0.386     | 0.382      | 0.347    | 0.381      | 0.350     |
| DW                                  | 2.098     | 2.122    | 2.107     | 2.203      | 2.130    | 2.217      | 2.067     |
| Obs.                                | 39        | 39       | 39        | 39         | 39       | 39         | 39        |

Notes: dependent variable is total social transfers as a % of GDP. Estimation method is least squares with country random-effects. The sample is composed of 13 countries and six time-benchmarks (1880, 1890, 1900, 1910, 1920, 1930) conforming an unbalanced panel dataset. Robust standard errors in brackets. \*\*\* significance at 1%, \*\* significance at 5%, \* significance at 10%.

As in the case of non-family farms, we wanted to check whether the effect of inequality is different in democratic contexts. In order to do this, we added the interaction between inequality and democracy in column 2. As expected the coefficient sign is positive, but is very small in absolute value and not significant, which suggest that inequality's effect is still negative in democratic contexts. However, it seems that this new regression is affected by multicollinearity problems.<sup>17</sup> For this reason I repeated the estimation eliminating the democracy variable from the regression. As is shown in columns 3, 6 and 7, inequality had a negative effect on social transfers since the coefficient associated with the *top income shares* variable is negative and highly significant, regardless of whether or not we check for time-effects. The coefficient

<sup>17</sup> To check for the existence of multicollinearity, a VIF test was applied on the democracy variable in the regression in column 2. The value obtained is greater than 60, which indicates that there are problems of multicollinearity. In columns 1 and 3, however, there is no multicollinearity. In both cases the value obtained by applying the VIF tests (on the democracy variable in column 1 and the interaction in column 3) is less than 2, which confirms the absence of multicollinearity.

associated with the multiplicative variable, however, is positive but very small in absolute value. As was seen in the case of non-family farms, this would indicate that the negative effect of inequality is smaller in democracy, although this variable is not statistically significant.

### C. Impact of inequality on social transfers by programme

If the *social transfers* are analysed by programme, the results are not very different from those obtained in the previous sections. However, a number of interesting extra details can be found. As can be seen in Table 4, inequality had a negative impact on the different types of spending. However, it appears that GDP per capita had almost no positive influence on welfare spending, since it is significant in only 1 of the 4 regressions where spending on welfare is the endogenous variable. It would also appear that democracy favoured growth in health and pensions expenditures, but had no significant effect on welfare spending. This suggests that traditional welfare was the predominant form of social protection in the least developed and least democratic countries.

**Table 4a. The determinants of social transfers by program, 1880-1930**

| dep. var.                    | Pensions<br>(1)       | Health<br>(2)         | Welfare<br>(3)       | Pensions<br>(4)     | Health<br>(5)          | Welfare<br>(6)       |
|------------------------------|-----------------------|-----------------------|----------------------|---------------------|------------------------|----------------------|
| C                            | -6.239 ***<br>(1.225) | -1.752 ***<br>(0.578) | -1.609 **<br>(0.680) | -1.339<br>(0.826)   | -1.430<br>(1.289)      | -2.004<br>(1.619)    |
| Log(GDP per cap)             | 0.724 ***<br>(0.154)  | 0.194 ***<br>(0.072)  | 0.134 *<br>(0.073)   | 0.212 **<br>(0.089) | 0.259 *<br>(0.149)     | 0.217<br>(0.186)     |
| Elderly                      | 0.118 ***<br>(0.031)  | 0.071 ***<br>(0.017)  | 0.177 ***<br>(0.024) | 0.016<br>(0.045)    | 0.017<br>(0.035)       | 0.142 ***<br>(0.045) |
| Democracy                    | 0.012<br>(0.010)      | 0.0219 ***<br>(0.006) | 0.002<br>(0.007)     | 0.016 *<br>(0.008)  | -0.001<br>(0.010)      | -0.012<br>(0.012)    |
| Non-family farms             | -0.007 ***<br>(0.003) | -0.003 **<br>(0.002)  | -0.004 *<br>(0.002)  |                     |                        |                      |
| <i>Top incomes</i> (0.1%)    |                       |                       |                      | -0.046 *<br>(0.023) | -0.0689 ***<br>(0.022) | -0.020<br>(0.033)    |
| Adjusted-R2                  |                       |                       |                      | 0.431               | 0.300                  | 0.121                |
| DW                           |                       |                       |                      | 1.752               | 1.927                  | 2.184                |
| Standard error of regression | 0.194                 | 0.216                 | 0.274                | 0.154               | 0.177                  | 0.216                |
| Log likelihood               | -37.989               | -41.184               | -48.352              |                     |                        |                      |
| Left censored obs.           | 80                    | 53                    | 43                   |                     |                        |                      |
| Left non censored obs.       | 40                    | 67                    | 77                   |                     |                        |                      |
| Total obs.                   | 120                   | 120                   | 120                  | 39                  | 39                     | 39                   |

Notes: sample and estimation method in columns 1 to 3 are the same as in table 2. In columns 4 to 6 are the same as in table 3.

**Table 4b. The determinants of social transfers by program, 1880-1930**

| dep. var.                        | Pensions<br>(1)       | Health<br>(2)          | Welfare<br>(3)       | Pensions<br>(4)       | Health<br>(5)         | Welfare<br>(6)       |
|----------------------------------|-----------------------|------------------------|----------------------|-----------------------|-----------------------|----------------------|
| C                                | -5.977 ***<br>(1.198) | -1.567 ***<br>(0.591)  | -1.464 **<br>(0.668) | -1.393 *<br>(0.807)   | -1.456<br>(1.225)     | -1.885<br>(1.533)    |
| Log(GDP per cap)                 | 0.702 ***<br>(0.147)  | 0.192 ***<br>(0.071)   | 0.116<br>(0.071)     | 0.232 ***<br>(0.085)  | 0.261 *<br>(0.135)    | 0.193<br>(0.169)     |
| Elderly                          | 0.115 ***<br>(0.031)  | 0.067 ***<br>(0.017)   | 0.176 ***<br>(0.024) | 0.018<br>(0.045)      | 0.017<br>(0.035)      | 0.139 ***<br>(0.045) |
| Non-family farms                 | -0.009 ***<br>(0.002) | -0.005 ***<br>(0.002)  | -0.005 **<br>(0.002) |                       |                       |                      |
| Non-family farms*democ.          | 0.0003 *<br>(0.0002)  | 0.0004 ***<br>(0.0001) | 0.0001<br>(0.0001)   |                       |                       |                      |
| <i>Top incomes (0.1%)</i>        |                       |                        |                      | -0.060 ***<br>(0.022) | -0.067 ***<br>(0.023) | -0.009<br>(0.031)    |
| <i>Top incomes (0.1%)*democ.</i> |                       |                        |                      | 0.002 *<br>(0.001)    | 0.0002<br>(0.001)     | -0.001<br>(0.001)    |
| Adjusted-R2                      |                       |                        |                      | 0.432                 | 0.301                 | 0.115                |
| DW                               |                       |                        |                      | 1.734                 | 1.936                 | 2.202                |
| Standard error of regression     | 0.194                 | 0.216                  | 0.275                | 0.154                 | 0.177                 | 0.218                |
| Log likelihood                   | -37.328               | -39.862                | -48.047              |                       |                       |                      |
| Left censored obs.               | 80                    | 53                     | 43                   |                       |                       |                      |
| Left non censored obs.           | 40                    | 67                     | 77                   |                       |                       |                      |
| Total obs.                       | 120                   | 120                    | 120                  | 39                    | 39                    | 39                   |

Notes: see table 4a.

## 5. The determinants of social spending in 1930-33

As was seen earlier, in many countries the rise of the welfare state was closely linked to the development of social insurances. The aim of this section is to analyse whether the negative effect of inequality is maintained when we include social insurance provisions in the analysis. Therefore, the new estimation of *social spending* presented in Section 3 has been used as the endogenous variable for the analysis. The estimation method is least squares and, given the low number of observations (44 in total), it was considered best to include random effects instead of fixed effects since the latter would be very costly in terms of losing degrees of freedom. Also, some explanatory variables take the same value in 1930 as in 1933 because the information is only available for every 10 years or covers various years, and they therefore act as a *quasi* fixed-effect.

The explanatory variables are practically the same as in the previous section. The *percentage of non-family farms*<sup>18</sup> and *top income shares* are once again used as

<sup>18</sup> In the Soviet Union the percentage of non-family farms takes value zero. In the 1930s, non-family farms basically belonged to the State and therefore they are not a good indicator of inequality or of the political

proxies of inequality. The percentage of population over 65 has been used to capture the effect of the ageing of population. The data come from Lindert's website, except in the case of Bulgaria, Czechoslovakia, Hungary, Ireland, Poland, the Soviet Union and Yugoslavia, for which they have been taken from Mitchell (1998). The polity2 index from the Polity IV Project has again been used to measure the degree of democratization. In order to avoid possible distortions brought about by the impact of the Great Depression, instead of GDP per capita I have included the percentage of the working population in agriculture, which is a more stable indicator of economic development. The information comes from Mitchell (1998), except for the USSR and Spain, for which it has been taken from Allen (2003) and Nicolau (2005) respectively. Finally, in order to capture the effect of the economic cycle and, especially, to account for the impact of the Great Depression, the rate of economic growth during the previous five years (taken from Maddison) has also been included in the estimation.

**Table 5. The determinants of total social spending as a % of GDP, 1930-33**

|                                     | (1)                   | (2)                   | (3)                   | (4)                   | (5)                   | (6)                   |
|-------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| C                                   | 3.014<br>(2.325)      | 2.799<br>(2.249)      | 2.609<br>(2.262)      | 5.281<br>(4.704)      | -8.280<br>(6.128)     | 5.528<br>(4.505)      |
| Agriculture population (%)          | -0.054 **<br>(0.022)  | -0.058 **<br>(0.023)  | -0.048 **<br>(0.019)  | -0.071<br>(0.057)     | -0.094<br>(0.073)     | -0.076<br>(0.058)     |
| GDP growth rate (5 years)           | -0.230 ***<br>(0.081) | -0.224 ***<br>(0.079) | -0.232 ***<br>(0.080) | -0.236 ***<br>(0.078) | -0.198 ***<br>(0.053) | -0.227 ***<br>(0.078) |
| Elderly                             | 0.633 ***<br>(0.199)  | 0.674 ***<br>(0.210)  | 0.623 ***<br>(0.198)  | 0.868<br>(0.528)      | 1.937 ***<br>(0.623)  | 0.859<br>(0.519)      |
| Democracy                           | 0.011<br>(0.028)      | -0.096<br>(0.103)     |                       | -0.001<br>(0.065)     | 0.907 ***<br>(0.267)  |                       |
| Non family farms                    | -0.042 ***<br>(0.010) | -0.039 ***<br>(0.010) | -0.038 ***<br>(0.011) |                       |                       |                       |
| Non family farms *democracy         |                       | 0.002<br>(0.002)      | 0.001<br>(0.001)      |                       |                       |                       |
| <i>Top incomes</i> (0.1%)           |                       |                       |                       | -0.919 **<br>(0.325)  | 0.657<br>(0.565)      | -0.893 **<br>(0.329)  |
| <i>Top incomes</i> (0.1%)*democracy |                       |                       |                       |                       | -0.221 ***<br>(0.067) | -0.005<br>(0.016)     |
| Adjusted R-squared                  | 0.677                 | 0.684                 | 0.685                 | 0.562                 | 0.783                 | 0.565                 |
| S.E. of regression                  | 0.908                 | 0.915                 | 0.911                 | 0.702                 | 0.447                 | 0.700                 |
| DW                                  | 2.030                 | 2.074                 | 2.021                 | 2.082                 | 2.069                 | 2.117                 |
| Obs.                                | 44                    | 44                    | 44                    | 24                    | 24                    | 24                    |

Notes: dependent variable is total social spending as a % of GDP. Estimation method is least squares with country random effects. In regressions 1 to 3, the sample is composed of 22 countries and two years (1930 and 1933), which sums 44 observations. In regressions 4 to 6, only 12 countries are included because the information on top incomes is much more limited. A dummy variable for Germany is included in regressions 1 to 3. According to the quartiles method that country is an outlier. Its levels of social spending in 1930 and 1933 are out of the range  $[Q_1 - k(Q_3 - Q_1), Q_3 + k(Q_3 - Q_1)]$  where  $k=1,5$  and  $Q_1$  and  $Q_3$  are the first and the last inter-quartiles respectively. Robust standard errors in brackets. \*\*\* significance at 1%, \*\* significance at 5%, \* significance at 10%.

influence of upper-income groups. In fact the political conditions in this country in the 1930s would make likely to assume that rural landowners had no political power and that the agrarian reform of 1917 and the subsequent collectivization brought about a radical decrease in inequality.

As in the analysis of *social transfers*, firstly I estimated a model only with inequality and control variables (columns 1 and 4 of Table 5), and then I added the interaction between democracy and inequality (columns 2, 3, 5 and 6). As can be seen in Table 5, both the coefficient of the percentage of the working population in agriculture and the coefficient of percentage of population over 65 have the expected sign (negative and positively respectively). This means that economic development and the ageing of population had a positive effect on social spending (although this is not significant in all the regressions). The growth rate of GDP per capita over the previous five years, however, is highly significant and has a negative sign, which indicates that *social spending* had a counter-cyclical behaviour, as would be expected in the context of the Great Depression.

The econometric results also confirm that inequality had a negative impact on the level of *social spending* when social insurances benefits are included in the analysis. Both the *percentage of non-family farms* and the *top income shares* have a negative sign and are significant in almost all the regressions (the only exception being the regression in column 5, but everything indicates that it has problems of multicollinearity).<sup>19</sup> However, neither the variable democracy nor the interaction between inequality and democracy are significant in the regressions. Nonetheless, it should not be concluded that there were no differences in social spending levels between democracies and dictatorships during this period. As is shown next, the impact of democracy varied from one social programme to another.

Table 6 shows the results of the analysis of *social spending* programme by programme. Table 6a shows the results of estimating a model only with the variable inequality and control variables, while Table 6b shows the results of estimating a model adding the interaction between democracy and inequality. As expected, it seems that the percentage of the working population in agriculture had a negative impact, which confirms that economic development had a positive effect (although it is not significant in all the regressions). The ageing of population had a positive and significant effect on pensions; and the GDP growth rate has a negative and significant sign, which suggests that social spending was counter-cycle.

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<sup>19</sup> This is suggested by the change of sign in the *top income shares* variable and in the interaction of that variable with democracy. To confirm whether multicollinearity exists, a VIF test was applied on the democracy variable. The result of this was a value in excess of 30, which confirms the existence of multicollinearity. In the other equations, however, the VIF tests applied indicate that there is no multicollinearity.

**Table 6a. The determinants of social spending by program, 1930-33**

|                            | Pensions<br>(1)       | Health<br>(2)        | Welfare<br>(3)        | Pensions<br>(4)      | Health<br>(5)       | Welfare<br>(6)        |
|----------------------------|-----------------------|----------------------|-----------------------|----------------------|---------------------|-----------------------|
| C                          | 1.113<br>(0.775)      | 0.173<br>(1.065)     | 1,962<br>(1,486)      | 0.471<br>(1.244)     | 0.161<br>(1.093)    | 5,243 *<br>(3,059)    |
| Agriculture population (%) | -0.023 ***<br>(0.008) | 0.003<br>(0.008)     | -0,032 **<br>(0,015)  | -0.027 *<br>(0.015)  | -0.003<br>(0.013)   | -0,041<br>(0,035)     |
| GDP growth rate (5 years)  | -0.057 **<br>(0.022)  | -0.020<br>(0.016)    | -0,130 ***<br>(0,052) | -0.049 **<br>(0.023) | -0.013<br>(0.020)   | -0,175 **<br>(0,069)  |
| Elderly                    | 0.231 ***<br>(0.062)  | 0.114<br>(0.094)     | 0,208<br>(0,134)      | 0.241 *<br>(0.137)   | 0.194<br>(0.121)    | 0,296<br>(0,330)      |
| Democracy                  | 0.002<br>(0.009)      | 0.036 ***<br>(0.011) | -0,007<br>(0,023)     | 0.001<br>(0.019)     | 0.038 **<br>(0.016) | -0,058<br>(0,054)     |
| Non family farms           | -0.015 ***<br>(0.004) | -0.009<br>(0.007)    | -0,015 ***<br>(0,005) |                      |                     |                       |
| <i>Top incomes</i> (0.1%)  |                       |                      |                       | 0.008<br>(0.093)     | -0.145 *<br>(0.080) | -0,689 ***<br>(0,262) |
| Adjusted R-squared         | 0.620                 | 0.303                | 0,645                 | 0.301                | 0.252               | 0,590                 |
| S.E. of regression         | 0.352                 | 0.162                | 0,726                 | 0.216                | 0.183               | 0,652                 |
| DW                         | 2.094                 | 2.231                | 1,992                 | 1.621                | 1.571               | 2,347                 |
| Obs.                       | 44                    | 44                   | 44                    | 24                   | 24                  | 24                    |

Notes: see table 5. Unemp.=unemployment. TI=*Top incomes*.**Table 6b. The determinants of social spending by program, 1930-33**

|                            | Pensions<br>(1)       | Health<br>(2)          | Welfare<br>(3)        | Pensions<br>(4)      | Health<br>(5)        | Welfare<br>(6)       |
|----------------------------|-----------------------|------------------------|-----------------------|----------------------|----------------------|----------------------|
| C                          | 1.004<br>(0.785)      | 0.120<br>(0.997)       | 1,798<br>(1,470)      | 0.459<br>(1.214)     | 0.616<br>(1.079)     | 4,669<br>(2,957)     |
| Agriculture population (%) | -0.021 ***<br>(0.008) | 0.002<br>(0.007)       | -0,029 **<br>(0,013)  | -0.026 *<br>(0.015)  | -0.002<br>(0.014)    | -0,046<br>(0,036)    |
| GDP growth rate (5 years)  | -0.058 **<br>(0.022)  | -0.017<br>(0.015)      | -0,132 ***<br>(0,052) | -0.050 **<br>(0.023) | -0.011<br>(0.020)    | -0,171 **<br>(0,067) |
| Elderly                    | 0.228 ***<br>(0.063)  | 0.126<br>(0.091)       | 0,197<br>(0,132)      | 0.239 *<br>(0.138)   | 0.169<br>(0.122)     | 0,344<br>(0,332)     |
| Non family farms           | -0.014 ***<br>(0.005) | -0.008<br>(0.006)      | -0,014 **<br>(0,006)  |                      |                      |                      |
| Non fam. farm*democracy    | 0.0002<br>(0.0002)    | 0.0007 ***<br>(0.0002) | 0,0001<br>(0,0004)    |                      |                      |                      |
| <i>Top income</i> (0.1%)   |                       |                        |                       | 0.008<br>(0.095)     | -0.208 **<br>(0.085) | -0,586 **<br>(0,264) |
| <i>TI</i> (0.1%)*democracy |                       |                        |                       | 0.001<br>(0.004)     | 0.008 **<br>(0.004)  | -0,016<br>(0,012)    |
| Adjusted R-squared         | 0.625                 | 0.321                  | 0,587                 | 0.303                | 0.206                | 0,492                |
| S.E. of regression         | 0.352                 | 0.163                  | 0,728                 | 0.210                | 0.191                | 0,638                |
| DW                         | 2.094                 | 2.282                  | 2,003                 | 1.705                | 1.646                | 2,300                |
| Obs.                       | 44                    | 44                     | 44                    | 24                   | 24                   | 24                   |

Notes: see table 6a.

As for the political variables, Table 6 shows that democracy's effect varies from type to type of social spending. Nonetheless, as we found in the analysis of social transfers, it seems that democracy stimulated to a bigger extent the development of more modern and redistributive forms of social protection such as health-care. Finally, the coefficient associated to the inequality variables (*non family farms* and the *top income shares*) has a negative sign in almost all regressions (the only exception is column 4 in both tables). However, it is hard to find a clear pattern in the relationship between inequality and our different types of social spending. In the regressions where we use the percentage of non family farms as a proxy of inequality, it is significant in the cases of pensions and welfare. In contrast, in the regressions where we use the top income shares as a proxy of inequality, it is significant in the cases of health and welfare. I do not have a clear explanation for that, but, in general, it seems that inequality's effect on social spending is also negative when specific social programmes are analyzed.

## **6. Implications for the political regime**

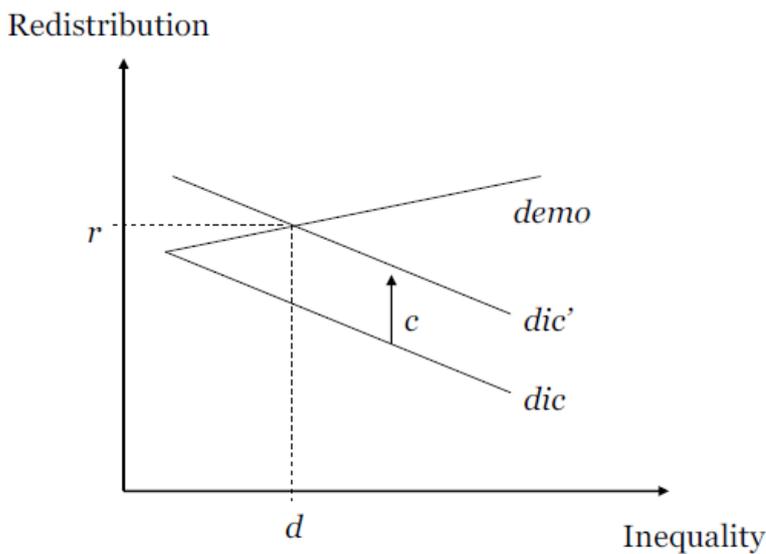
The findings of the previous sections seem to suggest that, between 1880 and 1930-33, inequality had a rather negative influence on the development of social policy, regardless of whether we use *social transfers* or *social spending* as an indicator of redistribution, and regardless of whether we use the *percentage of non-family farms* or *top income shares* as an indicator of inequality. This has some important implications for both economic growth and the political regime determinants. According to Alesina and Rodrik (1994) and Persson and Tabellini (1994) inequality is harmful to economic growth because it leads to higher redistribution and taxation. However, if our results are correct, these theories fail to identify the mechanisms through which inequality hampers economic growth (because inequality does not appear to result in higher redistribution, but the opposite). In fact, there are a number of theories proposing alternative channels to explain why inequality is bad for economic growth. Bénabou (1996), for example, considers that, if there are market failures, inequality hampers human capital accumulation and, therefore, economic growth. Perotti (1996), however, suggests that inequality stimulates political violence, which, in turn, discourages investment. And Keefer and Knack (2002) maintain that inequality increases political polarization, provoking uncertainty on the protection of property rights and discouraging investment.

Our results also have implications for the political regime. From Boix (2003) y Engerman and Sokoloff (2002, 2005), we can derive that inequality hinders the consolidation of democracy. In line with median voter models, Boix (2003) assumes that, in democratic contexts, inequality leads to higher redistribution. Consequently, if there is much inequality, the upper-income groups will be more willing to support autocratic governments to stop redistribution. In contrast, if there is not much inequality, then redistribution will be more moderate and democracy more stable. Similarly, Engerman and Sokoloff (2002, 2005) maintain that, in the New World, social elites tended to establish non-democratic institutions in order to protect their privileges. As a result, societies with high levels of inequality had more difficulties in developing democratic institutions.

However, this paper's results indicate that inequality, far from favouring redistribution, hindered the development of social policy. This raises an interesting question: if redistribution does not increase with inequality (not even in democracy), why do social elites need to support autocratic governments when inequality is high? The answer is straightforward. We do not need the relationship between inequality and redistribution to be positive in democracy for the economic elites to be willing to support autocratic governments. We just need that, for a given level of inequality, the level of redistribution is lower under non-democratic governments.

**Figure 2.**

**Inequality, redistribution and political regime (I): Boix (2003) hypothesis**



The simplest way of demonstrating this is with a diagram. Figure 2 represents the Boix (2003) hypothesis.<sup>20</sup> The *demo* curve indicates that, in democracy, the relationship between inequality and redistribution is positive. The *dic* curve indicates that, under dictatorship, that relationship is negative.<sup>21</sup> Therefore, the level of redistribution will always be higher in democracy (for any given level of inequality). According to Boix (2003), when the cost of redistribution exceeds a certain limit, the upper-income groups will be interested in supporting autocratic governments.<sup>22</sup> Given that the level of redistribution under dictatorship is always lower than in democracy, in order for allow democracy to exist (and for the upper-income groups not to always prefer dictatorship for any level of inequality), the simplest thing is to assume that dictatorship represents a cost in itself, for example the economic cost of repression.<sup>23</sup> For simplicity we can assume that the cost of dictatorship is constant for any level of redistribution, which is equivalent to an upward shift of the *dic* curve in the diagram (where the distance  $c$  indicates the cost of maintaining the dictatorship). Therefore, as long as the level of inequality is located below  $d$ , democracy will be viable, but from this point onwards the upper-income groups will support non-democratic governments so as to avoid redistribution.

Figure 3 shows the situation in which the relationship between inequality and redistribution is negative in both dictatorships and democracies. According to the previous econometric results (see Equations 3.1.a and 3.1.b), it has been assumed that the slope of the curve that relates inequality and redistribution is more negative in the case of dictatorships (see the *dic* and *demo* curves in Figure 3). This means that the ability of the lower-income groups (or in a wider sense, those groups in favour of redistribution) to impose redistribution is greater in democratic contexts. However, even in democracies, the relationship between inequality and redistribution will continue to be negative (which, actually, simply means that the levels of redistribution in an egalitarian democracy will be greater than in a democracy with much inequality).

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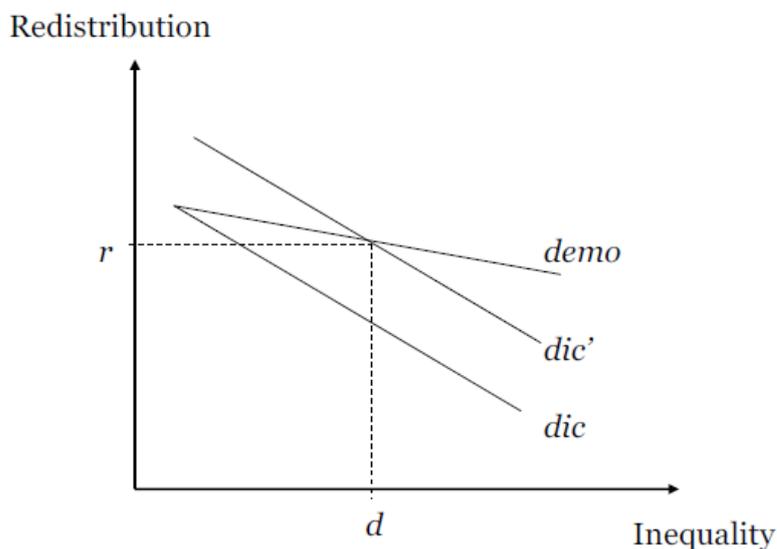
<sup>20</sup> Boix (2003)'s model not do not just focus on the role of fiscal redistribution when explaining the relationship between inequality and democracy/dictatorship. It also considers other factors such as the predominance of fixed assets in the economy, which according to Boix (2003) can be easily expropriated and constitute an additional source of political instability for democracies. However, this does not affect the argument developed in the text.

<sup>21</sup> In fact the relationship between inequality and redistribution does not need to be negative. It could be constant at a level set by the dictator. What according to Boix (2003)'s hypothesis is really necessary is that the level of redistribution under dictatorship is always below the level of redistribution in democracy.

<sup>22</sup> For simplicity we can assume that the cost of the redistribution in democracy is equivalent to redistribution itself, which is true if the State budget is kept balanced.

<sup>23</sup> It could also be considered that dictatorship implies moral or ideological costs. If democracy is considered as a good in itself, then simply the fact of being under the orders of a dictator already implies a cost. Therefore, the upper-income groups would be willing to accept certain levels of redistribution in order to live in a democracy.

**Figure 3. Inequality, redistribution and political regime (II)**



As in the previous case, we can assume that the fact that a dictatorship exists implies a cost which is equivalent to an upward shift of the *dic* curve until it is located at *dic'* (Figure 3). It can easily be seen in the diagram that, from point *d* onwards, the wealthiest sectors of society will have the incentive to support autocratic regimes because the cost of maintaining the dictatorship plus the cost of redistribution under dictatorship will be lower than the cost of redistribution in democracy. In other words, we do not need the relationship between inequality and redistribution to be positive in democracy for the upper-income groups to have the incentive to support autocratic regimes. We just need the slope of the curve in democracy to be less negative than under dictatorship.

The final result obtained is not very different from that of Boix (2003) in the sense that, in both cases, democracy will be more unstable if inequality is very high. However, there is one very important difference. According to the Boix's hypothesis, coups d'état will occur when redistribution levels are high (see Figure 2, redistribution at point *d* is higher than at any of the points to its left, in which democracy is viable) whereas, according to our results, coups d'état will occur when redistribution levels are lower, and not higher, than at any of the points in which the democracy is viable (see Figure 3). This fits in with the situation that seems to be more frequent in real life,

where stable democracies enjoy high levels of redistribution while many coups d'état occur in countries with high levels of inequality and little redistribution.

The line of reasoning based on Figure 3 should in no way be interpreted as an attempt to formulate a model of the determinants of democracy. Boix (2003) himself mentions a whole series of variables that have not been considered here, such as international capital mobility, the weight of agrarian incomes in the economy, human capital, etc. Neither have been taken into account political variables, such as the relationship between inequality and social polarization (which according to Keefer and Knack (2002) helps to explain why inequality is harmful to economic growth), or the capacity of the different groups involved in the fight for redistribution to organize themselves politically and act as a pressure group (Acemoglu *et al.*, 2005). The aim of this section was simply to show that we do not need the relationship between inequality and redistribution to be positive in democracy for economic elites to have the incentives to support autocratic regimes.

## 7. Conclusions

It is often assumed that the fight against inequality played an important role during the early stages of the Welfare State. However, not many studies have tested this hypothesis from a quantitative and comparative perspective. In this paper, the impact of inequality on social policy between 1880 and 1930 has been analyzed, by using two alternative indicators of redistribution -*social transfers* and *social spending*- and two alternative proxies for inequality -the percentage of non-family farms and the top income shares-. Although it might look counter-intuitive, the econometric outcomes show that inequality did not favour the development of social policy even in its early stages. Curiously, more egalitarian countries were also pioneers in the rise of the Welfare State. Somehow, this means that unequal societies were in a sort of *inequality trap*, where inequality itself was one of the main obstacles to redistribution.

There are at least three theoretical arguments to explain this apparent paradox. 1) In the median voter theories it is assumed that redistribution implies dead-weight losses. However, if there are market failures, as Bénabou (2000, 2004) stresses, then redistribution can lead to efficiency gains, which (if inequality is low enough) can compensate for the cost of redistribution. Instead, as inequality rises, so does the number of individuals rich enough not to be compensated for the cost of redistribution.

Therefore, political support for redistribution will diminish. 2) In the median voter theories it is also assumed that, in democracy, political power is equally distributed, as all the citizens have the right to vote, and all the votes are worth the same. However, according to a number of recent studies, power and political influence depend on individuals' income level. This means that if inequality increases then the political power of the well-off will be also reinforced, so they will be able to stop redistribution more easily. 3) Finally, it also looks plausible to consider, as Lindert (2004) does, that political support for redistribution does not depend on the gap between the median voter income and the average income, but on the gap between the median-income groups (who are decisive in the elections) and the lower-income groups. The closer is the distance between these two groups and the more the median-income groups believe that they can become beneficiaries of social policy, the larger the political support for redistribution.

Our results have also relevant implications. On the one hand, they confirm that if inequality is harmful for economic growth it is not because redistribution is higher in unequal countries -as Alesina and Rodrik, (1994) and Persson and Tabellini, (1994) suggested-. In fact, there are a number of alternative theories which explain why inequality is bad for economic growth. Bénabou (1996), for example, considers that inequality may hamper human capital accumulation and, therefore, economic growth. Perotti (1996) suggests that inequality stimulates political violence, which, in turn, disincentives investment; and Keefer and Knack (2002) hold that inequality leads to political polarization, which causes increasing uncertainty on property rights and discourages investment. On the other hand, the results of this paper have also implications on the determinants of the political regime. Although it might look paradoxical at a first glance, we do not need inequality to have a positive impact on redistribution for the economic elites to have incentives to support authoritarian governments in order to avoid redistribution. We just need the cost of redistribution under dictatorship (plus the cost of maintaining the dictatorship) to be lower than in democracy (which is not incompatible with the fact that egalitarian democracies redistribute more than non-egalitarian democracies).

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## Appendix

**Table A.1. Social transfers (as a % of GDP), 1880-1930**

|                | 1880 | 1890 | 1900 | 1910 | 1920 | 1930 |
|----------------|------|------|------|------|------|------|
| Argentina      | 0    | 0    | 0    | 0    | 0    | 0    |
| Australia      | 0    | 0    | 0    | 1.12 | 1.66 | 2.11 |
| Austria        | 0    | 0    | 0    | 0    | 0    | 1.43 |
| Belgium        | 0.17 | 0.22 | 0.26 | 0.43 | 0.52 | 0.56 |
| Brazil         | 0    | 0    | 0    | 0    | 0    | 0    |
| Canada         | 0    | 0    | 0    | 0    | 0.06 | 0.31 |
| Denmark        | 0.96 | 1.11 | 1.41 | 1.75 | 2.71 | 3.11 |
| Finland        | 0.66 | 0.76 | 0.78 | 0.9  | 0.85 | 2.97 |
| France         | 0.46 | 0.54 | 0.57 | 0.81 | 0.64 | 1.05 |
| Greece         | 0    | 0    | 0    | 0    | 0    | 0.07 |
| Italy          | 0    | 0    | 0    | 0    | 0    | 0.08 |
| Japan          | 0.05 | 0.11 | 0.17 | 0.18 | 0.18 | 0.21 |
| Mexico         | 0    | 0    | 0    | 0    | 0    | 0    |
| Netherlands    | 0.29 | 0.3  | 0.39 | 0.39 | 0.99 | 1.03 |
| New Zealand    | 0.17 | 0.39 | 1.09 | 1.35 | 1.84 | 2.43 |
| Norway         | 1.07 | 0.95 | 1.24 | 1.18 | 1.09 | 2.39 |
| Portugal       | 0    | 0.12 | 0.1  | 0.09 | 0.42 | 0.35 |
| Spain          | 0.36 | 0.43 | 0.36 | 0.33 | 0.27 | 0.49 |
| Sweden         | 0.72 | 0.85 | 0.85 | 1.03 | 1.14 | 2.59 |
| United Kingdom | 0.86 | 0.83 | 1    | 1.38 | 1.39 | 2.32 |
| United States  | 0.29 | 0.45 | 0.55 | 0.56 | 0.7  | 0.56 |

Sources: Lindert website database. For more details see text. Figures on Portugal come from Valerio (2001) and Spanish figures are my own. The estimates fit Lindert's definitions. In the case of Spain social transfers have been estimated from public budget sources and the Spanish Statistical Yearbooks. Portuguese figures have been taken from Valerio (2001). Since his estimates only include public administrations' spending, his figures fit with Lindert's definitions.

**Table A.2. Social spending (as a % of GDP), 1930 and 1933**

|                | 1930  | 1933  |
|----------------|-------|-------|
| Australia      | 5.79  | 6.17  |
| Belgium        | 1.83  | 5.85  |
| Bulgaria       | 0.14  | 0.17  |
| Canada         | 0.68  | 2.15  |
| Czechoslovakia | 2.91  | 4.72  |
| Denmark        | 4.8   | 6.32  |
| Finland        | 2.11  | 2.57  |
| France         | 2.49  | 3.97  |
| Germany        | 11.15 | 12.41 |
| Hungary        | 1.88  | 1.61  |
| Ireland        | 4.48  | 5.44  |
| Italy          | 1.4   | 1.4   |
| Japan          | 0.67  | 0.51  |
| Netherlands    | 1.61  | 6.56  |
| Poland         | 2.03  | 2.03  |
| Portugal       | 0.35  | 0.58  |
| Spain          | 0.48  | 1.05  |
| Sweden         | 3.84  | 6.02  |
| Switzerland    | 2.18  | 3.54  |
| United Kingdom | 6.52  | 7.7   |
| URSS           | 1.81  | 2.55  |
| Yugoslavia     | 0.07  | 0.14  |

Sources: see text.

**Table A.3. Top 0.1% income shares, 1880-1930**

|                | 1880 | 1890 | 1900 | 1910  | 1920 | 1930 |
|----------------|------|------|------|-------|------|------|
| Argentina      |      |      |      |       |      | 7.52 |
| Australia      |      |      |      |       | 3.97 | 3.2  |
| Canada         |      |      |      |       | 5.36 | 5.68 |
| Finland        |      |      |      |       | 5.92 | 4.74 |
| France         |      |      | 8    | 8     | 7.63 | 5.79 |
| Japan          | 7.22 | 5.63 | 6.83 | 7.75  | 7.9  | 7.32 |
| Netherland     |      |      |      | 8.63  | 8.92 | 6.47 |
| Norway         | 7.89 | 7.71 | 6.59 | 8.03  | 6.19 | 4.35 |
| New Zealand    |      |      |      |       | 3.13 | 2.6  |
| Portugal       |      |      |      |       |      | 5.87 |
| Sweden         |      |      | 8.66 | 8.11  | 5.23 | 4.82 |
| United Kingdom |      |      |      | 11.24 | 8.03 | 7.81 |
| United States  |      |      |      | 8.62  | 5.37 | 6.4  |

Sources: Atkinson *et al.* (2007) and Guilera (2010) for Portugal.

Notes: Argentina's figure for 1930 refers to 1932. Australia's figure for 1920 refers to 1921. France's figures for 1900 and 1910 refer to 1905. Finland's figures on top 1% income shares were very similar to those of Sweden. Consequently, I have assumed that Finland's top 0.1% income shares were proportional to those of Sweden. Japan's figure for 1880 refers to 1886. Netherlands' figure for 1910 refers to 1914. Norway's figure for 1880 refers to 1875, that of 1890 refers to 1888, that of 1900 refers to 1902, that of 1910 refers to 1906, and that of 1930 refers to 1929. 1920's figure has been interpolated. New Zealand's figure for 1920 refers to 1921. Portugal's figure for 1930 refers to 1936. Sweden's figure for 1900 refers to 1903, and that of 1910 refers to 1911. United Kingdom's figure for 1910 refers to 1913. US' figure for 1910 refers to 1913.