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The Comparative Evolution of Bequest Taxation in Historical Perspective*

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ABSTRACT

Bequest tax revenues have been constantly declining in all OECD countries for at least seventy years. We propose an explanation which is based on a dynamic politico-economic model where the evolution of bequest taxation is determined by wealth inequality. Since economic development induces a growing role of labor income and thus a reduction of wealth inequality, bequest taxation is reduced over time. Our model also explains cross-country differences in the level and speed of adjustment of the tax, by embedding structural reallocation from agriculture to manufacturing and a consequent shift of the tax base from easy-to-tax land to hard-to-tax capital. This implies a lower tax level, and a slower equalization-induced tax reduction, the higher is the tax avoidance rate and the less developed is the economy. Finally, the introduction of franchise restrictions which are gradually lifted over time allows the model to reproduce the humped-shaped long-term evolution of bequest taxation starting from the nineteenth century for those countries that are now modern industrial democracies, and also helps to explain the discrepancies currently observed between tax systems in developed and underdeveloped countries.

JEL Classification Numbers: H20, P16, N40, O40.

Key Words: bequest tax, inequality, structural reallocation, redistribution, voting.

1 Introduction

Bequest tax revenues have been constantly declining in all OECD countries for at least seventy years. Recent policy debate and legislative proposals, in countries such as the US, the UK, France, and Italy, are signaling a further acceleration of this decline. Canada, Australia, and New Zealand have abolished their bequest tax completely. In all other cases, the importance of the tax both in terms of GDP and total revenues is now at a historical low point.

No explanation has yet been offered for the vanishing role of bequest taxation. It is indeed puzzling that this happens at a time when the fact that wealth is more concentrated than income has become a well-established stylized fact.¹ Together with persuasive additional evidence that intergenerational transmission is a crucial factor in explaining wealth inequality,² this would call for an important role of bequest taxation, a policy tool that has always been employed to enhance progressivity within a tax system.³ A possible answer to this puzzle can come from another body of recent empirical evidence which has shown that wealth inequality has declined dramatically during the twentieth century.⁴

The fact that wealth inequality, despite being substantial, is yet declining suggests a rationale for the evolution of bequest taxation which we develop within a politico-economic model where the distribution of wealth varies over time according to the stylized facts. However, while we believe that the evolution of inequality represents a fundamental force affecting bequest taxation, the observed cross-country differences in the level, as well as in the variability, of revenues cannot be fully explained by differences in inequality. The explanation we propose rests on differential rates of avoidance and evasion of the tax, combined with an evolution of wealth composition which also occurs at differential rates.

We combine these channels in a politico-economic model of a dynamic, two-sector economy. The first channel at work in our model links inequality, voting and redistribution in the tradition of Meltzer and Richard's (1981) application of the median voter theorem. However, Meltzer and Richard (1981) focus on a static setting with a time invariant wealth distribution, where the expansion on the size of government is explained by an exogenous extension of the voting franchise.

¹See for example Diaz-Gimenez et al.(1997) for data on the US in the postwar period.

²See Harbury (1973) and Kotlikoff and Summers (1981), among others.

³Piketty and Saez (2007) present evidence on relevance of estate taxes for progressivity in historical and international perspective.

⁴See Wolff (1996), Atkinson and Piketty (2007), and the discussion in Section 3.

Here we apply the median voter theorem to a dynamic model where non-overlapping generations of agents, differentiated only in terms of their initial wealth holdings, derive utility from their own consumption and from bequests. In other words, all saving is bequeathed. Since there is no uncertainty, all bequests are voluntary. A tax is imposed on bequests in order to finance a redistributive scheme, so that all individuals have a stake in the tax determination process. In particular, even if the median voter may never have to pay a tax on bequests, as it often happens in the real world, the fact that the tax is used for redistribution ensures that this fiscal scheme enters the median voter's indirect utility function. To concentrate on the redistributive effect of the tax, we assume preferences that guarantee the absence of distortions to the saving/bequest decision. In this framework, the voter with median bequest will choose in each period the tax rate. The analysis of the model shows that wealth inequality declines over time. This process is driven by the increasing role of labor income and is also reinforced by redistributive taxation. As inequality declines, the median voter's relative holdings of bequests get closer and closer to the mean, inducing a sequence of decreasing tax rates. These preliminary results replicate the observed secular fall of wealth inequality and represent a first step toward the understanding of the evolution of bequest taxation.

However, as previously argued, the standard Meltzer and Richard (1981) politico-economic mechanism cannot capture the complexity of the workings of the bequest tax system. Therefore, we add a second channel by embedding the same mechanism within a richer two-sector model where bequests consist of two components, land and capital, whose relative weight varies over time with industrialization. Land and capital are subject to an asymmetry when subject to taxation, with taxes on capital being easier to avoid than taxes on land. Indeed taxes on landed property are much more difficult to elude or evade than those on capital or financial wealth in general, since it cannot be hidden or moved to a tax haven. We take this asymmetry as a deeply-rooted, invariant characteristic of a tax system, which could only be affected by radical transformation of a country's civic culture, but not by routine fiscal policy. Under the expanded framework, we can evaluate the impact of structural reallocation from agriculture to manufacturing on the tax bases of countries at varying stages of development, uncovering the fact that industrialization shifts a country's wealth, and thus its bequest tax base, from hard-to-avoid land toward easy-to-avoid capital. Industrialization thus erodes the tax base in an asymmetric fashion. The asymmetry between land and capital with respect to tax avoidance interferes with the process of structural reallocation and with the determination of the dynamic political equilibrium of the model. Our results show that, for given inequality, the level of the bequest tax decreases in the degree of

avoidance of capital taxation. Intuitively, the median voter sets a lower tax, the higher is tax asymmetry, since tax avoidance dilutes the redistributive impact of the tax, at a given collection cost. The larger is inequality in financial assets, the larger is the reduction of the tax due to tax avoidance. On the other hand, the tax asymmetry delays the reduction of the tax due to wealth equalization, especially when the tax base is disproportionately represented by land, whose distribution tends to be relatively unequal and stable. To sum up, higher avoidance together with fiscal asymmetries makes the tax rate lower, but also makes its reduction more sluggish, especially when a country is still in a relatively underdeveloped stage. Our results can explain why in the US, a country with high tax compliance (i.e., low avoidance), revenues from bequest taxes have been high relatively to the rest of the OECD countries, but are now being phased out, while in the EU bequest taxes have been lower, but their position appears to be more stable.⁵ Moreover, different degrees of avoidance could be the explanation of the radical differences between the systems of taxation in developed and underdeveloped countries, with wealth and bequest taxes playing a minor role in the latter, despite remarkable wealth concentration.

An important extension of the model allows for franchise requirements to be imposed on the voting mechanism. The goal of this extension is three-fold. First, it broadens the horizon covered by the model backward, to explain why bequest taxes were among the first to be introduced when modern systems of taxation were developed during the nineteenth century. If, in an early stage, voting is restricted, even if wealth is unequally distributed no bequest tax is imposed in a political equilibrium. Subsequently, with the gradual extension of the franchise, a tax on bequests is introduced and expanded. Therefore, the introduction of a franchise requirement allows to reproduce the humped-shaped long term evolution of the tax starting from the nineteenth century for those countries that are now modern industrial democracies. Second, in the spirit of Sokoloff and Zolt (2005) who analyze the comparative evolution of tax systems in the Americas over the nineteenth and twentieth centuries, we want to offer an explanation for why different countries historically established different tax structures, with Latin America developing a highly regressive system despite large inequality, and more equal North America embracing instead a progressive system. A franchise restriction can capture the idea that in those societies that began with extreme inequality, elites were able to establish a legal framework that guaranteed them a monopoly over

⁵Italy is an exception: the bequest tax had been abolished in 2001 by the center-right government then in power, but the newly elected center-left coalition has reintroduced it in 2006, albeit in a softer fashion.

political power, and thus to design a tax system that preserved inequality. In other words, the model shows that, under extreme poverty, democratization may never start and bequest taxation may never be implemented. This conclusion can also be applied to today's underdeveloped countries, where a low degree of democracy, captured again by restrictions to political power and in turn linked to extreme inequality, can explain the minor role played by wealth and bequest taxes.

Another extension of the model accounts for the observed expansion of the size of government in the face of reduced revenues from bequests, by introducing wage taxation and by exploiting the impact of industrialization on the wage tax base. Finally, we discuss how the model could be adapted to capture the impact of the residential capital stock on bequest taxation.

The paper is organized as follows. Section 2 introduces the related literature. Section 3 reviews the historical evidence on bequest taxation, as well as wealth inequality, structural change, and the evolution of political systems. Section 4 presents the basic model. Section 5 contains the analysis of the model. Section 6 briefly explores extensions of the model. Section 7 summarizes our findings, derives their implications for policy, and indicates directions for related future research.

2 Related literature

This paper is first of all related to the stream of the literature, initiated by Alesina and Rodrik (1994) and Persson and Tabellini (1994), which has applied the basic Meltzer and Richard (1981) framework to dynamic growth models. However, due to the non-neoclassical properties of the production function, in these models once again wealth distribution remains time invariant, so that the median voter choice is also time invariant. A separate stream of the literature has instead focused explicitly on the evolution of wealth distribution, with Galor and Zeira (1993) showing that under liquidity constraints the evolution of wealth distribution can lead to persistent, steady-state inequality. In their setup, however, no attention is paid to voting mechanisms, and therefore on the implications of the evolution of inequality on the political equilibrium and the associated sequence of taxes. This paper establishes a link between these two streams by introducing a median voter mechanism into a model where the distribution of wealth evolves with income growth.⁶

⁶While a full characterization of a dynamic median voter setup is beyond the scope of the present paper, since as in Saint Paul and Verdier (1993) we adopt the simplifying assumption of a non-overlapping generations model with a 'joy of giving' bequest motive, this work is also related to more general treatments of capital taxation such as Krusell and Rios-Rull (1999), who calibrate a fully dynamic model to match postwar US data, and Hassler et al. (2003), who provide an analytical characterization of Markov perfect equilibria in a model with repeated voting. Other examples

Since we focus on a specific policy tool, the bequest tax, as the object of the median voter choice, and we show how it evolves with wealth inequality, this paper is also naturally related with the literature on intergenerational wealth transmission through bequests. Laitner (2001) establishes the relevance of dynastic behavior for the emergence of wealth concentration. De Nardi (2004) shows that only with voluntary, rather than accidental, bequests individual saving behavior can generate a distribution of wealth that is more concentrated than that of labor earnings. Different systems of inheritance also matter for the evolution of inequality, as shown by Bertocchi (2006) who compares primogeniture and equal partition.

There is also a vast research body that has studied optimal bequest taxation in a variety of settings. The accent is usually on the trade-off between the redistributive equity it conveys and the distortions to wealth accumulation it can cause. Most of these investigations are inherently static, or else conducted at steady state. Cremer and Pestieau (2005) provide a survey of normative contributions, from the standpoint of both equity and efficiency. Blumkin and Sadka (2003) compare the properties of the optimal estate tax under altruistic and accidental bequests, and conclude that estate taxation is supported only under the latter. With respect to this literature, we focus our attention on redistribution under voluntary bequests and abstract from consideration of other forms of saving behavior and distortions to the saving/bequest decision. Recent contributions also include Benhabib and Bisin (2006), who find that in an overlapping generations economy social welfare is maximized with zero estate taxes, Fahri and Werning (2006), who establish that the optimal estate tax is progressive under a welfare criterion that values future generations directly by placing a positive weight on their welfare, and Bossmann et al. (2007), who employ the coefficient of variation as a measure of inequality to show that bequest taxation reinforces the equalizing effect of intergenerational wealth transfers on the distribution of wealth. In broader contexts, Kopczuk (2003) links estate taxation to social security, while Aura (2004) compares the bequest tax with the capital income tax.⁷

Land and the sectoral distribution of output play a crucial role in our model. Among others, Cukierman et al. (1992) and Aizenman and Jinjark (2006) have applied the distinction between easy- vs. hard-to-avoid taxes, that we apply to capital vs. land, to other specific forms of gov-

of voting models where wealth distribution varies are Benabou (2000) and Das and Ghate (2004).

⁷Another stream of the public economics literature has focused on the post-war evolution of corporate taxation, prompted by the fact that in the US corporate tax revenues fell precipitously during the late 1960s and the 1970s. However, since the early 1980s this trend has been reversed (see Auerbach, 2006), suggesting that corporate and estate taxation may not be responding to the same factors.

ernment revenue, namely income taxes vs. seigniorage. Other related implications of the role of land in development are discussed in Eaton (1987), who develops a dynamic specific-factors model similar to ours, Gollin et al. (2002), who stress the role of agriculture in explaining cross-country income disparities, and Galor et al. (2006), who explore the impact of land ownership structure on growth. Finally, Bertocchi (2006) and Caucutt et al. (2007) study the implications of an economy's structural transformation for the transition from primogeniture to partition and for the emergence of social security, respectively.

Finally, this work is also deeply connected with the research program which has focussed on the connection between development and institutions in a long-term perspective, in the tradition of North (1981). More recently, this literature has been enriched by contributions of Engerman and Sokoloff (1997) and Acemoglu and Robinson (2000). The joint evolution of the economic and political system is modeled, among others, by Cervellati et al. (2005), who show how economic inequality is the main determinant of economic and political institutions. Sokoloff and Zolt (2005), on the basis of evidence collected for the Americas, argue that tax systems are among the oldest and most fundamental of institutions, and suggest that inequality is the main force driving the evolution of their structure.

3 Evidence

3.1 Estate taxation

All modern industrial economies rely extensively on progressive personal income taxes. None derives significant revenues from taxes on wealth transfers such as inheritance or estate taxes. Namely, the first is levied on the share of the bequest received by the individual recipient, and is applied in most European countries. The latter is levied on the total estate of the donor, regardless of the characteristics and the number of recipients, and is applied for instance in the US and the UK. While most countries have some form of bequest taxation, Canada abolished its tax in 1972, Australia in 1977, New Zealand in 1992, and Italy in 2001 (Duff, 2005).

Gale and Slemrod (2001) provide a history of the estate tax in the US, where it was first introduced in 1797, only to be eliminated in 1802. Subsequent attempts to tax bequests were in place between 1862 and 1870, in 1894, and between 1898 and 1902, typically in association with military expenses. The precursor of the modern estate tax was finally introduced in 1913, as an attempt to make the tax system more progressive. Legislative activity remained intense during the

1930s and the 1940s. In the postwar period the most significant reform came in 1976, when the Tax Reform Act significantly reduced rates and raised exemptions. The pattern was confirmed in subsequent reforms, with a marked revenue reduction.

In 2001 the US Congress passed a bill according to which estate taxes are scheduled for repeal in 2010, even if they are currently supposed to be re-enacted in 2011. The common perception was that the Bush administration would have tried to eliminate the paradoxical 2011 restoration and make the tax cut permanent. Action in that direction was indeed undertaken in April 2005 when the House of Representatives passed permanent repeal of the estate tax. However, the Senate postponed scheduled action in September 2005 after hurricane Katrina. In June 2006, a clear majority of the US Senate voted a bill for permanent repeal of the tax on inherited wealth, but the measure fell short of the 60 votes required to secure passage.

A quantitative assessment of the developments just described is presented by Joulfanian (1998), who provides figures for the share of estate taxes over total tax revenues, for the fiscal years 1917 through 1997. In fiscal year 1917, the year of enactment, estate tax receipts represent 0.8% of total receipts, and they quickly increase to absorb 3.46% in 1922. After a temporary reduction, revenues reach their peak, at 5.63%, in 1936. In the aftermath of World War II we observe a sharp decline, after which the tax is bound to raise less than 2% of federal revenues in any year. Gale and Slemrod (2001) show a similar hump-shaped pattern, with a peak in the 1930s, for estate tax revenues as a percentage of GDP.

INSERT FIGURE 1

Flora (1983) reports comparable data on inheritance tax revenues over total tax revenues for the central governments of a number of European countries for unbalanced samples within the 1860-1975 period. Figure 1 reports this evidence for Denmark, Germany, Italy, the Netherlands, Norway, and the United Kingdom, for benchmark years running from 1860 to 1970.⁸ If we ignore the temporary plunge in 1920, following World War I, the peak of bequest taxation is reached on average around 1910. After the end of the 1930s, we observe a marked, uninterrupted decline in the share of inheritance tax revenues in all the countries involved. At the same time, the graph reveals large cross-country differences, with the UK reaching in 1910 a 18.3% peak. In the same year, the next highest figure is shown by the Netherlands, at 9.8%, while most other countries are below 4%. However, by 1970, the share of inheritance tax revenues across all countries has converged to

⁸Data refer to the initial year of each of 12 decades (in some cases, data from adjacent years had to be substituted).

a much narrower 0.5-2.3% interval. In the same figure, we also report the data for the US supplied by Joulfianian (1998) and discussed in the previous paragraph. If compared with Europe, the US are latecomers in implementing bequest taxation, as it is the case for the entire welfare state, but their trend confirms the hump-shaped pattern exhibited by Europe.

More recent OECD data on wealth transfer taxes are reported by Cremer and Pestieau (2001) for a sample of industrialized countries in 1998. As a share of GDP, these taxes play an especially important role in France (0.51%) and are significant also in the US (0.36%), while they are negligible for Italy (0.08%), with the other European countries somewhere in between. As a share of total revenues, the US lead with 1.16%, and again Italy lags with 0.13%. However, comparisons are complicated by the fact that, for instance, the deductible is much higher in the US, so that estate taxation in the US concerns only the very wealthy. Since 1965, the evolution of bequest taxes has not been uniform, with a more marked decline in the US and the UK at the beginning of the period, and stability in most other cases.

A commonly cited possible reason for the low revenues generally associated with bequest taxes is the administrative costs associated with them, which tend to be higher for inheritance taxes (Aaron and Munnell, 1992). Avoidance, both in the form of elusion and evasion, is estimated to be particularly widespread for bequest taxes (Cooper, 1979; Duff, 2005). Discretionary trusts, for example, could be used to transfer wealth while avoiding the tax. Gifts, to some extent, can also be used as a means to reduce its impact. More affluent taxpayers tend to be able to employ more sophisticated tax-avoidance strategies. Moreover, different components of wealth are subject to different degrees of tax avoidance, with tangible assets such as land and real estate being much harder to hide or transfer abroad than financial assets. While specific compliance data on bequest taxation are not available, it is useful to report that the overall rate of tax compliance is estimated at 74.5% for the US, 77.8% for the UK, and at 29.5% for Italy, with even lower figures for underdeveloped countries, e.g., 23.8% for Rwanda. The source is the World Economic Forum, 1996.

Sokoloff and Zolt (2005) document the evolution of tax systems in the Americas from the nineteenth century, and show how wealth and bequest taxes were less significant in Latin America as opposed to North America.

The radical differences between the current systems of taxation between developed and underdeveloped countries, with wealth and bequest taxes playing a minor role in the latter, are documented by Burgess and Stern (1993).

3.2 Wealth inequality and structural reallocation

To understand the potential determinants of bequest tax revenues in the past century, we also collect information on the underlying economic fundamentals and in particular on the evolution of wealth inequality and the process of structural transformation from agriculture to manufacturing.

Recent empirical evidence has shown that wealth inequality has declined dramatically during the twentieth century. Wolff (1996) finds a reduction in wealth inequality in the US, UK and Sweden in samples initiating at the beginning of the 1920s, confirming previous findings by Atkinson et al. (1989) on the fall in the share of top wealth-holders in the UK. Further long-term evidence on the basis of tax records is collected by Kopczuk and Saez (2004) and Atkinson and Piketty (2007) for a selection of OECD countries over samples initiating in the early 1910s. Despite this common trend, countries still differ considerably regarding their degrees of wealth inequality. Kapteyn and Panis (2003) show that in 1998 the ratio between median and mean net wealth was 41.4 in the US and 57.2 in Italy.

The same period also witnesses an acceleration of the structural transformation of the most advanced countries from agricultural to industrial economies, with a parallel shift from land to capital as the main component of national wealth. Industrialization and capital accumulation can be proxied by the proportion of the labor force in agriculture, which drops continuously throughout the century for all countries, despite marked differences both in the initial conditions and in the speed of the process. In the US, for instance, the agricultural share drops from 37.6% in 1900 to 3.3% in 1980, while in Italy it drops from 61.8% to 14.6% over the same period (the source is Banks, 2001). Cross-country direct evidence on wealth composition is presented for the year 2000 by Davies et al. (2006), who show that real assets, particularly land and farm assets, are more important in less developed countries. Historical data are scarce, but Frankema (2006) provides estimates for the pre-war Gini coefficients of land holdings for a sample of countries and shows that, in the 1930s, they were higher in Western Europe than in the US (with Italy at 71.5, Germany at 70.5, the UK at 62.6, and the US at 60.1). Moreover, land inequality appears to be relatively stable over the twentieth century, despite the influence of some post-war agrarian reforms. By the 1980s, it is actually larger in many countries (with Italy at 73.3, the UK at 64.4, and the US at 71.9).

3.3 Political institutions

In this section, we briefly discuss the historical evidence related to the evolution of political institutions during the period under consideration, with a focus on the extension of the franchise. The goal is to compare the timing of this process with that of the economic transformations just described. Following Bendix (1978) and Flora (1983), again we will refer to a few case studies, starting with the United Kingdom, where suffrage was gradually extended over the course of the nineteenth and early twentieth century. The 1832 Reform Act granted voting rights to the top 3.5% of population, while the 1867 Second Reform Act extended them to the 7.7%, followed by further extensions. It is only in 1918 that universal male (over age 21) and female (over 30) suffrage was introduced with the Representation of the People Act, which lifted all property restrictions at least for men.

The history of suffrage in the United States is written through constitutional amendments, starting with the 1870 15th Amendment, which barred state laws from restricting any race from voting, until the 1964 24th Amendment, which stated that neither Congress nor the states may condition the right to vote in federal elections on payment of a poll tax or other type of tax.

In Italy a first extension of the property-based electoral law was introduced in 1882, while universal male suffrage was only reached in 1912 for 30 years old, and in 1918 for 21 (even though women were allowed to vote only in 1946).

Most of the other Western European countries, as well as Canada, Australia and New Zealand, reached universal men suffrage by 1920. To conclude, the years immediately following World War I witness the completion of a widespread democratization process initiated during the previous century. Still, voter turnout remains low in most countries at least until World War II.

4 The model

4.1 Production

The economy displays two specific-factor technologies, producing an agricultural good and a manufacturing good using three factors: land, capital, and labor. Land is in fixed supply, and equal to L . At time t , production of the agricultural good, Y_t^A , uses labor N_t^A and land L , according to

$$Y_t^A = L^\alpha N_t^{A1-\alpha} \quad (1)$$

where $0 < \alpha < 1$. Production of the manufacturing good, Y_t^M , uses labor N_t^M and capital K_t according to

$$Y_t^M = K_t^\alpha N_t^{M1-\alpha} \quad (2)$$

The agricultural good is not storable and can be used only for consumption, while the manufacturing good can either be used for consumption or bequeathed to children, who will in turn employ it as capital in the manufacturing sector. Labor is perfectly mobile between sectors at no cost.

4.2 Endowments

We consider a non-overlapping generations model with bequests where individuals live for a single period. There is no population growth, so that each individual gives birth to a single child, to whom he leaves a bequest. All individuals are born with a unit of homogeneous labor endowment which is supplied inelastically. Each individual also receives a capital bequest k_t^i . The distribution of initial capital bequests is assumed to be skewed to the right, i.e., the median capital bequest k_0^m is smaller than the mean k_0 . Since ours is not a theory of how wealth inequality is generated, we simply assume it as a fact. The distribution of capital bequests evolves over time but as we will show its property will persist. Finally, each individual also receives a land bequest e^i , i.e., a fraction of the fixed amount of land L . While the evolution of capital bequests will be optimally determined through individual maximization, land is simply passed on from each individual to his only child,⁹ so that the distribution of land is time invariant.¹⁰ The distribution of land bequests is also assumed to be skewed to the right, i.e., the median capital bequest e^m is smaller than the mean e . Moreover, we assume that the distributions of land and capital are perfectly correlated and that land is more unequally distributed than capital, with $\frac{e^m}{e} < \frac{k_0^m}{k_0}$. The latter assumption is actually not required for the subsequent analysis and is simply introduced for the sake of realism. At each time t , total bequests are the sum of land and capital bequests, i.e., $b_t^i = k_t^i + e^i$, with $\frac{e^m}{e} < \frac{b_t^m}{b_r} < \frac{k_t^m}{k_t}$.

Initially, the aggregate size of the capital is small relative to land, so that aggregate initial wealth in the economy is composed mostly of land.

⁹A market for land could be introduced but would not allow a closed form solution. The fact that land has always been less liquid than capital, because of entails and other forms of legal limitations to the alienation of family land, is widely documented by historians (Goody et al., 1976) and justifies our simplifying assumption.

¹⁰Frankema (2006) confirms the substantial stability of Gini coefficients for land holdings throughout the twentieth century.

4.3 Preferences

Individual preferences are given by

$$u_t^i = (1 - \delta) \log c_t^i + \delta \log k_{t+1}^i \quad (3)$$

where c_t^i is the individual's level of consumption, such that $c_t^i = c_t^{Ai} + c_t^{Mi}$, where c_t^{Ai} and c_t^{Mi} are the individual consumption levels of the agricultural and manufacturing goods, respectively. The agricultural and manufacturing goods are assumed to be perfect substitutes in consumption, i.e., their relative prices are fixed and set equal to 1. The term k_{t+1}^i represents the capital bequest for the child, and δ is a preference parameter, such that $0 < \delta < 1$. The 'joy of giving' bequest motive that we assume is analytically convenient since it implies that the individual does not perceive any indirect effects of current choices on future decisions. Moreover, under our assumptions on preferences a bequest tax is not going to affect the consumption-bequest decision. Thus our formulation allows to focus on the redistributive impact of taxation without having to worry about distortions and a potential equity-efficiency trade-off.

Individuals maximize their utility subject to the following budget constraint:

$$c_t^i + k_{t+1}^i \leq I_t^i \quad (4)$$

where I_t^i is individual income.

Production in both sectors takes place in each period by combining labor, land and capital according to equations (1) and (2), so that each individual receives a wage income from his labor endowment, an interest income from his capital bequest, and a rental income from his land bequest. The level of the wage earned in agriculture and manufacturing is identical since labor is perfectly mobile. Moreover, wage income is identical for all individuals since labor endowments are homogeneous, while interest and rental incomes are proportional to capital and land. Thus this model generates a degree of wealth inequality which is higher than that of wage and income inequality, as suggested by the data. After receiving their income net of taxes, individuals make consumption and capital bequest decisions by maximizing (3) subject to (4). We can derive the indirect utility function as

$$v_t^i = \log I_t^i + \xi \quad (5)$$

where $\xi = (1 - \delta) \log(1 - \delta) + \delta \log \delta$.

4.4 Bequest taxation

Bequest taxation is set through a political choice under majority voting. We initially assume full suffrage. Each individual casts a vote at each period on the contemporaneous level of the tax, τ_t , such that $0 < \tau_t < 1$, to be imposed on the bequest he receives. The tax rate is simply proportional. Since the bequest distribution varies over time, as we will show the level of the tax chosen by the median voter will also vary.

While capital and land bequests are subject to the same tax rate, we assume that capital is harder to tax than land, so that a fraction θ of capital avoids taxation, while land is fully subject to it. We interpret θ as a parameter, rather than a choice variable, since it is meant to capture structural characteristics of a tax system which are determined by civic culture, and in particular by citizen attitudes toward governments, and cannot be affected by routine fiscal policy decisions.¹¹

Bequest taxes are subject to proportional collection costs τ_t^2 . Net tax revenues are equally redistributed in proportion to total bequests. This redistribution scheme implies that even the poorest individual has a stake in the tax determination process. There is no other form of taxation and government expenditures. In particular, to impose a wage income tax would not make sense from a redistribution point of view since the wage is identical for all individuals.

Government revenues in intensive form at each t are given by $\tau_t(1 - \theta)k_t + \tau_t e - \tau_t^2(k_t + e)$. Setting a government balanced budget, all revenues are redistributed. The resulting expression for individual income, assuming no depreciation, is given by

$$I_t^i = \omega_t + [1 + r_t - \tau_t(1 - \theta)]k_t^i + (1 + \rho_t - \tau_t)e^i + (\tau_t - \tau_t^2)(k_t + e) - \tau_t\theta k_t \quad (6)$$

where ω_t is the wage rate, r_t is the interest rate on capital and ρ_t is the rental rate on land.

The way the tax is levied is crucial for future tractability of the model: here we assume that the tax is paid out of the bequest received, without affecting its ability to be used in production. Consequently, individuals receive interest and rental income over the full amount received as a bequest, and pay the tax after investing it. The fact that the tax does not reduce the amount individuals invest is realistic, since bequest taxes are commonly paid in delayed installments over a long time period.¹²

¹¹Alm and Torgler (2007) measure the impact of cultural differences on tax compliance.

¹²As a third alternative, one could have assumed the tax to be imposed on the entire amount of the gross income generated by the investment, thus affecting the wage rate in general equilibrium and complicating the analysis without adding any additional insight. See also footnote 12.

To be noticed is that, as long as some manufacturing good is consumed, the price of the manufacturing good in terms of the agricultural good is 1, so that we can simply sum up all income components in (6). Moreover, as the analysis below will clarify, we can also assume that the price of land in terms of capital is 1, even though strictly speaking the price of land is not defined in a model where land never goes to market. Therefore, we can simply sum up the capital and land holdings which appear in (6). Since the tax rate is proportional, it also represents at each t the share of tax revenues over total income.

5 Analysis of the model

5.1 Factor prices

Under perfect competition in the labor and capital markets, profit maximization yields the following factor prices:

$$\rho_t = \alpha \left(\frac{N_t^A}{L} \right)^{1-\alpha} \quad (7)$$

$$\omega_t^A = (1 - \alpha) \left(\frac{L}{N_t^A} \right)^\alpha \quad (8)$$

$$r_t = \alpha \left(\frac{N_t^M}{K_t} \right)^{1-\alpha} \quad (9)$$

$$\omega_t^M = (1 - \alpha) \left(\frac{K_t}{N_t^M} \right)^\alpha \quad (10)$$

where ω_t^A and ω_t^M are the wage rate in agriculture and manufacturing, respectively. Perfect labor mobility implies that $\omega_t^A = \omega_t^M = \omega_t$. Equating (8) and (10), we obtain the following expression for N_t^M :

$$N_t^M = \frac{K_t}{L} N_t^A \quad (11)$$

which shows that the number of workers in manufacturing is an increasing function of the level of the capital stock.

An implication of (11) is that $\rho_t = r_t$. Therefore, even if the price of land is not defined in the absence of a land market, we can define its implicit price in terms of the present discounted value of the rents accruing to it. It follows that the implicit price of each unit of land will always be equal to the price of capital, as previously assumed in (6).

5.2 Utility maximization

The solution to the individual optimization problem is given by the following consumption and capital bequest functions:

$$c_t^i = (1 - \delta)I_t^i \quad (12)$$

$$k_{t+1}^i = \delta I_t^i \quad (13)$$

with total individual bequest being given by $b_{t+1}^i = k_{t+1}^i + e^i$.

Maximizing the resulting indirect utility function (5) with respect to level of the tax, we obtain the following preferred tax level for each individual:

$$\tau_t^i = \frac{1}{2} \left[1 - \frac{(1 - \theta)k_t^i + \theta k_t + e^i}{k_t + e} \right] \quad (14)$$

Since the second order condition is satisfied so that indirect utility is single-peaked with respect to the tax rate, we can apply the median voter theorem and assert that under majority voting and our assumptions on the distribution of bequests the median voter will set a positive level of the tax τ_t^m according to (14), which is most clearly illustrated by¹³

$$\tau_t^m = \frac{1}{2} \left[1 - \frac{k_t^m + e^m}{k_t + e} - \theta \frac{(k_t - k_t^m)}{k_t + e} \right] \quad (15)$$

5.3 Market clearing

To close the model, we now derive the market-clearing condition for the capital market, which aggregating over individual incomes can be written as

$$K_{t+1} = (1 - \delta)[Y_t + (1 - \tau_t^{m2})(K_t + L)] \quad (16)$$

where $Y_t = Y_t^A + Y_t^M$.¹⁴ Market clearing in the labor market obtains for

$$N_t^A + N_t^M = N_t \quad (17)$$

The agricultural and manufacturing goods markets must also be cleared at each t , implying

¹³Under an alternative tax scheme with the tax imposed on gross income, the problem would not deliver a closed form solution, and possibly not even single-peaked preferences, due to the fact that factor prices would become a function of the tax itself, with the wage rate decreasing and the interest rate increasing with the tax.

¹⁴The unit price assumption, together with our preferences, implies that some manufacturing goods must be consumed, otherwise the price of the manufacturing good would have to be higher than the price of the agricultural good. In other words, $K_{t+1} < Y_t^M$ and the saving rate $(1 - \delta)$ is bounded above by $\frac{Y_t^M}{Y_t}$.

$$Y_t^A = c_t^A N \quad (18)$$

$$Y_t^M = c_t^M N + K_{t+1} \quad (19)$$

From (11) and (17) we can derive the following expression for total output at each t :

$$Y_t = \{[\psi(K_t)]^{1-\alpha} K_t^\alpha + [1 - \psi(K_t)]^{1-\alpha} L^\alpha\} N^{1-\alpha} \quad (20)$$

where $\psi(K_t) \equiv \frac{K_t}{K_t + L}$.

5.4 Dynamic political-economic equilibrium

Definition 1 *A perfect-foresight political-economic equilibrium is a sequence*

$$\{c_t^A, c_t^M, K_t, Y_t^A, Y_t^M, N_t^A, N_t^M, \tau_t^m\}_{t=0}^\infty$$

such that at each t utility and profits are maximized, all markets clear, and the tax rate is optimally set by the median voter, starting from a given initial value of $K_0 > 0$.

The equilibrium path solves simultaneously equations (7) – (10), (12), (13), and (15) – (19). The evolution of individual capital bequests is given by

$$k_{t+1}^i = \delta[\omega_t + (1 + r_t - \tau_t^m(1 - \theta))k_t^i + (1 + \rho_t - \tau_t^m)e^i + (\tau_t^m - \tau_t^{m2})(k_t + e) - \tau_t^m \theta k_t] \quad (21)$$

while the evolution of the average capital-bequest level can be tracked by

$$k_{t+1} = \delta[\omega_t + (1 + r_t - \tau_t^m(1 - \theta))k_t + (1 + \rho_t - \tau_t^m)e + (\tau_t^m - \tau_t^{m2})(k_t + e) - \tau_t^m \theta k_t] \quad (22)$$

which can be restated as

$$k_{t+1} = \delta[y_t + (1 - \tau_t^{m2})b_t] \quad (23)$$

Along the equilibrium path, workers migrate to the manufacturing sector as the capital stock grows, while the agricultural sector shrinks. Therefore, the agriculture share of output varies inversely with the level of development. At the same time, the size of the capital stock increases while the quantity of land is invariant, so that wealth and bequest composition also evolves. In the long run, the dynamical system evolves towards a steady state which is associated with constant values K , B , Y^A , Y^M , N^A , N^M , and τ^m . The steady state average capital k solves the following expression:

$$k = \delta[e^\alpha n^{A1-\alpha} + k^\alpha n^{M1-\alpha} + (1 - \tau^{m2})(k + e)] \quad (24)$$

where n^A and n^M are the steady-state fractions of labor in agriculture and manufacturing, respectively. Steady-state total average bequests are given by $b = k + e$. Because of the collection costs captured by τ^{m2} , the higher the tax, the lower the associated k . Moreover, the higher θ , the lower the tax and the higher is steady-state k . By (11), the tax system also affects labor mobility and structural reallocation from agriculture toward manufacturing.

The evolution of individual capital bequests leads to a steady state capital bequest given by

$$k^i = \frac{\delta}{1 - \delta[1 + r - \tau^m(1 - \theta)]} [\omega_t + (1 + \rho_t - \tau^m)e^i + (\tau^m - \tau^{m2})(k + e) - \tau^m \theta k] \quad (25)$$

where capital inequality simply depends on initial land inequality, even though the relative weight of land inequality is diluted at steady state by the growth of the capital component of total bequests. Similarly, $b^i = k^i + e^i$. Thus, even though initial land inequality prevents convergence of the capital and bequest distributions to full equality, the dynamics of the system predict a gradual reduction of capital and bequest inequality. Nevertheless, $k_t^m < k_t$ at each t , confirming the property assumed for the initial distribution of capital and also implying that wealth inequality always remains higher than wage and income inequality. Moreover, while convergence is accelerated by the redistribution scheme, accumulation is slowed down by the costs of collection.

5.5 The comparative statics of bequest taxation

The expression for the tax rate derived in (15) has an intuitive interpretation. The second term in square brackets, $\frac{k_t^m + e^m}{k_t + e} = \frac{b_t^m}{b_t}$, captures the standard Meltzer and Richard (1981) mechanism: the preferred tax is higher, the smaller is the median bequest if compared with the average bequest, where both components of the bequest are treated symmetrically. When tax avoidance is absent and $\theta = 0$, (15) reduces to $\tau_t^m = \frac{1}{2}(1 - \frac{b_t^m}{b_t})$, so that the gap between the median and the mean bequest is the only relevant consideration: the tax rate is strictly positive as long as the median bequest is lower than the mean, otherwise the median voter would set the tax at 0. Thus, in a full compliance, symmetric tax system, bequest inequality is the only determinant of the tax rate.

However, for $\theta > 0$, the third term in square brackets increases with θ and with the gap between the median and the mean of that bequest component - capital - which is associated with tax avoidance. It follows that the tax rate chosen by the median voter is decreasing in the avoidance rate for capital exhibited by the tax system, and that the negative impact of θ on τ_t^m intensifies with

capital inequality as a proportion of total wealth. Capital inequality therefore induces a reduction of the tax rate below its full compliance, maximum level. The third term can be interpreted as a measure of the asymmetry in the tax system due to the dysfunctions of capital tax collection. In particular, when $\theta = 1$, i.e., capital completely avoids taxation, the level of the tax is at its minimum, since the asymmetry induced by tax avoidance is maximized. Expression (15) reduces to $\frac{1}{2}(1 - \frac{k_t + e^m}{k_t + e})$, which implies that land inequality is the sole determinant of the tax rate in each period.¹⁵ These results can be summarized as follows.

Proposition 1 *At each t the level of the tax rate τ_t^m increases with bequest inequality $\frac{b_t^m}{b_t}$ and decreases with the tax avoidance rate for capital θ .*

5.6 The evolution of bequest taxation

Our original focus is on the evolution of taxation as determined by

$$\frac{\tau_{t+1}^m}{\tau_t^m} = \frac{(1 - \theta)(k_{t+1} - k_{t+1}^m) + (e - e^m)}{(1 - \theta)(k_t - k_t^m) + (e - e^m)} \frac{k_t + e}{k_{t+1} + e} \quad (26)$$

which is smaller than 1, thus indicating a decline toward a steady state value.

By inspection of (26), the decline of the tax rate chosen by the median voter is caused by several forces. The evolution of wealth inequality enters through the first term, which is smaller than 1 because capital inequality declines and the gap between mean and median capital is reduced over time. To be noticed is that the larger is land inequality, i.e., the difference $e - e^m$, the slower the strength of this first factor, since land inequality is time invariant.¹⁶

However, the first term includes another force which affects the evolution of taxation in the opposite direction: the larger is tax avoidance for the capital component of wealth, the weaker the impact of capital equalization and the slower the decline of the tax. Therefore, tax avoidance delays the adjustment of the tax system to the changing wealth distribution. This channel is active independently of the agriculture share of output and wealth, as long as some degree of land inequality persists.¹⁷ In particular, in a full compliance system with $\theta = 0$, (26) reduces to $\frac{b_{t+1} - b_{t+1}^m}{b_t - b_t^m} \frac{b_t}{b_{t+1}}$, where the first term is smaller than 1 for a positive θ , thus implying a faster decline of

¹⁵For the sake of comparison, the tax rate in this case is also below the level that would apply to a scheme according to which taxes and transfers are solely determined on the basis of land holdings.

¹⁶As already discussed in Section 3 and in footnote 10, our assumption is consistent with the available evidence.

¹⁷The impact of θ would only vanish if land inequality were absent, with $e = e^m$ - which never occurs here - and does not depend on the fraction of land over total bequests.

the tax. In other words, under full compliance the equalization force exerts its maximum impact on tax reduction. On the other hand, if capital fully avoids taxation and $\theta = 1$, (26) simplifies to $\frac{b_t}{b_{t+1}}$, so that the decline of the tax is purely associated with capital accumulation. Finally, it should be noticed that the impact of θ on the process is gradually reduced as capital bequests tend to equalization. In other words, in more capital-equal economies the asymmetry between capital and land matters less, while it matters more when capital inequality is still relatively large. Over a cross section, this implies that differences in tax avoidance behavior tend to be more important in more unequal countries.

Finally, the second term in (26), which is smaller than 1, also contributes to the decline of the tax because it reflects the growing collection costs associated with accumulation.

Our main results are summarized in the following proposition.

Proposition 2 *Over time the sequence of tax rates $\{\tau_t^m\}_{t=0}^\infty$ decreases with the reduction of bequest inequality and with capital accumulation, at a rate which is decreasing in land inequality and in the tax avoidance rate for capital θ . The impact of θ is increasing in capital inequality.*

For $0 < \theta < 1$, in the long run the level of the tax rate converges to a positive level given by

$$\tau^m = \frac{1}{2} \left[1 - \frac{k^m + e^m}{k + e} - \theta \frac{(k - k^m)}{k + e} \right] \quad (27)$$

which is bounded above 0 by the presence of land, preventing the convergence to 1 of the second term and to 0 for the third. The steady state level of the tax is increasing in inequality and decreasing in tax avoidance. In particular, in a full compliance system the steady state tax is given by $\frac{1}{2} \left(1 - \frac{k^m + e^m}{k + e} \right)$, which is higher than its full avoidance analog, $\frac{1}{2} \left(1 - \frac{k + e^m}{k + e} \right)$.

The implications of the decline of taxation for the evolution of average and individual capital and bequest are the following. By (24), k is affected by the tax, but in turn the tax will have reached its minimum level by the time a steady state is reached. Therefore, in the limit, the impact of the tax on total capital and bequests will be negligible. In the long run the impact of taxation on individual capital will also become negligible, with the wage rate and initial land holdings representing its main determinants. On the other hand, the relative weight of initial land holdings will also be reduced by the process of development, while at the same time the unit rent will decline. Therefore, the common wage component will constitute the most important determinant of individual capital holdings in the long run. It is the growing role of labor income in wealth

determination that drives the process of equalization in this model.¹⁸

To sum up, the evolution of taxation in this model is shaped by wealth equalization, sectoral reallocation, and by the avoidance rate exhibited by the tax system relative to the capital component of wealth. The effect of inequality reduction is magnified by the process of capital accumulation, which further accelerates the decline of the tax. Moreover, larger compliance implies a larger level of taxation but also its faster decline, while avoidance makes the tax system slow to adjust to the changing structure of the economy, especially when a country is still in a relatively agricultural stage and landed property is very concentrated. The policy implications are that, as the distribution of bequests equalizes over time, the political justification for bequest taxation should also decline, and that at the same time high avoidance keeps taxation at a low but persistent level throughout the process.

5.7 Franchise requirements and the initial rise of bequest taxation

In this first extension of the basic model we allow for franchise requirements to be imposed on the voting mechanism. While there is a well-established literature which has dealt with the historical reasons for the observed expansion of the franchise,¹⁹ the scope of the present paper is just to evaluate its effect on the issue of interest, by considering an exogenous franchise requirement for participation in the voting process.²⁰ The requirement is expressed in terms of a minimum bequest level. This wealth threshold is not to be strictly interpreted as a rule specified by the voting mechanism and thus potentially set and adjusted by the elite in power, but as a parameter meant to capture the broader fact that an exogenously-determined socioeconomic status is necessary to permit political activism. Under this assumption, we can apply to the model previously developed the main intuition advanced by Meltzer and Richard (1981), according to which extensions of the franchise should be accompanied by an increase in tax revenues, and study how the interaction between franchise extension and the evolution of wealth inequality, taking into account sectoral reallocation, affects tax policy.

¹⁸The process of wealth equalization does not depend on the presence of land and would occur in any economy with a growing capital stock and homogeneous labor endowments. The presence of land only prevents convergence to full wealth equality and a null level of the tax.

¹⁹See Justman and Gradstein (1999), Acemoglu and Robinson (2000), Bertocchi and Spagat (2001), Lizzeri and Persico (2004), Llavador and Oxoby (2005), Jack and Lagunoff (2006), and Cervellati et al. (2005).

²⁰Saint-Paul and Verdier (1993), Bertocchi and Spagat (2004) and Bertocchi (2006) also introduce an exogenous franchise requirement.

Let the franchise requirement be set at a bequest level $\tilde{b} \geq b_0$. In other words, initially the median voter is richer than the mean individual. This implies $\tau_0^m = 0$. The accumulation process provokes growth of the average bequest. Nevertheless, taxation will not be introduced until the time t' at which a sufficient number of people have crossed \tilde{b} , so that the median voter is poorer than the mean: this implies $\tau_{t'}^m > 0$. At this early stage, when wealth is mostly constituted by land, the relative avoidance rate of the tax system, and in particular capital tax avoidance, represent marginal considerations. After t' the tax rate keeps increasing under the pressure of further franchise expansion, while at the same time it also reflects the continuous decline of wealth inequality and industrialization, in a way which is inversely related to the avoidance rate, according to the previous analysis. The turning point in the evolution of tax revenues depends on the joint dynamics of democratization and wealth equalization. The tax rate starts its decline when the latter force becomes stronger than the former. In particular, after full democratization is reached, the tax rate can only decline. This pattern replicates the humped-shaped long-term evolution of the bequest tax for those countries that are now modern industrial democracies, where the tax is introduced and progressively expanded in the nineteenth century when wealth inequality is still very high, reaches a peak during the initial decades of the twentieth century, and is subsequently reduced.

Moreover, the same framework can also explain why different countries historically developed different modern systems of taxation. Sokoloff and Zolt (2005) analyze the comparative evolution of tax systems in the Americas over the past two centuries and document that in the nineteenth century Latin America designed a highly regressive system, while North America embraced a progressive one. This pattern is associated to the much higher degree of economic and political inequality in Latin America, which allowed the local elites to develop a tax system that preserved inequality. In our framework, a relatively high franchise requirement, and/or extreme poverty on the lower side of wealth distribution, could indeed prevent democratization as well as the implementation of tax policies for a protracted period of time.

Finally, this version of the model can also suggest another reason - beside high avoidance - for the deep contrasts still existing today between the tax systems of modern industrial democracies and those of underdeveloped countries, with the latter showing much less reliance on bequest and wealth taxation, and progressive taxation in general. These differences can be explained by the low degree of democracy prevailing in most underdeveloped countries acting in combination with extreme inequality.

5.8 Summary and discussion

In the extended model with franchise requirements, bequest tax revenues, as a share of income, are shown to increase initially and then decrease. Democratization, wealth equalization, industrialization and the avoidance rate reflected by the tax system contribute to the determination of this hump-shaped evolution. The purpose of this subsection is to compare the implications of the model with the evidence presented in Section 3. Our theory suggests that in an initial stage, under the pressure of democratization, bequest tax revenues should increase, in the face of an initially high degree of wealth inequality. Indeed, Figure 1 confirms that for a sample of European countries the share of inheritance tax revenues over total tax revenues increases until a peak which is reached, on average, around 1910, after a first wave of electoral reforms that significantly expand the voting franchise. Despite the fact that the democratization process is not yet completed in 1910, since the universal franchise is only reached in most countries in the next decade, while full democratization as captured by voter turnout is further delayed until after World War II, after 1910 we start observing a decline of the tax which can be explained by the decline of wealth inequality and the simultaneous process of industrialization, as suggested by our model. However, while the process of industrialization is relatively continuous throughout the twentieth century, inequality reduction really does not start until the early 1920s according to the data reported in Section 3. Therefore, it is important to notice that, while the analysis derives implications for the income share of bequest taxation, the available data reported in Figure 1 reflect the share of bequest taxation out of total tax revenues. Since total tax revenues over income are quickly increasing in Europe in this period, as documented by Lindert (1994), it is legitimate to date the turning point for the income share of bequest taxation to a decade or two after 1910, consistently with the inequality reduction facts.

The available data on tax compliance are also consistent with the role that our model assigns to this parameter, with low-compliance Continental European countries exhibiting lower, but more stable bequest tax shares than the high-compliance UK. Moreover, as predicted by Proposition 2, the impact of tax avoidance on the speed of adjustment is magnified by land inequality, consistently with the fact that the latter appears to have been lower in the UK than in the rest of Europe.

The US fit this overall picture only partially, because of the late introduction of the bequest tax. This is consistent with a delayed development of the entire welfare state in this country. Nevertheless, the figure confirms also for the US the presence of a hump-shaped evolution with a drastic drop of revenues immediately after World War II, followed by substantial stability. Once again, this pattern closely reflects the fact that the 1940s witness in this country an acceleration of

the decline in wealth concentration and a further shift toward manufacturing.

6 Extensions

6.1 Income taxation and the size of government

In this subsection we add income taxation in the form of wage taxes. The goal of this exercise is to introduce a preliminary analysis of a more complete system of taxation, and at the same time to offer an explanation of the expansion of the size of government, which has been documented for the post-war period despite the decline of bequest taxation. Once again, we exploit the asymmetry between the agriculture and manufacturing sectors, by assuming that manufacturing wages are easier to tax than agricultural wages. Given the different ways production is organized in the two sectors, with larger and more urbanized production units in manufacturing, this assumption is easily justified. To simplify the analysis, we in fact assume that a wage tax is exclusively imposed on manufacturing wages. We further assume that the tax rate on manufacturing wages is set at an exogenous constant level, τ^w , and that revenues from wage taxes are earmarked to finance in each period government expenditures g_t , while revenues from bequest taxes are set and distributed as previously assumed. Within this framework, industrialization will determine an expansion of the tax base for wage taxation, thus allowing an expansion of government expenditures at a rate which is linked to the rate of growth of employment in manufacturing, which as a country industrializes is higher than the rate of growth of total income before a steady state is reached.

Thus, combining the two forms of taxation, even if redistributive bequest taxation declines over time, the size of government can actually increase because of the government expenditures component. Since in 1999 the latter represented the bulk of total government outlays (69.5% and 62.2% in the US and the EU, respectively)²¹, our theory of bequest taxation can be reconciled with the overall evidence on the evolution of government budgets.

6.2 Land vs. housing

While in our model wealth reallocation from land to capital is one of the driving forces behind the long-term evolution of bequest taxation, another crucial distinction, between physical capital and housing, becomes even more important in current policy applications. Land and housing share the common feature of being relatively easier to tax than capital. However, unlike land, the distribution

²¹The source are OECD data as elaborated by Alesina et al. (2001).

of real estate is increasingly characterized by the fact that the middle class holds an overwhelming proportion of wealth in it, in the form of principal residence. This is due to the fact that, on the one hand, poor people are liquidity constrained and cannot afford to buy a house, while on the other residential investment only needs to absorb a fraction of total wealth for the rich. Decomposing inequality by wealth components in order to incorporate this assumption would make the model more complicated. However, the dynamics would be simplified by the fact that one would not need to embed a reallocation mechanism from capital to real estate. While we leave this extension for future research, it is clear that a middle class with a higher stake in an easy-to-tax asset would only push toward an even lower level of the tax rate, confirming our original intuition regarding the role of land.

7 Conclusion

Our goal was to explain the comparative evolution of bequest taxation in a historical perspective. To this end, we have developed a dynamic, two-sector version of the Meltzer and Richard (1981) median voter model where taxes are imposed on bequests. Wealth is more unequally distributed than income, because it is transmitted through unequal bequests. However, since the model allows the distribution of wealth to evolve over time, bequest taxation as set by a median voter also evolves over time. The model also captures the impact of industrialization on the bequest tax base, through an asymmetry between land and capital taxation. The convergence of wealth distribution and industrialization, due to the growing role of labor income, imply a gradual decline of bequest taxation, but the asymmetry in the tax avoidance rate between land and capital also matters, with a high rate of avoidance for capital negatively affecting both the level and the speed of adjustment of the tax to the changing economic structure, especially when a country is still in a relatively agricultural stage. The results match the relevant stylized facts regarding bequest tax revenues, as well as the dynamics of wealth inequality, structural reallocation from agriculture to manufacturing, and tax compliance.

Adding initial franchise requirements to this framework allows to reproduce the humped-shaped long term evolution of the bequest tax starting from the nineteenth century for those countries that are now modern industrial democracies. Moreover, our conclusions can be reconciled with the available evidence on the growing size of government, and can be extended to a framework where real estate, rather than land, is the relevant alternative to capital.

The implications of these results for policy is that, if the pattern exposed by the recent long term investigations of wealth inequality in rich democracies is not to be reversed in the future, the fate of the death tax is probably going to be death. On the other hand, for developing countries with high rates of tax avoidance, extreme wealth inequality and/or undemocratic political systems, the current burden of bequest and wealth taxes appears to be too low, making the case for an expansion of this policy tool in the future.

While the present investigation has been mostly focused on bequest taxation, a goal for future research is to understand those factors that have shaped the evolution of the broader institutions of taxation across different countries. While so far we have highlighted the role of wealth inequality and structural reallocation, other factors such as the share of wages over profits, the impact of globalization, as well as ethnic conflict and family structure, can also be evaluated as potentially relevant. This research would extend our understanding of how institutions interact with the processes of economic growth and development.

References

- Aaron, H.J., and Munnell, A.H., 1992, Reassessing the Role for Wealth Transfer Taxes, *National Tax Journal* 45, 119-43.
- Acemoglu, D. and Robinson, J., 2000, Why Did the West Extend the Franchise? Democracy, Inequality and Growth in Historical Perspective, *Quarterly Journal of Economics* 115, 1167-99.
- Aizenman, J. and Jinjarak, Y., 2006, Globalization and Developing Countries: A Shrinking Tax Base? NBER Working Paper No. 11933.
- Alesina, A., Glaeser, E. and Sacerdote, B., 2001, Why Doesn't the United States Have a European-Style Welfare State? *Brookings Papers on Economic Activity* 2, 187-278.
- Alesina, A. and Rodrik, D., 1994, Distributive Politics and Economic Growth, *Quarterly Journal of Economics* 109, 465-90.
- Alm, J. and Torgler, B., 2007, Culture Differences and Tax Morale in the United States and in Europe, *Journal of Economic Psychology* 27, 224-2.
- Atkinson, A., Gordon, J. and Harrison, A., 1989, Trends in the Shares of Top Wealth-holders in Britain, 1922-1981, *Oxford Bulletin of Economics and Statistics* 51, 316-32.

- Atkinson, A. and Piketty, T., 2007, *Top Incomes over the Twentieth Century*, Oxford University Press, Oxford.
- Auerbach, A.J., 2006, *Why Have Corporate Tax Revenues Declined? Another Look*, NBER Working Paper No. 12463.
- Aura, S., 2004, *Estate and Capital Gains Taxation: Efficiency and Political Economy Considerations*, CESifo Working Paper No. 1198.
- Banks, A., 2001, *Cross-National Time Series, 1815-1999*, Center for Comparative Political Research, State University of New York, Binghamton.
- Benabou, R., 2000, *Unequal Societies: Income Distribution and the Social Contract*, *American Economic Review* 90, 96-129.
- Bendix, R., 1978, *Kings or People: Power and the Mandate to Rule*, University of California Press, Berkeley.
- Benhabib, J., and Bisin, A., 2006, *The Distribution of Wealth and Redistributive Policies*, mimeo.
- Bertocchi, G., 2006, *The Law of Primogeniture and the Transition from Landed Aristocracy to Industrial Democracy*, *Journal of Economic Growth* 11, 41-68.
- Bertocchi, G. and Spagat, M., 2001, *The Politics of Co-optation*, *Journal of Comparative Economics* 29, 591-607.
- Bertocchi, G. and Spagat, M., 2004, *The Evolution of Modern Educational Systems: Technical vs. General Education, Distributional Conflict, and Growth*, *Journal of Development Economics* 73, 559-82.
- Blunkin, T. and Sadka, E., 2003, *Estate Taxation with Intended and Accidental Bequests*, *Journal of Public Economics* 88, 1-21.
- Bossmann, M., Kleiber, C. and Wälde, K., 2007, *Bequests, Taxation and the Distribution of Wealth in a General Equilibrium Model*, *Journal of Public Economics* 91, 1247-71.
- Burgess, R. and Stern, N., 1993, *Taxation and Development*, *Journal of Economic Literature* 31, 762-830.

- Caucutt, E. M., Cooley, T. F. and Guner, N., 2007, The Farm, the City, and the Emergence of Social Security, NBER Working Paper No. 12854.
- Cervellati, M., Fortunato, P. and Sunde, U., 2005, Hobbes to Rousseau: Inequality, Institutions, and Development, *Economic Journal*, forthcoming.
- Cooper, G., 1979, A Voluntary Tax? New Perspectives on Sophisticated Tax Avoidance, The Brookings Institution, Washington.
- Cremer, H. and Pestieau, P., 2005, Wealth Transfer Taxation: A Survey, in Gerard-Varet, L.A., Kolm, S.C. and Mercier Ythier, J. (eds.), *Handbook on the Economics of Giving, Reciprocity and Altruism*, North-Holland.
- Cukierman, A., Edwards, S. and Tabellini, G., 1992, Seigniorage and Political Instability, *American Economic Review* 82, 537-55.
- Das, S. and Ghate, C., 2004, Endogenous Distribution, Politics, and the Growth-Equity Tradeoff, *Contributions to Macroeconomics*, Berkeley Electronic Press 4, 1-30.
- Davies, J.B., Sandstrom, S., Shorrocks, A. and Wolff, E.N., 2006, The World Distribution of Household Wealth, mimeo.
- De Nardi, M., 2004, Wealth Inequality and Intergenerational Links, *Review of Economic Studies* 71, 743-68.
- Diaz-Gimenez, J., Quadrini, V. and Rios-Rull, J.-V., 1997, Dimensions of Inequality: Facts on the U.S. Distributions of Earnings, Income and Wealth, *Federal Reserve Bank of Minneapolis Quarterly Review* 21, 3-21.
- Duff, D.G., 2005, The Abolition of Wealth Transfer Taxes: Lessons from Canada, Australia, and New Zealand, University of Toronto Legal Studies Research Paper No. 05-08.
- Eaton, J., 1987, A Dynamic Specific-Factors Model of International Trade, *Review of Economic Studies* 54, 325-338.
- Engerman, S. L., and Sokoloff, K. L. 1997, Factor Endowments, Institutions and Differential Paths of Growth Among New World Economies: A View from Economic Historians from the United States, in Haber, S. (ed.), *How Latin America Fell Behind*, Stanford University Press, Stanford.

- Farhi, E. and Werning, I., 2006, Progressive Estate Taxation, mimeo.
- Flora, P., 1983, *State, Economy, and Society in Western Europe 1815-1975: A Data Handbook* -Vol. I: The Growth of Mass Democracies and Welfare States, St. James Press, Chicago.
- Frankema, E., 2006, *The Colonial Origins of Inequality: Exploring the Causes and Consequences of Land Distribution*, Groningen Growth and Development Centre Research Memorandum GD-8.
- Galor, O., Moav, O. and Vollrath, D., 2006, Inequality in Land Ownership, the Emergence of Human Capital Promoting Institutions and the Great Divergence, mimeo.
- Galor, O. and Zeira, J., 1993, Income Distribution and Macroeconomics, *Review of Economic Studies* 60, 35-52.
- Gale, W.G. and Slemrod, J., 2001, Rethinking the Estate and Gift Tax: Overview, in Gale, W.G., Hines, J.R.Jr. and Slemrod, J. (eds.), *Rethinking Estate and Gift Taxation*, Brookings Institution, Washington.
- Gollin, D., Parente, S. and Rogerson, R., 2002, The Role of Agriculture in Development, *American Economic Review* 92, 160-64.
- Goody, J., Thirsk, J. and Thompson, E.P. (eds.), 1976, *Family and Inheritance: Rural Society in Western Europe 1200-1800*, Cambridge University Press, Cambridge.
- Jack, W. and Lagunoff, R., 2006, Dynamic Enfranchisement, *Journal of Public Economics* 90, 551-72.
- Joulfaian, D., 1998, *The Federal Estate and Gift Tax: Description, Profile of Taxpayers, and Economic Consequences*, Office of Tax Analysis Paper No. 80.
- Justman, M. and Gradstein, M., 1999, The Industrial Revolution, Political Transition, and the Subsequent Decline in Inequality in 19-th Century Britain, *Explorations in Economic History* 36, 109-27.
- Harbury, C.D., 1973, Inheritance and the Distribution of Personal Wealth in Britain, *Economic Journal* 83, 810-33.
- Hassler, J., Rodriguez Mora, J.V., Storesletten, K. and Zilibotti, F., 2003, The Survival of the Welfare State, *American Economic Review* 93, 87-112.

- Kapteyn, A. and Panis, C., 2003, The Size and Composition of Wealth Holdings in the United States, Italy, and the Netherlands, NBER Working Paper No. 10182.
- Kopczuk, W., 2003, The Trick is to Live: Is the Estate Tax Social Security for the Rich? *Journal of Political Economy* 111, 1318-41.
- Kopczuk, W. and Saez, E., 2004, Top Wealth Share in the United States, 1916-2000: Evidence from Estate Tax Returns, *National Tax Journal* 57, 445-88.
- Kotlikoff, L. J. and Summers, L. H., 1981, The Role of Intergenerational Transfers in Aggregate Capital Accumulation, *Journal of Political Economy* 89, 706-32.
- Krusell, P. and Rios-Rull, J.-V., 1999, On the Size of Government: Political Economy in the Neoclassical Growth Model, *American Economic Review* 89, 1156-81.
- Laitner, J., 2001, Secular Changes in Wealth Inequality and Inheritance, *Economic Journal* 111, 691-721.
- Lindert, P., 1994, The Rise in Social Spending 1880-1930, *Explorations in Economic History* 31, 1-37.
- Lizzeri, A., and Persico, N., 2004, Why Did the Elites Extend the Suffrage? Democracy and the Scope of Government, with an Application to Britain's 'Age of Reform', *Quarterly Journal of Economics* 119, 707-65.
- Llavador, H. and Oxoby, R.J., 2005, Partisan Competition, Growth and the Franchise, *Quarterly Journal of Economics* 120, 1155-89.
- Meltzer, A.H. and Richard, S.F., 1981, A Rational Theory of the Size of Government, *Journal of Political Economy* 89, 914-27.
- North, D.C., 1981, *Structure and Change in Economic History*, Norton, New York.
- Persson, T. and Tabellini, G., 1994, Is Inequality Harmful for Growth? *American Economic Review* 84, 600-21.
- Piketty, T. and Saez, E., 2007, How Progressive is the US Federal Tax System? A Historical and International Perspective, *Journal of Economic Perspectives* 21, 3-24.

Saint Paul, G. and Verdier, T., 1993, Education, Democracy and Growth, *Journal of Development Economics* 42, 399-407.

Sokoloff, K.L. and Zolt, E.M., 2005, Inequality and the Evolution of Institutions of Taxation: Evidence from the Economic History of the Americas, in Edwards, S. (ed.), *Growth, Institutions and Crises: Latin America from a Historic Perspective*, University of Chicago Press, Chicago.

Wolff, E.N., 1996, International Comparisons of Wealth Inequality, *Review of Income and Wealth* 42, 433-52.

World Economic Forum, 1996, *The Global Competitiveness Report 1996*, World Economic Forum, Geneva.

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