

Wealth Transfer Taxation: An Empirical Investigation

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Abstract

We present an empirical model of wealth transfer taxation in the revenue systems of the G7 countries - Canada, France, Germany, Italy, Japan, the U. K. and the U. S. - over the period from 1965 to 2009. Our model emphasizes the influences of population aging and of the stock of household wealth in an explanation of the past and likely future of this tax source. Simulations with the model using U.N. demographic projections and projections of household wealth suggest that even in France and Germany where reliance on wealth transfer taxation has been increasing for part of the period studied, wealth transfer taxes can be expected to wither away as population aging deepens over the next three decades. Our results indicate that recent tax designs that rely upon the taxation of wealth transfers to preserve equity in the face of declining taxation of capital incomes may be, in this respect, politically infeasible for the foreseeable future. We conclude by using the case of wealth transfer taxation to raise the general question of the extent to which the consistency of a proposed reform with expected political equilibria ought to play a role in the design of a normative policy blueprint.

Keywords: wealth transfer taxation, bequests, revenue structure, household wealth, population aging, solidarity index, fixed effects estimation

JEL classification: H20, P16, P35, P50

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1. Introduction

In this paper we present an empirical model of wealth transfer taxation in the G7 countries over the period from 1965 to 2009.¹ We use the estimated model to forecast the likely role of wealth transfer taxation in the revenue systems of the G7 over the next three decades, and we consider the implications of these simulations for tax designs that propose to rely upon heavier bequest taxation to maintain equity in the tax system.

Despite its universally low and, in many countries, its diminishing importance in contemporary revenue systems, the taxation of inherited wealth and bequests has assumed new importance in tax design in recent years, for several reasons. First, taxes on income from capital - an indirect form of wealth taxation - have gradually declined since World War II, most likely in response to the increasing international mobility of capital. In the most recent tax design, the factors underlying this development have led to renewed emphasis on taxation of the stock of wealth as a means of preserving vertical equity. The Mirrlees Review of the U.K. tax structure (2011) recommends lighter taxation of capital income, in accordance with its increasing mobility, through exemption of the 'normal' return to investment.² As a complement, it also suggests serious consideration be given to a return to higher rate of a tax on inherited wealth and bequests so as to maintain equity in the tax system as a whole.

A second and reinforcing argument for increased reliance on wealth transfer taxation comes from Piketty and Saez's (2012) critique of optimal tax work suggesting that the optimal taxation of wealth is too low. They argue that existing work on inheritance and capital taxation is not 'realistic', in the sense that it places too little emphasis on inequality in inheritances, ignores the fact that interest rates tend to exceed growth rates implying domination of society by *rentiers*, places too much emphasis on high long run elasticities of saving and capital, and on stability of rates of return. They suggest, in partial contrast to the Mirrlees Review, that there is room in an optimal tax design for both inheritance and capital income taxation.³

A third reason for renewed interest in the taxation of inherited wealth is simply the increasing skewness in the distribution of income over the last two decades, as indicated for example by time series on top income shares (Atkinson *et al.*, 2011; Atkinson and Piketty, 2010; Scheve and Stasavage, 2012a) and growing inequality in wealth (Piketty, 2014). Wealth transfer taxation is, or can be, highly progressive, and so would help to reduce inequality in after tax incomes, even if it raises little in the way of revenues.⁴

¹ The G7 countries are: Canada, France, Germany, Italy, Japan, the United Kingdom and the United States.

² See also Boadway *et al.* (2010) and Boadway (2002).

³ An increase of wealth transfer taxes is suggested also by Alvaredo *et al.* (2013), who argue that wealth transfer taxes depend on the role of inheritance in determining lifetime inequality. In Europe, for instance, as inheritances are again becoming an important factor in wealth transmission and lifetime inequality, people not receiving 'large' bequests become more interested in having more wealth transfer taxation.

⁴ See OECD (2008) for an analysis on income distribution and poverty in OECD countries. See also Piketty and Saez (2007) for evidence about the historically significant, but declining role of estate taxation in the progressivity of the U.S. tax system.

Finally, and to further emphasize the issue of equity in taxation raised above, one may note that the general shift from income to consumption taxation that has been going on over the past three or four decades, has increased the salience in policy discussions of the taxation of inheritances and bequests. This is simply because the part of income not taxed under an annual consumption tax regime will escape taxation completely over a person's lifetime if it is passed on to the next generation.⁵

We are interested in understanding empirically why reliance on taxation of wealth transfers has generally been declining in the post- WW2 period despite normative arguments to the contrary, and in making projections of what can be expected to happen in this regard over the next three decades, barring some dramatic change in the nature of electoral politics in these countries. After providing a selective survey of the literature in the next section that highlights attempts to understand the motivation for bequests and the evolution of wealth transfer taxation in democratic countries, in section three we present a basic theoretical framework that highlights that there are two key factors explaining relative reliance on wealth transfer taxes in an evolving political equilibrium in mature democracies: aging of the population, and the evolution of the stock of household wealth. The first of these two elements, the demographic effect, is suggested by review of the literature on the taxation of bequests. Its role in our empirical model is also consistent with the conceptual approach to the understanding of the political economy of tax systems developed by Hettich and Winer (1999), Kenny and Winer (2006), Profeta (2007), Winer *et al.* (2011) and others.

The second element, the size of the wealth transfer tax base, is a standard variable that must always appear in any complete model of a tax system. We note that to the best of our knowledge, no previous research has assessed the joint roles of aging and the stock of household wealth in the evolution of wealth transfer taxation.

We begin moving towards empirical implementation of the model in a fourth section where we look carefully at the evolution of wealth transfer taxation in the G7, at the stocks of household wealth in the G7, and at population aging in these countries. We focus on wealth transfer taxation in the G7 countries from 1965 to 2009 because a good measure of the relevant tax base - household wealth - now exists for these countries over this period.

In section five we present an estimating equation along with the results of empirical implementation of the model. The empirical analysis shows clearly that general aging of the population in G7 societies has a consistently negative effect on reliance on wealth transfer taxation, while an increase in the stock of household wealth has a positive effect. For the somewhat neglected case of wealth transfer taxation, these results contribute to a growing body of work that aims to uncover the underlying determinants of tax structure in mature democracies.

⁵ For textbook discussions of this point, see for example Musgrave, 1959 and the 'Meade Report' 1978, chp. 15.

To complete the analysis, we conduct a simulation exercise using the estimated model in order to predict the future of wealth transfer taxes in the G7 countries over the next three decades. The analysis suggests that reliance on such taxation will decline substantially over the next two three decades. We use these simulations to put forward the challenge to tax design, and to policy design in general, posed by predictions about political equilibria that are out of step with the direction indicated by normative policy arguments. Expanding the set of ideas about what may be socially desirable, which hopefully will influence what governments do, is usually the object of a tax design analysis. However, when the direction of reform suggested by normative ideas - in particular, that reliance on wealth transfer taxation ought to be increased - is at odds with the expected evolution of equilibrium tax structure, it is reasonable to expect that politicians will end up picking and choosing from the designer's optimized menu of reforms. To the extent that this picking and choosing occurs, the original tax design is no longer relevant in a basic sense. This is an important point.⁶

That the taxation of bequests, a part of any well-designed consumption tax that is required to insure equitable treatment of those with and without capital assets, would be left aside is what Charles McLure feared in preparing his well-known broad-based income tax proposal for President Reagan in the early 1980s (see McLure and Zodrow, 2007).⁷ Despite prevailing academic opinion at the time which favored a shift towards consumption taxation, McLure relied on the older Schanz-Haig-Simons tradition in advocating a broad based income tax, rather than propose a consumption tax that would likely be implemented without a key provision concerning the taxation of bequests.

Since demographic aging in the G7 will continue, projections made with our estimated model suggest that any tax reform proposal that places renewed emphasis on the taxation of wealth transfers may not be aligned with general trends in the political economies of these countries, and is at risk in the basic sense described above.

2. A selective survey of literature concerning wealth transfer taxation in democratic countries

The bequest motive appears to be an important, measurable feature of human behavior (Bernheim, 1991; Kopczuk 2013; and Davies and Shorrocks 2000). Thus we should expect that inheritances and bequests may be a target for taxation. However, what pattern such taxation will actually take, or even if it will exist at all, are other matters, and there is actually little

⁶ The question of whether normative public finance needs political economy has been raised before. See Winer and Shibata (2002) and the debate therein between Boadway and Hettich, and Hettich and Winer (2006). In broader contexts, arguments for taking political feasibility or consistency with current and expected political equilibria into account in normative policy design have been made over the years by McKee and West (1981), Dixit (1997), Acemoglu and Robinson (2013), and Rodrik (2014) among others. See Castanheira et al. (2012) for a review of political motives behind tax reforms.

⁷ See also Glennester (2011) on the failure of the Labour government to adopt the promised wealth tax in 1974-76 in the U.K.

empirical work modelling the evolution of bequest taxation.

In terms of relative reliance on the taxation of inheritances and bequests in total tax revenues, data from Flora (1983) for European countries in the period 1860-1975 show that the peak of bequest taxation is reached for most countries by 1910. From 1930 the decline in reliance on this kind of tax has already started. Gale and Slemrod (2001) point out that the U.S. implemented bequest taxation later than most European countries, but the trend is the same there: there is a sharp decline after World War II.⁸ This sharp decline is also a feature of wealth transfer taxation in Canada, Italy and the U.K., as shown in Figures 1a to 1d below.

Recent data for OECD countries collected by Cremer and Pestieau (2006) show that the tendency for inheritance taxation to decline is broadly based. Canada, Australia and New Zealand have even abolished explicit bequest taxes, though there is indirect taxation in Canada via the taxation of capital gains (deemed realized) at death.⁹ The declining reliance on inheritance taxes in developed countries since 1945 is also documented in Bertocchi (2011).

Some arguments which may help explaining these trends have been advanced. Bird (1991) suggests that the abolition of, or the reduction in reliance on, wealth transfer taxes is related to the increased importance of economic growth and economic efficiency arguments in place of equity issues in discussions of tax design. More recently, Arrondel and Masson (2013) emphasize the importance of family values and intergenerational links, when the family is considered as the only truly safe investment and inheritances are seen as a reaction to uncertain social conditions created by globalizing markets and cutbacks in the welfare state. Scheve and Stasavage (2012a) propose an explanation based on an empirical model of top wealth tax rates in a large sample of countries over very long periods of time. Their explanation centers on the need for social solidarity during war.¹⁰ Solidarity is enhanced by the taxation of substantial wealth for two main reasons. Wealthier individuals are less likely to be actively engaged in fighting, thus their sacrifice can be in terms of money (taxes); and wealthier individuals own companies which produce goods, the demand for which increases due to war. They also argue that if taxes are used to repay the debt which was created to finance the war, then this solidarity effect will continue for some time. Their empirical results also suggest that the rise of wealth transfer taxation earlier on was not associated with extension of the franchise.

In a theoretical paper, Bertocchi (2011) argues that the falling reliance on wealth taxes is due to several factors, namely: (i) the historical long run decline of wealth inequality, a common long run trend among developed countries even if their degrees of wealth inequality are very

⁸ On the structural problems of estate and gift taxes in the U.S. see Pechman (2005).

⁹ In Canada, federal wealth transfer taxes were abolished in 1972, and deemed realization at death began as part of a new capital gains tax regime. Unfortunately there is no data on revenues from the deemed realization at death component of capital gains taxation. See Duff (2005) for more details on the abolition of wealth transfer taxes in Canada, Australia and New Zealand.

¹⁰ Scheve and Stasavage (2010) focus on the more general relationship between mass warfare and redistributive public policies through progressive taxation.

different; (ii) growth and the process of capital accumulation, which contributes to inequality reduction and further accelerates the decline of bequest tax rates; (iii) tax compliance - where compliance is low, as in continental European countries, bequest taxes are lower than in the U.K. and the U.S. where tax compliance is high; and, finally (iv) political institutions, especially enfranchisement which, it is predicted, is positively related to reliance on bequest tax revenue.

Bertocchi's model suggests that wealth tax revenue started growing with a wave of electoral reforms that significantly expanded the voting franchise in presence of high degrees of wealth inequality, while wealth tax reductions after 1910 can be explained by the decline of wealth income inequality and the simultaneous process of industrialization.¹¹ This argument concerning the role of the franchise is at odds with the empirical results reported by Scheve and Stasavage (2012a).

No previous empirical analysis has analyzed the role played by the demographic effect (population aging) along with the base effect, as we noted earlier. However, there is some theoretical work on the evolution of wealth taxation that emphasizes the role of age structure. Koka (2011) argues that younger populations want to tax capital more, and older ones less, because the income of young agents is especially generated from labor and because government transfers increase with age. In contrast, Mateos-Planas (2010) finds that this age effect can be dominated by a general equilibrium effect: in a younger society the return to capital and the saving rate will be higher, and (he argues) this may lead to lighter taxation of capital.

If we look at the literature on the bequest motives of individual taxpayers, with the idea that these motives will translate into voting behavior, we find more ideas that point to the importance of age structure, although these ideas have not so far been used in empirical modelling. Kopczuk (2007) estimates that about 75 percent of a representative sample of elderly single households has a desire to leave an estate with positive net worth. Much of estate planning appears to happen following the onset of terminal illness, suggesting the desire for holding on to wealth prior to the time when death becomes inevitable. Thus he suggests that people do estate planning later in life, and hence presumably worry only then about taxation of their accumulated wealth. In other words, the old are, or become, more single minded about leaving bequests, which leads to the conclusion that we should expect growing resistance to wealth transfer taxes as the population generally ages. Moreover, we can add, if parents resist more as they age, so may the growing number of their adult children who stand to benefit.¹²

Focusing on attitudes to inheritances in Britain, Rowlingson and McKay (2005) find that these attitudes show important differences by age group. People in their fifties and sixties appear to be most interested in enjoying life and they do not worry about bequests. In contrast, people in

¹¹ In countries characterized by high inequality and agrarian economic structure, such as in Latin America, autocracy can help to explain the lower significance of bequest taxes.

¹² We are grateful to Craig Brett for emphasizing this point (personal communication).

their eighties appear to be more careful with their money and say they wish to leave bequests.

In a recent comprehensive survey of work on the taxation of intergenerational transfers, Kopczuk (2013) argues that the literature as a whole has failed to identify *the* single motive for bequests. There is, it appears, a great deal of heterogeneity. From the perspective of an inquiry into how motives may translate into political action, it is of interest to note that he concludes that *control* over wealth is important to the wealthy, and this may explain why estate planning, which can in principle be used to drastically reduce tax obligations, but which typically requires giving up control, is not used to a greater extent. This is another reason why wealthy, older citizens may oppose wealth transfer taxation even though carefully planning would allow them to avoid it.

3. A conceptual framework for understanding the roles of aging and wealth in the evolution of wealth transfer taxation

We now introduce a framework in which wealth transfer taxation is regarded as one component of a fiscal system that emerges as part of a competitive political equilibrium. The modelling follows, among the others, Hettich and Winer (1999), Kenny and Winer (2006), Profeta (2007), Galli and Profeta (2009) and Winer *et al.* (2011). This framework is designed to highlight the roles of aging and the stock of household wealth, as a prelude to including these factors, along with others introduced later, in an estimating equation that can explain variation in the relative reliance on wealth transfer taxation across the G7 countries.

To simplify the analysis, we assume that the expenditure side of the budget consists of one pure public good. We also ignore interdependencies of tax and expenditure instruments other than via the government budget constraint. We do not lose much by doing so: in modern fiscal systems, the raising of taxes and the spending of tax revenues are, more or less, decided upon in separate budgetary processes, at least because it is difficult to link payments by an individual citizen to the services that he or she receives.

Consider two political parties: an incumbent government and its opposition, facing an electorate consisting of taxpayers of differing ages. Before the election takes place, the parties commit to a policy platform t , which is defined by a vector $t = (t_1, t_2, \dots, t_w, \dots, t_k)$, where t_i defines all aspects of a specific tax i ($i = 1, 2, \dots, w, \dots, k$) in the fiscal system, including its base, rate and associated special provisions such as exemptions and deductions. The vector t of taxes is defined so as to contain non-negative elements. However, particular tax instruments (such as a wealth transfer tax) may not be used, and in that case their value in the vector will be zero. As noted earlier, taxes finance the provision of a single public good G .

The choice of a fiscal policy platform by any party is subject to the same government budget constraint, $G = R(t) - C(t)$, where $R(t)$ indicates the total revenue from all fiscal sources and $C(t)$ is the total costs of administering the fiscal system.

Each party chooses the platform which continually optimizes its expected number of votes in the next election Ω . To specify this objective, we shall assume that there are just two groups of citizens-taxpayers of relatively homogeneous members: the old and the young, $h = o, y$, and let n_o and n_y indicate the number of old and young individuals respectively. Each group is characterized by a given probability σ_h of voting for the incumbent party, and by an indirect utility function $V_h(G, t)$, which influences its specific vote sensitivity s_h : $s_o = \frac{\partial \sigma_o}{\partial V_o}$ and $s_y = \frac{\partial \sigma_y}{\partial V_y}$.

Following Coughlin (1992) and Hettich and Winer (1999) and others, the total expected vote for the incumbent can be written as $\Omega = n_o s_o V_o + n_y s_y V_y$, and the expected vote for the opposition as $n_o + n_y - \Omega$.

Old and young obtain utility from the public good and disutility from taxes. In the present context, following Mulligan and Sala-i-Martin (1999), Profeta (2002) and others since, it is appropriate to also assume that tax structure has different impacts on the utility of the two groups of individuals, with the old being (relatively) single-minded with respect to taxes on wealth transfers. That is, to assume that older taxpayers are particularly averse to taxation of their planned wealth transfers. We shall see, not surprisingly, that single-mindedness with respect to wealth transfer taxation leads to reduced reliance upon this type of tax in equilibrium. This effect will be reinforced as the number of single-minded taxpayers grows with population aging.

We recall the evidence suggesting that people delay planning for bequests until late in the life-cycle (Kopczuk, 2007 and 2013). This provides one motivation for introducing single-mindedness of older taxpayers concerning inheritance taxation. A further reason is that the elderly need to be assisted by their adult children (see for example Cremer and Pestieau, 2006, among others), an effect that is likely reinforced when longevity increases. In this well-known story, the elderly want to give their children more wealth by reducing taxes on wealth transfers, in order to obtain the maximum support from their adult children. The young, in contrast, can be assumed to incur disutility from all taxes because their interests are more dispersed among their activities, i.e. they are a less cohesive group in terms of their interests.

To encapsulate single-mindedness in our model in a simple manner, we may specify indirect utilities of each age group as follows: $V_h(G, t)$ with $\frac{\partial V_h}{\partial G} > 0$, $\frac{\partial V_o}{\partial t_w} < 0$ and $\frac{\partial V_o}{\partial t_i} = 0$ for any $i \neq w$,

and $\frac{\partial V_y}{\partial t_i} < 0$ for any $i = 1, 2, \dots, w, \dots, k$.¹³

¹³ All we really need is that wealth transfer taxation be relatively more important to the old than to the young. The assumption of the partial derivative being zero for the old allows this idea to be incorporated without much loss of generality.

Characterizing the equilibrium fiscal system in the framework we have outlined can be conveniently accomplished by using the Representation Theorem for such spatial voting models (see Coughlin, 1992 and Hettich and Winer, 1999, chp 4, for details). This is a well-used mathematical method of replicating the Nash electoral equilibrium by solving an optimization problem, rather than by solving the usual simultaneous set of first order conditions for the choice of fiscal instruments that maximizes expected votes of each political party.

We proceed by stating the following problem of optimizing a synthetic political support function Ω^* , the solution to which characterizes the electoral equilibrium:

$$\max_{\{t, G\}} \Omega^* = n_o(s_o^*)V_o + n_y(s_y^*)V_y \quad \text{s.t.} \quad G = R(t) - C(t) \quad (1)$$

The basic idea behind this representation theorem is that failures to optimize political support defined across the electorate will allow opposition parties to propose a platform that promises to make some voters better off without making others worse off, thus increasing its overall electoral support. Competition insures that in an electoral equilibrium, no such opportunities effectively remain to be taken up.¹⁴ Formally speaking, the theorem works because the first order conditions for the problem in (1) are, by design, identical in general form to those each party must solve when choosing an optimal political platform.

In the problem specified in (1), a star represents a quantity which is evaluated in a Nash electoral equilibrium. In particular, s_h^* represents the weight effectively placed on group h 's welfare in the Nash electoral equilibrium. These influence weights are numbers that form part of the specification of the actual Nash equilibrium solution, and which we are using to formulate the synthetic support function. These weights encapsulate or reflect inequalities in political influence that emerge in the equilibrium. The support function, therefore, is *not* a social welfare function, since the weights on indirect utilities in it are not based on any normative principle about social welfare of the usual kind.

The first order conditions corresponding to the problem in (1) are:

$$\frac{\partial \Omega}{\partial t_i} \geq \lambda \quad \text{for any } i = 1, 2, \dots, w, \dots, k$$

$$\frac{\partial \Omega}{\partial G} = \lambda \quad (2)$$

¹⁴ The equilibrium choice of policies is Pareto efficient in this formulation. It is possible to introduce inefficiency into the equilibrium, following Hettich and Winer (1999, chp 6) and others. But we do not do so here. Unless we can add into the estimating equation such factors as misleading political advertising that underlie electoral inefficiency, data which we do not have, such an analysis does not lead to a different estimating equation.

where λ is the Lagrange multiplier associated with the budget constraint. These conditions indicate that, in the equilibrium, taxes are adjusted by any government or opposing political party until the marginal effect on political support per dollar of revenue (net of administration costs) is equalized across all fiscal instruments in use.

Note that this politically optimal platform is one in which some fiscal instrument may not actually be used. For example, if the marginal political cost per dollar of revenue associated with a small increase in t_i is greater than the marginal political benefit of another dollar of public services, the corresponding tax source will not be used in the electoral equilibrium.¹⁵

Now consider an equilibrium fiscal system of the type described above, but with just two tax instruments: a tax on wealth transfers (t_w) which we are interested in modelling empirically, and a tax (t_i) applied to some generic base i . Ignoring the possibility of an inequality in (2), the first order conditions imply that:

$$\frac{\frac{\partial \Omega}{\partial t_w}}{\frac{\partial(R-C)}{\partial t_w}} = \frac{\frac{\partial \Omega}{\partial t_i}}{\frac{\partial(R-C)}{\partial t_i}} . \quad (3)$$

Equation (3) characterizes in a general manner the equilibrium levels of taxes on wealth transfers and on the generic base. It is designed to highlight two effects which have opposing consequences for reliance on wealth transfer taxation, and which will play key roles in the empirical work presented in the following section of the paper:

(i) *the demographic effect: when older voters are more numerous, reliance on the wealth transfer tax decreases.* Because of single-mindedness of the elderly, the disutility from the wealth tax depends on the number of elderly, while the disutility from the alternative does not. Thus, as n_o increases, only the disutility from the wealth tax gets bigger. This raises the numerator on left side of (3) for given revenue from each tax source. In the new equilibrium (after population aging), wealth transfer tax revenue will decrease relative to total revenue in the electoral equilibrium.

(ii) *the base effect: when household wealth increases, reliance on the wealth tax increases.* When household wealth becomes greater, given the base of the alternative tax, the numerator on the left side declines because the marginal excess burden of the tax does at given tax rates. Marginal political opposition to a tax may also be reduced, given fixed costs of political action, as the existing tax is spread over a larger domain of economic activity. Also, marginal net revenue from increasing the tax rate on this growing base may become larger. The left side of (3) is consequently reduced, and competition then leads every party to increase reliance on the

¹⁵ We shall see in the simulations presented later that some wealth transfer taxes may disappear as they become politically useless relative to other policy instruments.

wealth tax.

The simple model we have outlined has several limitations, some of which we can allow for in our empirical implementation that follows in section five. First, we have only considered a partition of the electorate into young and old voters. Adding in children, of the old and of the young, will generate an additional reason for reduced reliance on wealth transfer taxation at each point in time as the children of the older generation increase in relative size with population aging. These are the recipients of bequests who have relatively little interest in wealth taxation.

Second, we did not include a distribution of wealth in the model. Adding this feature would greatly complicate it. Considering old and young taxpayers with and without large stocks of wealth would allow for the effect suggested by Alvaredo *et al.* (2013), namely that the less wealthy want more wealth taxation as inheritances become more important in wealth transmission.

Looking ahead to empirical implementation of the model, we note that it is reasonable to expect that the effect of the growing number of older children who will be recipients of inheritances can be captured by a variable representing the aging of the population, which will be included in the estimating equation. Regarding the possibly growing importance of wealth transfers in wealth transmission and the consequences of this for the electoral equilibrium, we can include in the equation the difference between the interest rate and the growth rate ($r-g$), which is a positive indicator of the role of inherited wealth in a society (Piketty and Saez, 2012; Piketty, 2014).¹⁶

4. Descriptive trends for the G7 countries

Before we turn to specification and estimation of an empirical model that incorporates the ideas highlighted by the framework outlined above, it is useful to take a close look at the data using descriptive methods.

The role of wealth transfer taxation - that is, the taxation of estates, inherited wealth and bequests - has been declining in many, though not all countries in the developed world since the end of World War II, though our data used in empirical work and shown in the following figures dates from 1965. Figures 1a to 1i, for the G7 countries – respectively, Canada, Italy, the U.K., the U.S., France, Germany and Japan - illustrate the post-1965 decline in wealth transfer taxation in the first four of these countries. They also show the rise in the importance of such taxation in France and Germany, and its rising and falling pattern in Japan.

¹⁶ Ancillary estimation results (available upon request) show a positive and statistically significant correlation of $r-g$ with wealth taxation relative to GDP in our sample.

[FIGURES 1a-1i]

The evolution of both household wealth over time and of population aging in G7 countries are illustrated in Figures 2 and 3. It should be noted that while demographic aging characterizes all of the countries, its precise profile varies across the G7.

[FIGURES 2 and 3]

In Canada, Italy, the U.K. and the U.S. the reduction of wealth transfer taxes appears to go hand in hand with the increase in the share of people aged 65 and above in total population and the rise of household wealth. However, in France and Germany wealth transfer taxes show an increasing trend over the 1965 – 2009 period. In these two countries the growth of household wealth combines with an aging process that is less pronounced than the one observed in the other countries. The average annual growth rate of the share of the old in the total population is 0.75% in France and 1.27% in Germany, while for example it reaches 2.96% in Japan and 1.64% in Italy.¹⁷ Finally, in Japan the rising and falling pattern of wealth transfer tax revenue appears to mirror the fact that the growth of the share of people aged 65 and above in the total population is higher from the beginning of the 1990s to 2009 than from 1965 to the beginning of the 1990s, while at the same time the opposite pattern characterizes household net wealth.

To sum up the content of these figures, we may say at first glance that in some countries - Canada, Italy, the U.K., the U.S. and Japan until the early 1990s - the negative demographic effect identified in the theoretical model outlined earlier may dominate the positive base effect in explaining reliance on wealth transfer taxation. In other countries however - France, Germany and Japan after the mid-1990s - the demographic effect appears to be substantially offset by the base effect. Whether these patterns carry over to the empirical model that follows remains to be seen.

It is also useful to consider the correlations by country of top inheritance tax rates (from Scheve and Stasavage, 2012b) with wealth tax revenue relative to GDP or to total tax revenue. These correlations are given in Table 1. Setting aside those for Canada which are biased by the absence of data on the deemed realization at death part of capital gains taxation which, it may be argued, is a partial substitute for federal death duties that were abolished in 1972, it appears that top tax rates are only somewhat related to wealth tax revenues, especially in Germany and Japan. This suggests that top rates, which few taxpayers will actually pay, may at least partly reflect expressions of social objectives rather than, or in addition to, hard-nosed revenue raising objectives.

[Table 1]

Finally, Table 2 provides a snapshot of the corresponding wealth transfer tax structures in the

¹⁷ Only the U.S. and the U.K. have an average annual growth rate of the share of the old over the total population lower than the one of France and Germany respectively.

G7 countries. It illustrates the variety and complexity of wealth transfer tax structures, all of which include the specification of a base, a rate structure on that base and numerous and complicated special provisions – what Hettich and Winer (1999) refer to as the tax skeleton. When thinking about how to implement an empirical model, it is important to note, as Table 2 illustrates, that taxation of inheritances and bequests is not only, or even mostly, about the specification of a standard nominal tax rate.

[Table 2]

5. An empirical model explaining relative reliance on wealth transfer taxation in the G7 countries, 1965 - 2009

The empirical model of wealth transfer taxation that we shall present deals with the post - World War II era in developed, democratic (G7) countries, over a period from 1965 to 2009 when the franchise is more or less fully extended. Thus unlike the interesting work of Scheve and Stasavage (2012a), we do not consider the role of war or the extension of the franchise as factors underlying wealth taxation. The choice of G7 countries stems from the need to measure the stock of household wealth which we use as a proxy for the size of the wealth transfer tax base.

We recall from the figures discussed in the previous section that the G7 after 1965 includes countries where reliance on wealth transfer taxation has been decreasing steadily, as well as countries in which it has been increasing or fluctuating, so there is considerable action in this cross-country variation to be explained. The sample period is also characterized by both a substantial increase in the mobility of capital, making it increasingly easier, in principle at least, to avoid taxation of inheritances and bequests, and by demographic aging in all of the G7 countries which, however, differs across countries in its precise profile.

The specification of the empirical model follows Hettich and Winer (1999), Kenny and Winer (2006), Profeta and Scabrosetti (2010) and Winer *et al.* (2011). In this view, embodied in the framework presented in section three, reliance on wealth transfer taxation is just one part of the fiscal system which emerges along with other aspects of policy choices in the political equilibrium of each country in the sample. Although we estimate only one equation explaining the role of wealth transfer taxation in the tax system, the equation should be thought of as one part of a reduced form that encompasses a full set of equilibrium fiscal policy choices. The equation must be specified accordingly.

The dependent variable in our regressions is alternatively, wealth transfer taxation (of estates, inheritances and gifts or bequests) relative to GDP; wealth transfer taxation as share of total tax revenue; wealth transfer taxation relative to GDP averaged over five year intervals (to remove macroeconomic fluctuations); and nominal top inheritance tax rates from the data set supplied by Scheve and Stasavage (2012b). We note that in view of the complexity of the wealth transfer tax skeleton (see again Table 2), the use of a nominal tax rate alone is not more desirable as a

dependent variable than a revenue based measure. Nominal rates do not reflect the complexity of modern taxation including its administration, and do not capture adequately movements in effective rates of tax on any base due to changing deductions and exemptions, or developments in the definition of the standard base itself.

Consistency with the view that all tax sources are part of an equilibrium fiscal system leads to incorporation of the following types of explanatory variables into an estimating equation explaining relative reliance on wealth transfer taxation:¹⁸

- *variables directly related to wealth transfer taxation*: This includes household net wealth, which is a proxy for the tax base; the population share of people aged 65 and above, which is a proxy for resistance to wealth transfer taxation by parents and their adult children; an 'erosion of solidarity index' after World War II, as suggested by Scheve and Stasavage (2012a);¹⁹ and the proportion of the labor force in agriculture since it is particularly hard to tax the wealth of farmers. As suggested by Bertocchi (2011) this last variable may also be considered to be a (perhaps rough) proxy for the effects of the process of capital accumulation which alters inequality in wealth. Along this same line of thought, we may allow for the varying role of wealth transfers in wealth transmission and the consequences of this for the electoral equilibrium by including the difference between the interest rate and the growth rate ($r-g$) which is a positive indicator of the role of inherited wealth in a society (Piketty and Saez 2012; Piketty 2014).²⁰
- *variables appearing because inheritance taxation is one tax in a fiscal system*: Here we include factors affecting the size of other tax bases, as in Kenny and Winer (2006). They are real GDP per head (the base for personal income tax); the log of population density (related directly to property taxation as an alternative source); natural resources (i.e. the sum of oil rents, natural gas rents, coal rents, mineral rents, and forest rents as a percentage of GDP), again as an alternative tax source; and the ratio of public expenditure over GDP, as a measure of the scale of government size which, Hettich and Winer (1999) argue, may affect the (possibly non-linear in size) political costs of relying on any particular tax;
- *variables related to other policy instruments, of which taxation is only one type in the full general equilibrium policy system*: This category includes trade union density, reflecting the use of regulations and labor market policies instead of taxation to redistribute;²¹

¹⁸ See the data appendix for details of all data sources. Appendix Table 1 presents the summary statistics of all relevant variables for the 1965-2009 period.

¹⁹ In order to capture the post-1945 erosion of solidarity, we build a linear time trend as follows: for each country, in 1945 this index takes a value which correspond to the total number of deaths related to the war (<http://www.secondworldwarhistory.com/world-war-2-statistics.asp>), and then it linearly goes to zero in 1975. In other words, after thirty years, solidarity is assumed to become less and less relevant.

²⁰ Ancillary estimation results (available upon request) show a positive and statistically significant correlation of $r-g$ with wealth taxation relative to GDP in our sample.

²¹ See Kolnick and Anderson (2009) and Tan (2011).

- *variables which allow us to take into account the fact that each country has to make policy choices in an international context in which capital incomes are becoming more mobile*: Here we include the sum of exports and imports of goods and services as a share of GDP as a measure of openness of the economy; or, alternatively, the KOF globalization index and/or net foreign direct investment outflows over GDP;²²
- *and finally, a variable reflecting general political pressure for redistribution as a characteristic of the electoral system as whole*: We use alternative measures of the ideological position of the political party in office, which we assume is related to attempts at redistribution, with left parties more likely to adopt more progressive features in the tax system.²³

The general form of the basic estimating equation that encapsulates all of these effects is:

$$Y_{it} = \alpha_i + \beta_t + \gamma \text{ household_wealth}_{it-2} + \delta \text{ population_over65}_{it-2} + \text{controls}_{it-2} + \varepsilon_{it} \quad (4)$$

where Y_{it} is the share of wealth transfer taxes over GDP in country i in year t (or another measure of wealth transfer taxation as outlined above), α_i is a country fixed effect and β_t is a year fixed effect.²⁴

It seems reasonable to use two-period lags for the explanatory variables we include as regressors in our specifications, since tax revenue are typically reported with a lag of a year and the effects of the independent variables on revenue are likely not immediate for various reasons. Since the error term might be serially correlated within countries (even after controlling for country fixed effects) and thus wrongly inflate the precision of our estimates, for all specifications we cluster the standard errors at the country level (see Bertrand *et al.*, 2004).

To limit omitted variables bias, we estimate regressions with country and time fixed effects.

We are aware of the reverse causality problem concerning household wealth and the taxation of wealth transfers. The issue of endogeneity of wealth and its correlation with the other regressors is a problem that is common to several studies focused on the determinants of tax design (see Profeta *et al.*, 2013).²⁵ While the use of lagged right side variables in (4) may

²² The international openness variable can be also considered to be a proxy for the degree of international tax competition.

²³ In particular we are controlling for the left (right) cabinet portfolios as percentage of all cabinet portfolios, left (right) government party seats as percentage of all legislative seats, left (right) party legislative seats as percentage of all legislative seats and finally left (right) party votes as percentage of total votes.

²⁴ Of course household wealth is accumulated over years, but we are not able to identify the underlying process of accumulation in this paper. It could be interesting to perform a dynamic analysis of wealth transfer tax revenues related to the accumulation process of household wealth. We will leave this to future research.

²⁵ The use of lagged variables may provide a modest solution to the endogeneity issue, but we cannot provide a test of this possibility.

provide a modest solution to the problem, we do not consider it definitive. Since an instrumental variable for wealth is not available, we rely upon cointegration and super-consistency of the OLS estimators.

To do so, we start by checking stationarity of our variables in order to exclude the case of spurious regressions which arises when both the dependent and the explanatory variable(s) are non-stationary. We perform the Im-Pesaran-Shin unit-root test (Im *et al.* 2003) and, as shown in Table 3, we find that our dependent variable - wealth tax revenue over GDP - is stationary, while our independent variables of interest – namely household wealth and the percent of the population over 65 - are non-stationary (integrated of order one). More precisely, with or without a time trend and using various lag lengths, the test indicates that our dependent variable does not contain an unit root, while our main independent variables are I(1).

[Table 3]

The case of a stationary dependent variable being explained by non-stationary regressors is considered by Pagan and Wickens (1989) and Baffes (1997). In this situation, at least two of the variables on the right side must be integrated of order one, a condition which the models with wealth and the demographic variable on the right hand side satisfy. We therefore proceed to estimation, testing for cointegration of our estimated equations by considering the stationarity of the regression residuals and of the predicted values of the regression models.

6. Basic estimation results

Our baseline results using as dependent variable wealth transfer taxation relative to GDP are shown in Tables 4a-c, where in each column we stack the regression output by enlarging the set of control variables step by step. In assessing these results, one should keep in mind the varied history of wealth transfer taxation in the sample we are exploring, where actual reliance on this form of taxation is not universally or uniformly declining over time.

[Tables 4a-c]

We note that as indicated by the test statistics for stationarity, with or without a time trend and at various lag lengths, both residuals and predicted values are stationary.

The estimation results in these tables show that household net wealth is significantly and positively correlated with wealth transfer taxes as a percent of GDP. Moreover, the share of people aged 65 and above is significantly and negatively correlated with inheritance taxation as a percent of GDP. These are the only statistically significant variables in all of the equations. We consider the quantitative importance of these two determinants in section eight.

The solidarity index has its expected positive effect on inheritance taxation: that is, as social solidarity declines after World War II (an assumption we have made in constructing the

solidarity index), reliance on wealth transfer taxation declines. But this factor is not always significant. The same is true for the role of real GDP per capita which represents the income tax base. Population density is negatively and significantly correlated with wealth transfer tax revenue, suggesting reduced reliance on wealth transfer taxes as the property tax base grows, but only when we control for the ideological position of the political party in office. Finally, the openness of the economy, when measured by the KOF globalization index, has a positive and significant effect on reliance on wealth transfer taxation. This last result hints at the possibility that inheritance taxation is, to some extent, a *substitute* for reduced reliance on capital income taxation which has been declining in the G7 countries in this period.

7. Robustness

Robustness of the results in Tables 4 is investigated in the following manner:

1) The models above are replicated using as an alternative dependent variable, the share of wealth transfer taxes relative to total tax revenue (see Table 5). Results concerning the role of household net wealth, and the share of people aged 65 remain the same as reported earlier.

[Table 5]

2) To control for the possible effect of macroeconomic fluctuations on revenue structure, we define all variables as averages over 5 year intervals (see Table 6). Again, the main results concerning the roles of household net wealth and the share of the population aged 65 remain essentially unchanged.

[Table 6]

3) Finally, we use as the dependent variable the top inheritance tax rate (Scheve and Stasavage 2012b).²⁶ As shown in Table 7, both household net wealth and the share of people aged 65 then have their expected, respectively positive and negative signs (as in previous tables), but are not statistically significant. The (erosion of) solidarity index, which is declining as World War II becomes more distant, leads to less wealth transfer taxation as before, but now it is statistically significant, though only in the first two specifications. Also, in equations explaining top rates, real GDP has its expected negative effect, indicating that top wealth tax rates are reduced as the size of the income tax base grows.

The difference in results between Table 7 that rely upon top tax rates and those using revenue relative to GDP or to total revenue may be due to the symbolic aspect of the choice of top rates, which few people actually pay. It may also be due to the failure of top nominal rates to reflect other important aspects of the tax skeleton.

²⁶ Top inheritance tax rates are defined as follows: the top rate applied to a single descendant who receives an inheritance in cash. In this case, due to data availability, the time period investigated is from 1960 to 2000.

[Table 7]

8. Aging and wealth transfer taxation: some simulations

To complete the empirical analysis, in this section we simulate the changes in wealth transfer taxes that may be expected to accompany future developments in demographic structure and in household wealth. The aging of population can be expected to contribute to a decline in reliance on wealth transfer taxes. However, if the upward trend in household wealth which we have observed over the last decades continues, the effect of aging may be, at least in part, offset. The simulation exercise incorporates projections of aging and of household wealth accumulation. It is based on use of the results provided in Table 4a, column 7.²⁷ Our predictions are relevant not only to understanding the relative quantitative importance of the two key factors we have pointed to, but also to get a sense of the political feasibility of using wealth transfer taxes to preserve equity in the tax system over the next few decades.

We start with simulations related only to aging of populations in the G7 countries. Projections of expected aging of population in the future are available from several international sources. In our simulation exercise we use U.N. projections of the percent of populations over 65 for each country for 2015, 2020, 2025 and 2030, keeping other variables at their 2009 values. We then compute a predicted value of wealth transfer tax revenue (relative to GDP), and if a predicted value turns out to be negative in any forecast, the predicted figure is replaced with a zero. The predictions, and their 95% confidence intervals, are reported in column 1 of Table 8. Generally speaking, the predicted extent of reliance on wealth transfer taxes indicates that such taxes will disappear in most countries, with the exception of Japan and the U.K. where, however, they show a strong declining trend. In Germany and in Italy, wealth taxes will go to zero by 2022, while in the U.S. wealth taxes are predicted to disappear by 2017.²⁸ The upper bounds of the confidence intervals show some increase in the predicted levels (relative to the 2009 levels). However, the predicted lower bound here is actually negative, representing a pressure for movement away from the 2009 level to other tax sources.²⁹

[Table 8]

We then include the role of changes in household net wealth in our simulation exercise. To predict the value of household net wealth in the future is a difficult task. We first take the following simple approach to building household net wealth values for 2015, 2020, 2025 and 2030: we regress the stock of household wealth on lagged household wealth to obtain a coefficient which we then use to predict the change in household wealth into the future. These predicted values of household wealth, together with the U.N. estimated values of the share of

²⁷ We note that the general nature of the results reported below continue to hold when other specifications from Table 4a are employed.

²⁸ Due to the absence of data in deemed realization at death which replaced death duties in 1972, we are not considering Canada in our predictions.

²⁹ This is not reflected in Table 8 which truncates the predicted values at zero.

the elderly in the population, are then both used to predict wealth transfer taxes over GDP, with other independent variables held at their 2009 values. Predictions of reliance on wealth transfer taxation are again made, this time as a result of expected developments in both aging *and* household net wealth. Negative predicted values and confidence bounds are replaced with zero.

The pronounced declining trend in reliance on wealth taxation which we observed in column 1 of Table 8 is again confirmed. However, as expected, these figures show a somewhat slower decline in reliance on wealth transfer taxation in the future due to the fact that larger stocks of wealth lead to increased emphasis on wealth transfers as a tax base.³⁰

As an alternative to the simulations using wealth as well as projected aging in Table 8 (column 2), we predict household net wealth by assuming annual wealth growth rates in the interval [-3%;+3%], and again project wealth transfer taxation into the future. Results of these simulations are not shown here. (They are available upon request). This method of forecasting future wealth leads to the same pattern of results as in column 2 of Table 8.

Lower and upper bounds on the forecasts of course add uncertainty about the future: according to the upper bound forecasts, a positive level of wealth transfer taxes may still be an option.³¹ However, the predicted lower bounds, shown in Table 8 as zero, are actually negative, representing a pressure for movement away from the 2009 level to other tax sources. And since the conditional mean of predicted values minimizes the mean squared error of the forecasts, and this conditional mean is typically zero, a sensible prediction is that wealth transfer taxes will largely disappear over the next two decades.

As a whole, the forecasts suggest that a substantial increase in reliance on wealth transfer taxes is unlikely to be politically feasible over the next twenty years or so.

9. Conclusions

The empirical analysis of the factors underlying reliance on the taxation of inherited wealth in the G7 countries over the 1965 to 2009 period that we have developed emphasizes the roles of population aging and the level of household wealth. The relevance of wealth transfer taxation is negatively and significantly related to aging of the electorate, represented in our empirical models by the percent of the population over 65. The coefficient on aging is robustly estimated, even when other factors, suggested by the literature as being potentially important

³⁰ Looking at Japan, when we consider both the demographic and the base effect we find that the demographic effect will prevail from 2017 to 2022 (i.e. we observe a reduction of wealth transfer taxes), but then the base effect will mildly prevail (i.e. we observe a small increase in wealth taxes) even if the predicted values for 2027 and 2032 are lower than the 2009 level.

³¹ Some further uncertainty is added by the fact that, like all other work on modelling the tax mix, the estimating equations cannot track the entire complexity of the tax skeleton, leading to underestimation of residual tax revenues even when a tax base is officially eliminated at some point in time, as in Canada after 1972.

for the evolution of wealth transfer taxation, are included in the empirical model.

Our results show that household wealth also matters, and that growing household wealth moves the equilibrium tax structure in the opposite direction to that of aging. However, simulations based on using projections of population aging over the next two or three decades along with projections of household wealth on balance indicate that reliance on taxation of wealth transfer taxes in the G7 countries will decline substantially over the next few decades. This is so, we predict, even in countries such as France and Germany where wealth taxation has gradually assumed a more important role since 1965.

Some caveats to this analysis, which also point to further research, may be acknowledged here. First, there is an obvious equivalency between inheritance taxation and capital income taxation that policy makers may have exploited in the past (e.g. the U.S. federal government lowered its estate tax in recent years while it raised the tax rate on realized capital gains.) This relationship may not be fully captured in our empirical work since we have not explicitly modelled capital income taxation along with reliance on inheritance taxes. Explicitly doing so would be an interesting subject for future research. Second, bequests are part of life-cycle decision making which the empirical model does not directly address. Incorporating more of this aspect of behavior into the empirical model, though perhaps a difficult task, would likely prove useful.

Notwithstanding these caveats (and others concerning empirical matters that we have raised earlier), our simulations suggest that tax designs, such as the Mirrlees Review, which rely upon the taxation of wealth transfers to preserve or enhance equity as taxation of capital incomes is further reduced are not, in this respect, realistic or politically feasible. In our view, alternative means of preserving equity in the fiscal system will be required as long as equity remains an important objective.³²

We leave the reader with the following questions, which we think that our analysis as a whole brings forward. Should the withering away of wealth transfer taxation which our model predicts motivate changes in tax design in the face of the declining importance of the taxation of capital income? More generally, should considerations of political feasibility play a role in the drawing up of tax blueprints and, if so, how and to what extent?

Finally, we conclude by restating the view presented earlier, that if politicians end up choosing from a tax designer's optimized menu, leaving aside an important component (as McLure feared in preparing his report for President Reagan), the original tax design is no longer relevant in a basic sense.

³² It is possible that the introduction or enhancement of deemed realization at death or some sort of carryover regime may partly substitute for the decline in explicit wealth transfer taxation. So would a move towards some kind of global capital income tax, though that is probably a more distant possibility.

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Appendix

Mnemonics and Data Sources

- **Wealth_tax/tax_revenue**: estate, inheritance and gift taxes divided by total tax revenue (OECD Statistics, various years);
- **Wealth_tax/GDP**: estate, inheritance and gift taxes divided by GDP (OECD Statistics, various years);
- **Top inheritance tax rates**: the top rate applied to a single descendant who receives an inheritance in cash (Scheve and Stasavage, 2012b);
- **Household_wealth**: household net wealth (OECD, 2010 and earlier issues);
- **Population_over65**: population aged 65 and above as a percentage of the total population. Population is based on the de facto definition of population, which counts all residents regardless of legal status or citizenship{except for refugees not permanently settled in the country of asylum, who are generally considered part of the population of the country of origin (World Bank Development Indicators, various years);
- **Real_gdp**: real GDP per capita (OECD Statistics, various years);
- **Public_expenditure/GDP**: public expenditure over GDP (OECD Statistics, various years);
- **Population_density**: population density is midyear population divided by land area in square kilometers. Population is based on the de facto definition of population, which counts all residents regardless of legal status or citizenship--except for refugees not permanently settled in the country of asylum, who are generally considered part of the population of their country of origin. Land area is a country's total area, excluding area under inland water bodies, national claims to continental shelf, and exclusive economic zones. In most cases the definition of inland water bodies includes major rivers and lakes (World Bank Open Data);
- **Openness**: the sum of exports and imports divided by GDP. This indicator measures a country's "openness" or "integration" in the world economy. It represents the combined weight of total trade in its economy, a measure of the degree of dependence of domestic producers on foreign markets and their trade orientation (for exports) and the degree of reliance of domestic demand on foreign supply of goods and services (for imports) (OECD Statistics, various years);
- **Union_density**: trade union density corresponds to the ratio of wage and salary earners that are trade union members, divided by the total number of wage and salary earners (OECD Labor Force Statistics). Density is calculated using survey data, wherever possible, and administrative data adjusted for non-active and self-employed members otherwise. Data are expressed in percentages (OECD Statistics, various years);
- **Natural_resources**: total natural resources rents (% of GDP), that is the sum of oil rents, natural gas rents, coal rents (hard and soft), mineral rents, and forest rents as a percentage of GDP (World Bank Open Data);
- **KOF_index**: KOF globalization index (<http://globalization.kof.ethz.ch/>);
- **FDI**: foreign direct investment, net outflows (% of GDP) (World Bank Open Data);

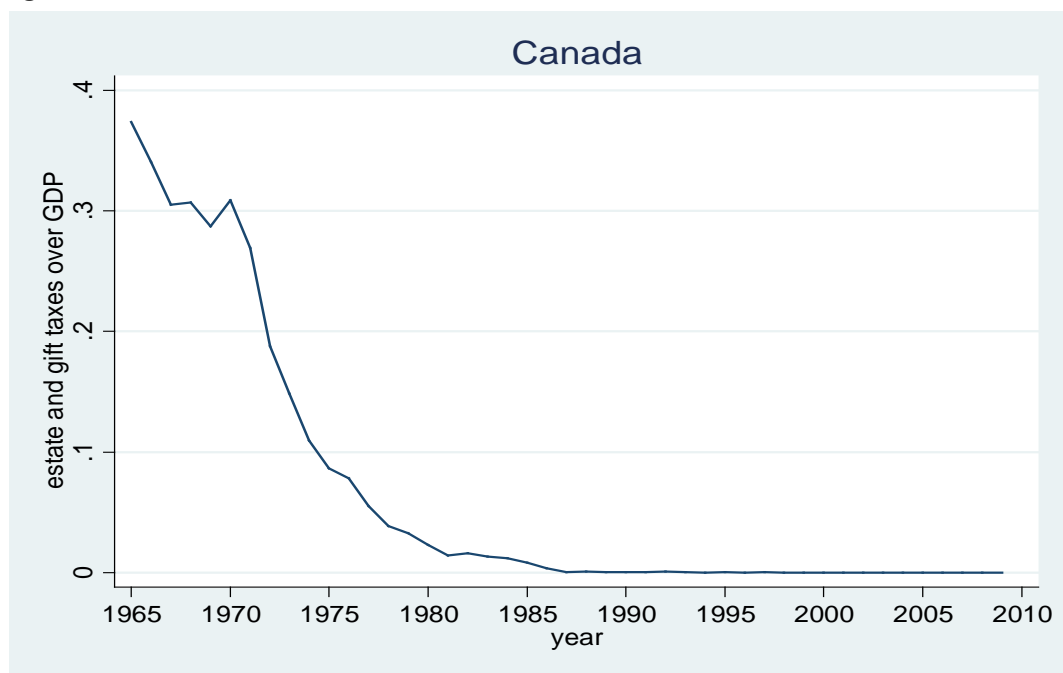
- Agr_labor_force: employment in agriculture (% of total employment) (World Bank Open Data);
- Left (right)_party_cabinet_portfolios: left (right) cabinet portfolios as percentage of all cabinet portfolios ('Electoral, Legislative and Government Strength of Political Parties by Ideological Group in Capitalistic Democracies, 1950-2006: A database' by D. Swank);
- Left (right)_government_party_seats: left (right) government party seats as percentage of all legislative seats ('Electoral, Legislative and Government Strength of Political Parties by Ideological Group in Capitalistic Democracies, 1950-2006: A database' by D. Swank);
- Left (right)_party_legislative_seats: left (right) party legislative seats as percentage of all legislative seats ('Electoral, Legislative and Government Strength of Political Parties by Ideological Group in Capitalistic Democracies, 1950-2006: A database' by D. Swank);
- Left (right)_party_votes: left (right) party votes as percentage of total votes ('Electoral, Legislative and Government Strength of Political Parties by Ideological Group in Capitalistic Democracies, 1950-2006: A database' by D. Swank).

Summary Statistics

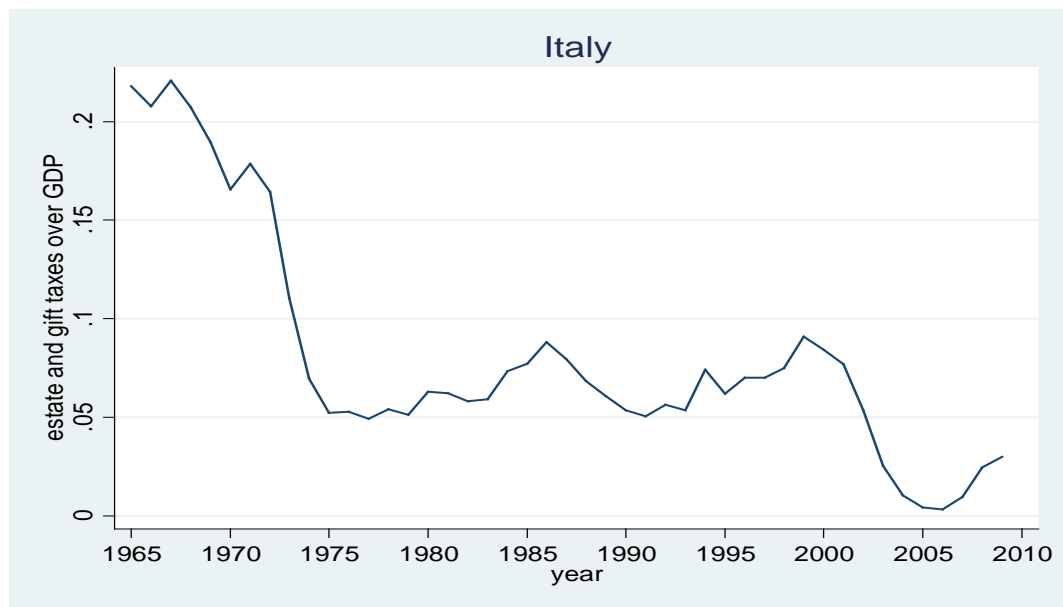
Variable	Obs	Mean	Std. Dev.	Min	Max
wealth_tax/GDP	315	.2242552	.1742538	0	.9575
wealth_tax/tax_revenue	314	.7287709	.578198	0	2.65738
top_inheritance_tax_rates	322	45.00138	25.03234	0	80
household_wealth	245	253155.3	643771.5	110.315	2403360
population_over65	371	12.7708	3.371342	5.317218	22.74724
real_gdp	280	22269.9	5634.933	11421.07	38641.99
log_population_density	343	4.404273	1.581906	.6977541	5.859484
public_expenditure/GDP	232	.4513515	.0767717	.3144673	.5896283
natural_resources	280	1.432197	2.124899	.0188577	12.52887
union_density	349	28.67991	10.0699	7.617148	50.46371
openness	340	39.74786	16.83869	9.30502	8.51725
solidarity_index	385	224821.8	716499.5	0	5152000
KOF_index	273	63.65538	13.47121	32.48	87.39
fdi	277	1.745852	2.119332	-.0304241	16.66675
agr_labor_force	204	4.396569	2.583586	1.1	14
left_party_cabinet_portfolios	399	16.401	31.49499	0	100
left_government_party_seats	399	9.39599	18.20869	0	65
left_party_legislative_seats	399	28.80451	18.7597	0	65
left_party_votes	399	30.20301	16.29707	0	56
right_party_cabinet_portfolios	399	50.2406	44.86409	0	100
right_government_party_seats	399	30.10276	26.97993	0	80
right_party_legislative_seats	399	44.14787	18.29396	3	90
right_party_votes	399	41.07519	13.96422	5	78

Correlation Matrix

	hushld wealth	pop over65	real_ gdp	log_pop density	public_exp end/GDP	natr1 resources	union density	Open Ness	KOF_ index	fdi	solidarity index
hushld_wealth	1										
pop_over65	0.157	1									
real_gdp	-0.006	0.3369	1								
log_pop_den	0.3893	0.6661	-0.042	1							
public_expend /GDP	-0.4532	0.2545	-0.2767	0.0306	1						
natr1_resources	-0.2728	-0.5635	-0.059	-0.8171	-0.0982	1					
union_density	-0.095	-0.1314	-0.4441	-0.0616	0.1657	0.2576	1				
openness	-0.4589	0.3049	0.0775	-0.1869	0.5487	0.2317	0.2384	1			
KOF_index	-0.4841	0.3771	0.524	-0.1615	0.2134	0.1531	-0.1964	0.6792	1		
fdi	-0.1892	0.2959	0.308	0.0788	0.0511	0.0189	-0.1399	0.466	0.6296	1	
solidarity_index	-0.062	-0.2176	-0.1816	-0.1154	-0.227	0.0096	0.0223	-0.242	-0.1678	-0.0931	1

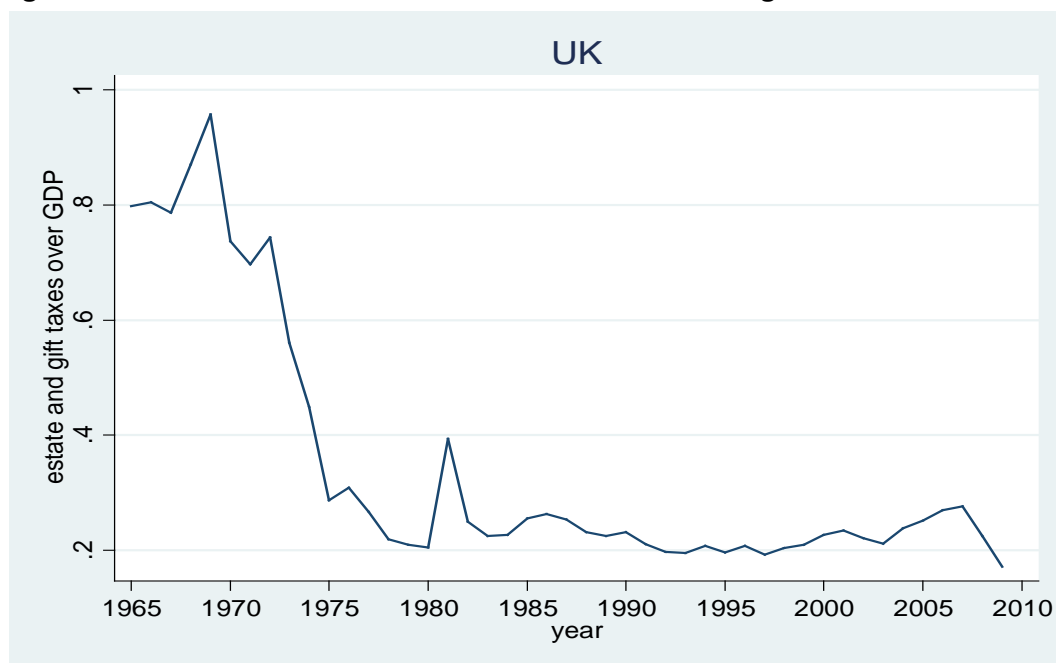
Figure 1a: Wealth transfer taxes over GDP in Canada

Source: OECD statistics and WDI

Figure 1b: Wealth transfer taxes over GDP in Italy

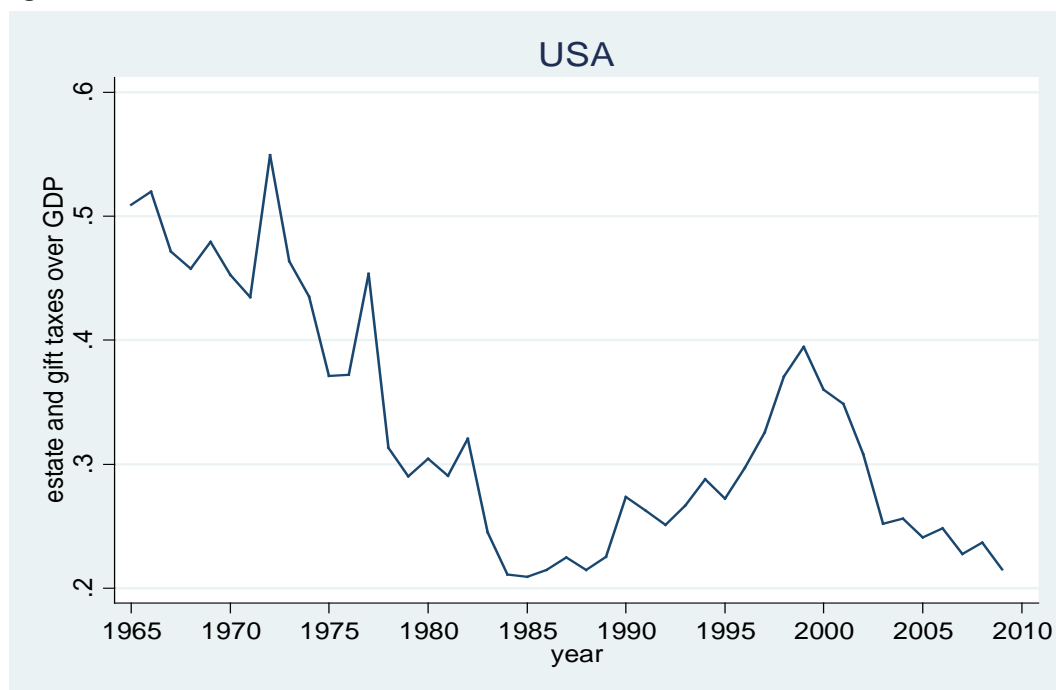
Source: OECD statistics and WDI

Figure 1c: Wealth transfer taxes over GDP in the United Kingdom



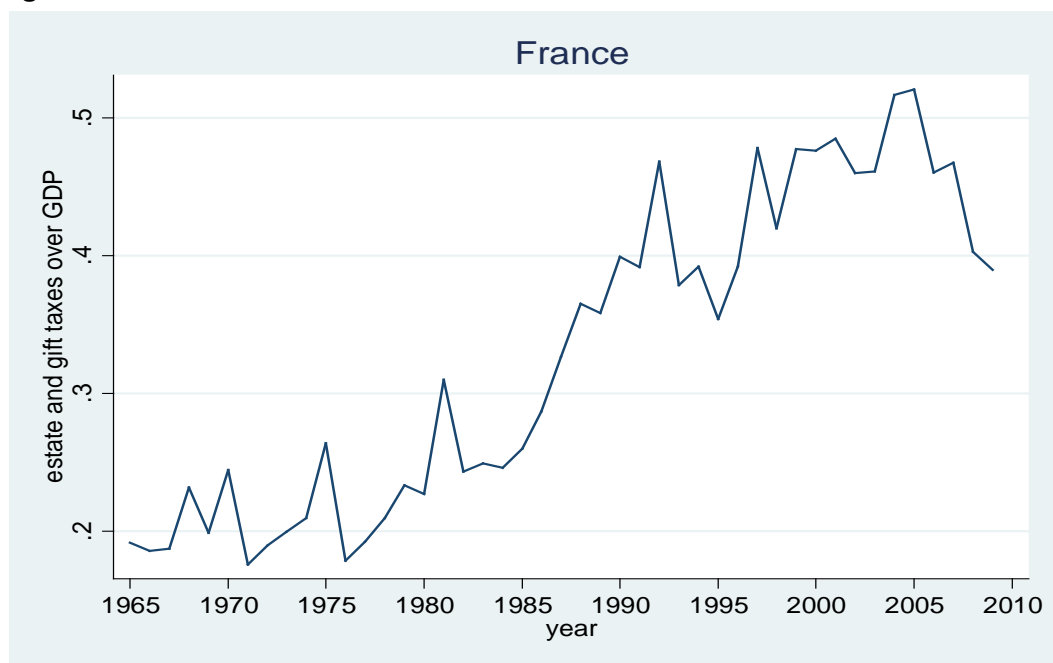
Source: OECD statistics and WDI

Figure 1d: Wealth transfer taxes over GDP in the United States



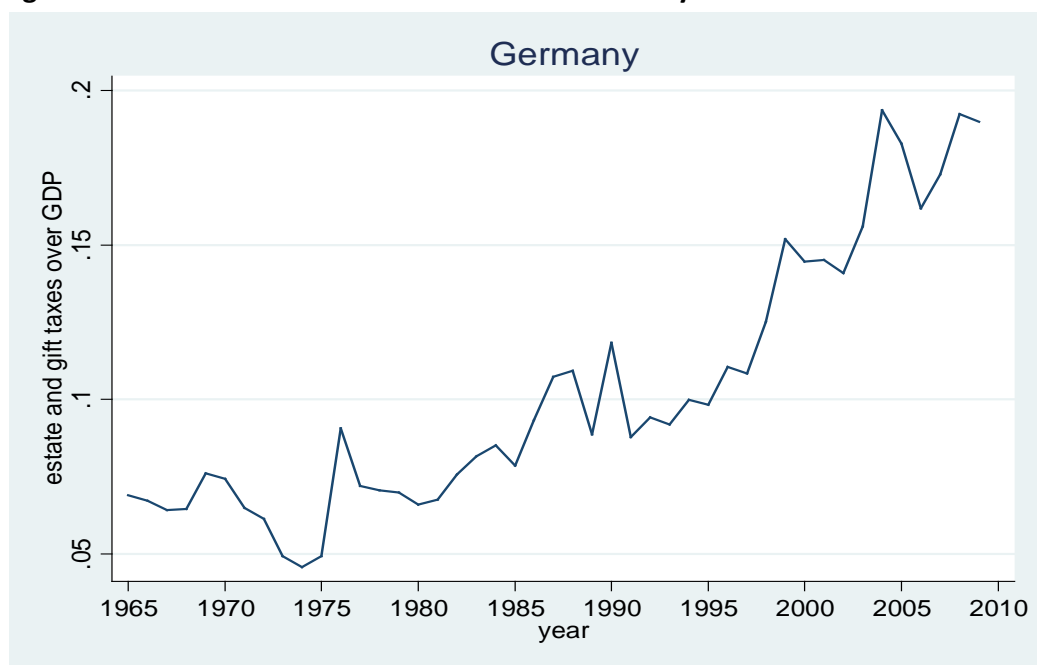
Source: OECD statistics and WDI

Figure 1e: Wealth transfer taxes over GDP in France



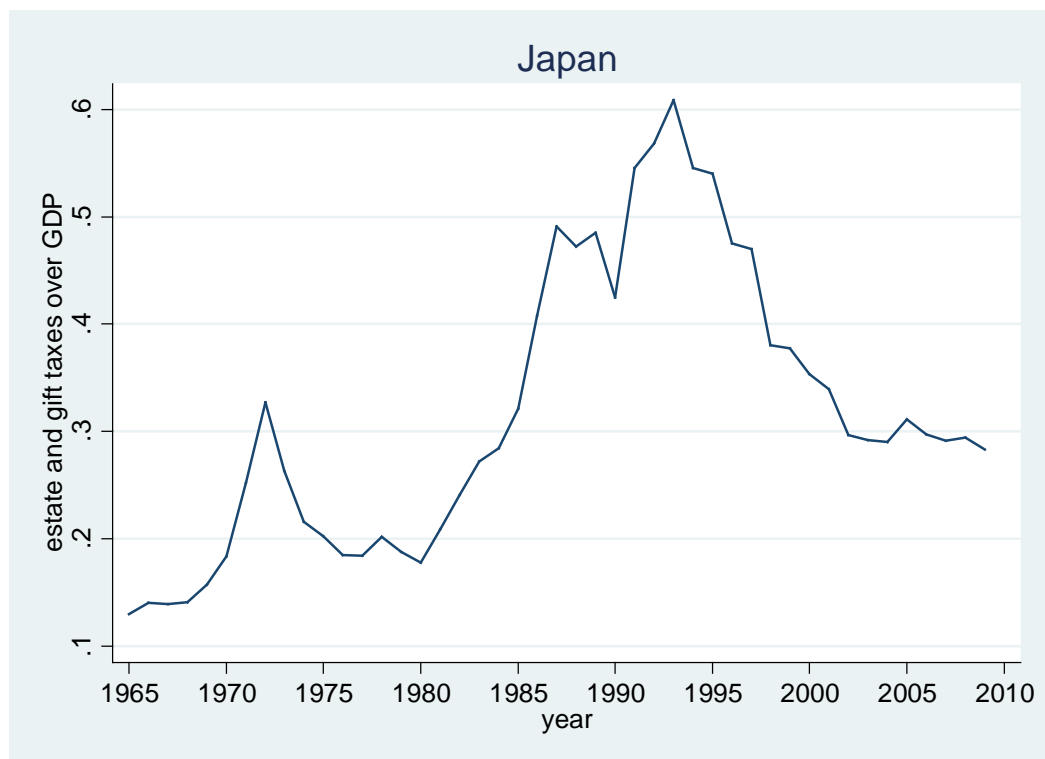
Source: OECD statistics and WDI

Figure 1f: Wealth transfer taxes over GDP in Germany



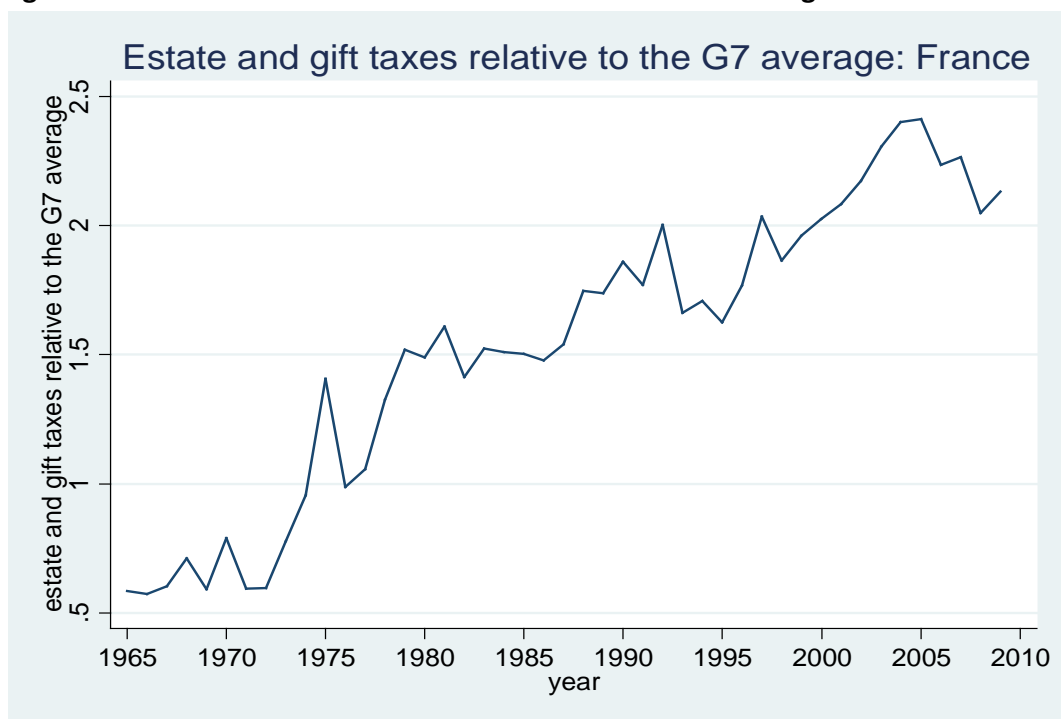
Source: OECD statistics and WDI

Figure 1g: Wealth transfer taxes over GDP in Japan



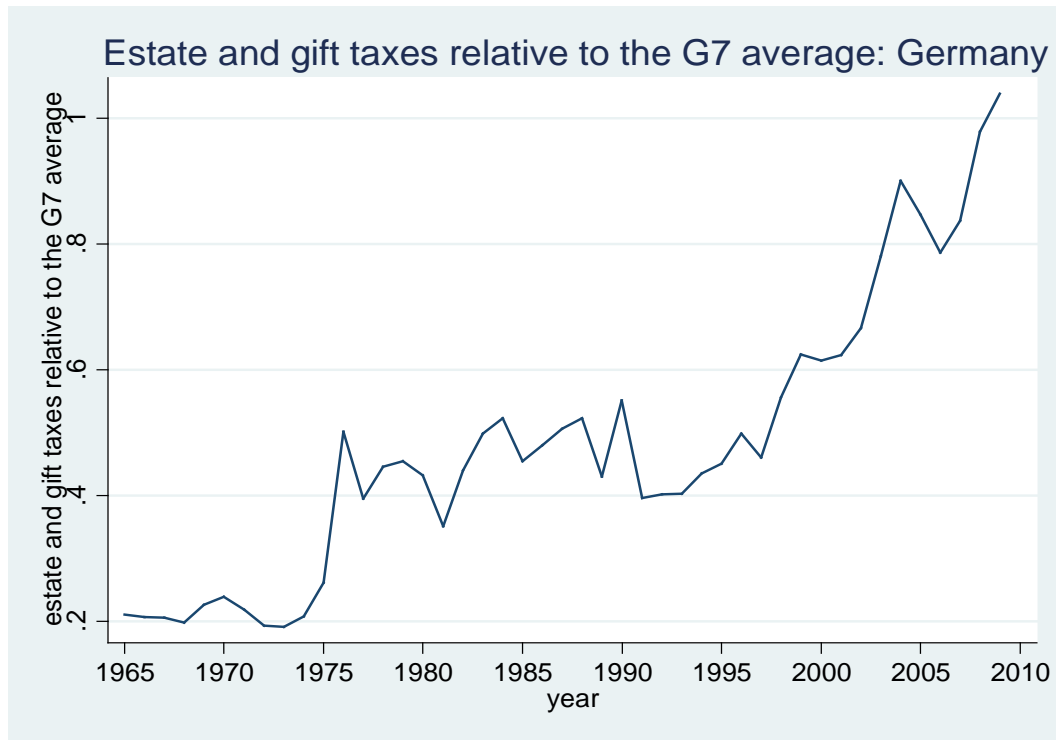
Source: OECD statistics and WDI

Figure 1h: Wealth transfer taxes over GDP relative to G7 average in France

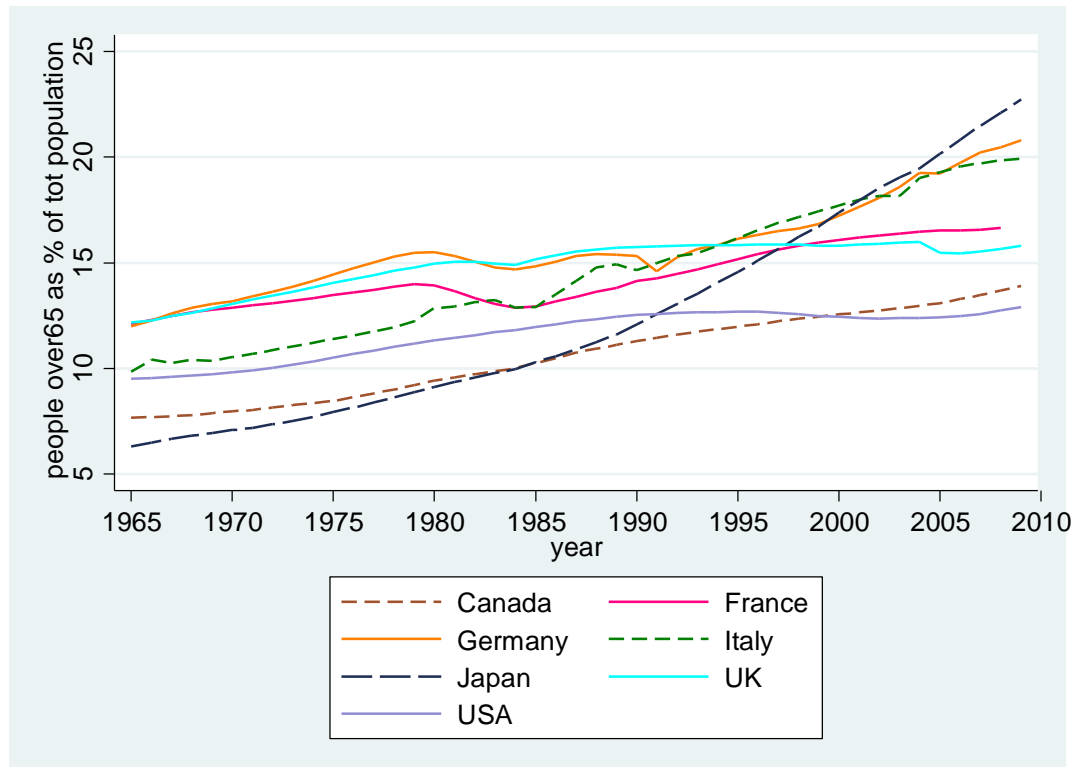


Source: OECD statistics and WDI

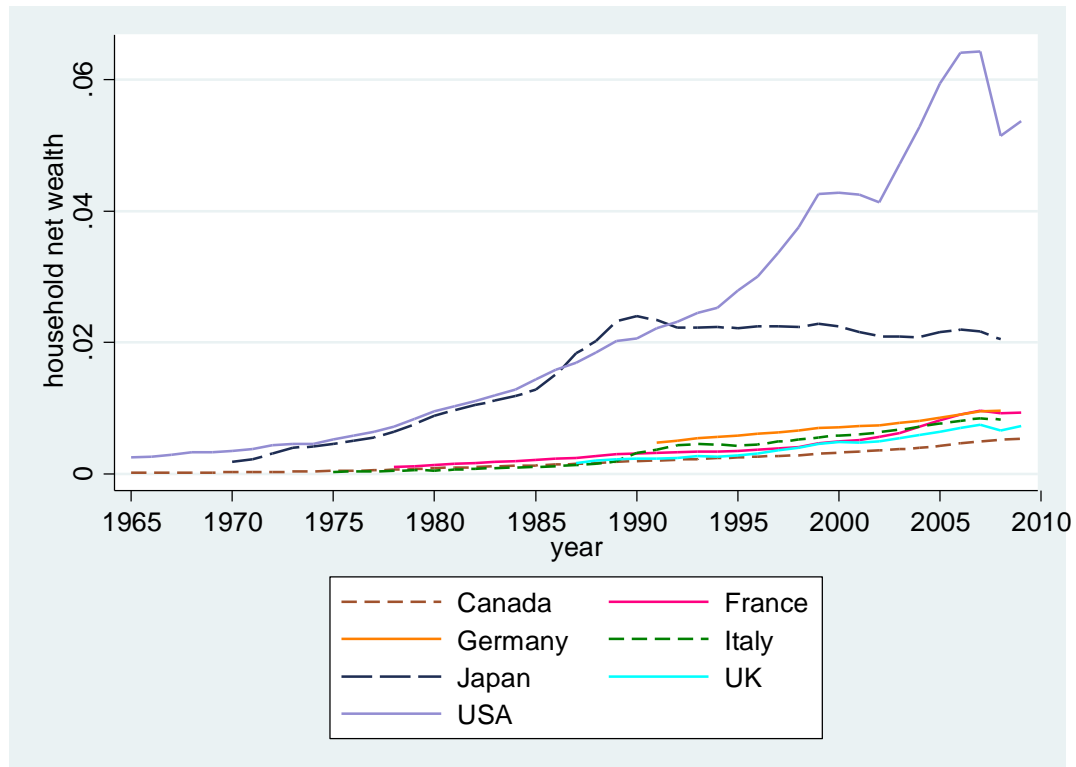
Figure 1i: Wealth transfer taxes over GDP relative to G7 average in Germany



Source: OECD statistics and WDI

Figure 2: People over 65 as % of total population – G7 countries

Source: World Bank Development Indicators (various years)

Figure 3: Household net wealth – G7 countries

Source: OECD (2010 and earlier issues)

Table 1: Correlations of wealth tax revenue (over GDP or over total tax revenue) and the top wealth transfer tax rate

Country	Correlation wealth_tax/GDP and top tax rate	Correlation wealth_tax/tax_revenue and top tax rate
Canada*	0.931	0.9338
France	0.8362	0.7654
Germany	0.347	0.2415
Italy	0.9271	0.955
Japan	-0.3205	-0.4278
UK	0.6432	0.6371
USA	0.7983	0.849
All	0.711	0.7916

Note: * The Canadian number is certainly biased upwards by the unavailability of tax stemming from deemed realization of capital gains at death introduced in 1972 when the federal death duty was abolished. The tax rate corresponding to the missing data is set at zero.

Table 2: A Snapshot of Wealth Transfer Tax Structures in the G7 Countries

	UK	USA	JAPAN	ITALY	FRANCE	GERMANY	CANADA
Name	Inheritance tax	Estate tax and gift tax	Inheritance tax and gift tax	Inheritance tax and gift tax	Inheritance tax and gift tax	Inheritance tax and gift tax	From 1987 no inheritance taxes either at Federal or provincial level. However, the income of estate properties that have been inherited is subject to income tax.
Year of introduction	1796	1916 and 1924	1905	1862 (re-introduced in 2006 after revocation in 2001)	1798	1906	Death duties abolished in 1972 and given over to the provinces, which competed them away by the mid-1980s. Deemed realization at death as part of capital gains taxation implemented.
Last reform	2010-11	2013	2013	2013	2011	2009	
Tax base	The value of estates over the threshold (nil-rate band) of £325,000	For estate tax: the value of estates over a certain threshold for gift tax: the total gifts made by the donor each year	The total market value of all properties acquired through an inheritance, a bequest or given as a gift	The value of estates over the threshold of €1,000,000 (for spouse and the immediate family) or €1,500,000 (if beneficiary is a handicapped person)	The value of estates	The value of the inheritance minus the debts of the deceased, as well as the funeral and administrative expenses, and any personal and other exemptions	Capital worldwide assets deemed sold at their fair market value
Rates	40% (may be reduced to 36% if more than 10% of the estate is left to charity)	up to 40%	10% - 50% (55% by 2015)	4% - 8%	60% (5%-45% for parents and children)	17%-50% depending on the degree of kinship with the decedent/donor of each heir or beneficiary	19.5% - 25%

Exemptions and reliefs	100% business property and agricultural property reliefs from 1992	For estate tax: marital deduction. All property that is included in the gross estate and passes to the surviving spouse. The property must pass "outright." In some cases, certain life estates also qualify for the marital deduction	Properties received by a person engaged in religious, charitable, scientific or other activities for public welfare	Reduction in taxes on real estate if beneficiary uses it as primary residence (if certain conditions are met)	For works of art, woodlands and qualifying businesses	Three relevant classes exemptions, based on the type of relationship with the decedent	Transfer of farm properties to children or grandchildren
	Exemption for gifts between spouses and civil partner (from 2005)	For estate tax: charitable deduction. If the decedent leaves property to a qualifying charity	Parents can transfer stocks to their children in any amount over many years at a low rate of tax	Exemption for medical and funeral expenses bore for the decedent	No inheritance taxes for legacies between spouses and PACS partners (but: must pay taxes for lifetime gifts)	Business assets are subject to special rules which may allow heirs, who continue a business, to reduce or even avoid inheritance tax liability	Spousal relief: taxes are deferred until one's partner sells or disposes of the assets
	Exemptions for assets passing to UK charities and political parties	For estate tax: mortgages and debt deduction	JPY10 million (US\$108,281) deduction for each statutory heir	Exemption for Government Bonds	Children & parents: 100000€ allowance each; grandchildren and great grandchildren allowances of 1594€; brothers & sisters: 15932€ (if certain conditions are met)	Lifetime gifts may reduce inheritance tax liability in Germany	Exemption up to a certain threshold on gains from the sale of shares of unquoted Canadian trading companies
	Annual exemption for £3000 gifts	For estate tax: deduction of administration expenses of the estate	JPY160 million (US\$1,732,492) deduction for the surviving spouse	Exemption for credits related to sales within 6 months before the decedent's death	Specific allowances for other relatives	Gifts made more than 10 years before the date of death are not taxable, and after 10 years the gift tax exemption can be used for another gift	Capital gains exemption: estate does not have to pay any capital gains tax on principal residence
	Small gift exemptions (£250)	For estate tax: deduction of losses during estate administration	Tax relief for taxable amount of certain residential land	Exemption for cars and motorcycles	Specific tax-free allowances are available for lifetime registered gifts and are currently renewable every fifteen years	Life insurance proceeds are not part of the estate	Charitable donations reduce the tax payable: bonds, stocks, mutual funds, and other securities may be donated. The donation of investment instruments to charities reduces the tax on capital gains by half

	Exemptions for lifetime gifts to individuals made more than 7 years before death	For estate tax: in the case of a qualifying Family Farm, a reduction from value of up to \$1,070,000. A similar deduction for a qualifying family owned business was revoked beginning in 2004	Tax credits for minors and handicapped persons	Exemption for gifts to qualified charities and public authorities	When the deceased was domiciled abroad and the recipient is equally non-resident of France the foreign securities are not subjected to inheritance taxes.	Pursuant to the LPG, spouses, partners, registered life partners and children of the deceased receive a special maintenance exemption in addition to the general tax exempt amount	Trusts may be established to shelter income and assets, subject to a 21 year rule requiring deemed disposition at this time and every 21 years afterwards.
	Wedding and civil partnership gifts (£5000 from parents, £2500 from grand-parents, £1000 from anyone else)	For gift tax: exclusion of gifts that are not more than the annual exclusion for the calendar year	Certain requirements for family business succession that allows possible extension of time to pay	Exemption for life insurances	Disabled persons may claim a deduction of 159,325 €	No inheritance tax is payable on certain estate assets	
	Value of the timber (but not the land) is excluded from estate of a woodland	For gift tax: educational and medical exclusions. Tuition or medical expenses paid for someone	Exemption of gift tax on an advanced lump-sum transfer of funds for education of lineal descendants	Exemption for qualified business succession	A reduction is granted on the amount payable if the heir has at least 3 children	A home is exempt from taxation, if the beneficiary continues to reside in the home him- or herself (no restrictions for spouses or registered partners, some conditions for children)	
	Heritage relief for assets of historic or scientific interest, if they are made available for the public to view	For gift tax: exclusion of gifts to spouse		Exemption for property owned abroad if the decedent was resident abroad	Tax-free cash gifts up to 31865€ can be made by family members (every 15 years) so long as the giver is less than 80 and the receiver is over 18	Donations and inheritance received by a domestic corporation, association, and estate which exclusively and directly serve public-benefit, charitable or religious purposes are exempt from inheritance and gift tax. The same is true for donations to foreign corporations if their state of residence retroactively exempts donations to German charitable corporations from taxation	
		For gift tax: exclusion of gifts to a political organization and to		Deduction for debts to divorced spouse of the	The value of the main home can be reduced by 20 percent for succession tax		

		qualified charities		decedent	purposes provided the property is also occupied as a main home by the surviving spouse, PACS partner, or by children of the deceased		
				Deduction for debts to public authorities	A foundation or association declared of public utility benefits from a reduced rate of 35 %, and 45 % for the part in excess of € 24,430		
Source	https://www.gov.uk/inheritance-tax/overview	http://www.irs.gov/Businesses/Small-Businesses-&Self-Employed/Estate-and-Gift-Taxes	http://www.pwc.com/jp/en/taxnews-estate-taxation/assets/2013-tax-reform-estate-taxation-e.pdf	http://www.altroconsumo.it/soldi/successioni/speciali/tasse-di-successione/2 http://www.tassefisco.com/persone-fisiche/guida-pratica-successioni-calcolo-imposta-tasse/3982/	http://www.cabinetgregory.com/FRinheritanceTax.htm http://paris.angloinfo.com/information/money/general-taxes/succession-inheritance-tax/	http://www.schweizer.com.au/articles/German_Inheritance_Taxes_%28SK00131316%29.pdf	http://www.canadafaq.ca/what+is+inheritance+tax+in+canada/ http://estatelawcanada.blogspot.it/2010/03/does-canada-have-death-taxes-or.html http://turbotax.intuit.ca/tax-resources/inheritance-tax.jsp
	UK	USA	JAPAN	ITALY	FRANCE	GERMANY	CANADA

Table 3: Panel Unit Root Test – Im, Pesaran and Shin (IPS)

IPS Test Statistics		
VARIABLE	without trend	with trend
wealth_tax/GDP	-13.60***	-14.54***
p-value	(0.0000)	(0.0000)
population_over65	4.265	1.011
p-value	(1.0000)	(0.8440)
household_wealth	5.473	1.978
p-value	(1.0000)	(0.9760)

Notes: the IPS test assumes that all series are non-stationary under the null hypothesis. *** indicates rejection of the null hypothesis at 1% level of significance.

Table 4a: The determinants of wealth transfer taxes (relative to GDP), G7 Countries, 1965 - 2009

VARIABLES	(1) wealth_tax/GDP	(2) wealth_tax/GDP	(3) wealth_tax/GDP	(4) wealth_tax/GDP	(5) wealth_tax/GDP	(6) wealth_tax/GDP	(7) wealth_tax/GDP
household_wealth(t-2)	0.207*** [8.161]	0.197*** [7.612]	0.193*** [5.373]	0.193*** [5.302]	0.189*** [5.557]	0.188*** [5.445]	0.183*** [5.580]
population_over65(t-2)	-0.0431*** [-4.662]	-0.0418*** [-5.129]	-0.0420*** [-5.400]	-0.0427*** [-5.451]	-0.0390*** [-5.783]	-0.0400*** [-6.997]	-0.0366*** [-5.824]
solidarity_index(t-2)	1.974** [3.063]	1.763* [2.283]	1.374 [0.810]	0.639 [0.454]	1.379 [1.086]	1.297 [0.765]	1.290 [1.034]
real_gdp(t-2)	-2.196 [-1.921]	-2.167* [-1.985]	-2.019 [-1.695]	-1.362 [-1.293]	-2.108 [-1.893]	-1.855 [-1.623]	-1.920 [-1.835]
log_population_density(t-2)	-0.487 [-1.417]	-0.408 [-1.086]	-0.499 [-0.994]	-0.668 [-1.625]	0.0760 [0.129]	-0.484 [-1.033]	0.110 [0.190]
public_expenditure/GDP(t-2)	-0.520 [-1.163]	-0.485 [-1.019]	-0.500 [-1.056]	-0.259 [-0.593]	-0.177 [-0.472]	-0.468 [-1.035]	-0.130 [-0.371]
natural_resources(t-2)	-	0.00548 [1.016]	0.00609 [0.827]	0.0105 [1.668]	0.00626 [0.994]	0.00589 [0.809]	0.00603 [0.986]
union_density(t-2)	-	-	0.00223 [0.278]	0.00425 [0.670]	0.000125 [0.0176]	0.00221 [0.277]	4.69e-05 [0.00670]
openness(t-2)	-	-	-	0.00249 [1.144]	-	-	-
KOF_index(t-2)	-	-	-	-	0.00621** [2.692]	-	0.00638** [2.609]
FDI(t-2)	-	-	-	-	-	0.00378 [0.780]	0.00438 [1.088]
Observations	201	201	201	201	201	201	201
Within R-squared	0.629	0.632	0.633	0.649	0.666	0.639	0.673
n clusters	7	7	7	7	7	7	7
country fixed effects	yes	yes	yes	yes	yes	yes	yes
year fixed effects	yes	yes	yes	yes	yes	yes	yes

Notes: standard errors are clustered at country level, and the corresponding t-statistics are reported in brackets below each coefficient.

*** significant at 1%; ** significant at 5%; * significant at 10%.

Table 4a: The determinants of wealth transfer taxes (relative to GDP), G7 Countries, 1965 – 2009 (cont.)

VARIABLE	IPS Test Statistics													
	(1)		(2)		(3)		(4)		(5)		(6)		(7)	
	without trend	with trend	without trend	with trend	without trend	with trend	without trend	with trend	without trend	with trend	without trend	with trend	without trend	with trend
predicted value of wealth_tax/GDP	-5.108***	-1.445*	-4.622***	-2.124**	-4.271***	-1.283*	-3.502***	-1.412*	-2.919***	-1.480*	-5.190***	-2.625***	-3.546***	-1.396*
p-value	(0.0000)	(0.0742)	(0.0000)	(0.0168)	(0.0000)	(0.0998)	(0.0002)	(0.0790)	(0.0018)	(0.0695)	(0.0000)	(0.0043)	(0.0002)	(0.0813)
error term	-1.4465*	-1.773**	-1.5485*	-1.8106**	-1.6655**	-2.0572	-2.0121**	-2.3961***	-1.8374**	-2.4379***	-1.7185**	-2.4535***	-2.184**	-2.079**
p-value	(0.0740)	(0.0381)	(0.0607)	(0.0351)	(0.0479)	(0.0198)	(0.0221)	(0.0083)	(0.0331)	(0.0074)	(0.0428)	(0.0071)	(0.0145)	(0.0188)

Notes: the IPS test assumes that all series are non-stationary under the null hypothesis. *** indicates rejection of the null hypothesis at 1% level of significance; ** at 5% level of significance; * at 10% level of significance.

Table 4b: The determinants of wealth transfer taxes (relative to GDP), G7 Countries, 1965-2009

VARIABLES	(1) wealth_tax/GDP	(2) wealth_tax/GDP	(3) wealth_tax/GDP	(4) wealth_tax/GDP	(5) wealth_tax/GDP
household_wealth (t-2)	0.142*** [4.407]	0.150*** [4.773]	0.150*** [4.741]	0.149*** [4.811]	0.145*** [4.612]
population_over65(t-2)	-0.0316*** [-4.597]	-0.0352*** [-4.230]	-0.0354*** [-4.503]	-0.0347** [-3.539]	-0.0333** [-3.652]
real_gdp(t-2)	-0.537 [-0.551]	-0.624 [-0.567]	-0.493 [-0.451]	-0.633 [-0.583]	-0.573 [-0.495]
log_population_density(t-2)	-1.568** [-2.727]	-1.595* [-2.384]	-1.669** [-2.540]	-1.585** [-2.690]	-1.631** [-2.874]
public_expenditure/GDP(t-2)	-0.725 [-1.815]	-0.652 [-1.536]	-0.652 [-1.535]	-0.654 [-1.531]	-0.686 [-1.669]
natural_resources(t-2)	0.0230 [1.824]	0.0221 [1.754]	0.0221 [1.751]	0.0223 [1.800]	0.0232 [1.850]
union_density(t-2)	0.0110 [1.032]	0.0111 [1.069]	0.0107 [1.028]	0.0112 [1.104]	0.0128 [1.293]
openness(t-2)	0.00172 [0.968]	0.00157 [1.110]	0.00176 [1.169]	0.00155 [0.998]	0.00175 [1.128]
labor_force_agriculture(t-2)	0.0419** [2.608]	0.0410* [2.285]	0.0427** [2.515]	0.0408* [2.372]	0.0409* [2.265]
left_cabinet_portfolios(t-2)	-	-4.25e-06 [-0.0172]	-	-	-
left_government_party_seats(t-2)	-	-	-0.000233 [-0.595]	-	-
left_party_legislative_seats(t-2)	-	-	-	0.000128 [0.149]	-
left_party_votes(t-2)	-	-	-	-	0.000991 [1.077]
Observations	178	171	171	171	171
Within R-squared	0.588	0.592	0.595	0.593	0.597
n clusters	7	7	7	7	7
country fixed effects	yes	yes	yes	yes	yes
year fixed effects	yes	yes	yes	yes	yes

Notes: standard errors are clustered at country level, and the corresponding t-statistics are reported in brackets below each coefficient. Results do not change if we control for the KOF index of globalization or the share of FDI instead of trade openness.

*** significant at 1%, ** significant at 5%, * significant at 10%

Table 4c: The determinants of wealth transfer taxes (relative to GDP), G7 Countries, 1965-2009

VARIABLES	(1) wealth_tax/GDP	(2) wealth_tax/GDP	(3) wealth_tax/GDP	(4) wealth_tax/GDP	(5) wealth_tax/GDP
household_wealth(t-2)	0.142*** [4.407]	0.152*** [4.967]	0.150*** [4.770]	0.155*** [4.454]	0.146*** [4.432]
population_over65(t-2)	-0.0316*** [-4.597]	-0.0363*** [-4.899]	-0.0356*** [-4.741]	-0.0348*** [-4.370]	-0.0381*** [-4.379]
real_gdp(t-2)	-0.537 [-0.551]	-0.903 [-0.874]	-0.729 [-0.719]	-0.707 [-0.610]	-0.474 [-0.452]
log_population_density(t-2)	-1.568** [-2.727]	-1.488* [-2.373]	-1.567** [-2.627]	-1.546** [-2.488]	-1.670** [-2.975]
public_expenditure/GDP(t-2)	-0.725 [-1.815]	-0.635 [-1.603]	-0.648 [-1.574]	-0.645 [-1.390]	-0.690 [-1.896]
natural_resources(t-2)	0.0230 [1.824]	0.0188 [1.424]	0.0205 [1.509]	0.0244* [2.104]	0.0180 [1.741]
union_density(t-2)	0.0110 [1.032]	0.0113 [1.087]	0.0114 [1.093]	0.00996 [0.882]	0.0127 [1.179]
openness(t-2)	0.00172 [0.968]	0.00109 [0.647]	0.00133 [0.814]	0.00187 [1.460]	0.00157 [0.808]
labor_force_agriculture(t-2)	0.0419** [2.608]	0.0349 [1.901]	0.0387* [2.187]	0.0452** [3.180]	0.0296* [2.040]
right_cabinet_portfolios(t-2)	-	-0.000184 [-0.784]	-	-	-
right_government_party_seats(t-2)	-	-	-0.000141 [-0.403]	-	-
right_party_legislative_seats(t-2)	-	-	-	0.000453 [0.860]	-
right_party_votes(t-2)	-	-	-	-	-0.00117 [-1.285]
Observations	178	171	171	171	171
Within R-squared	0.588	0.599	0.594	0.598	0.606
n clusters	7	7	7	7	7
country fixed effects	yes	yes	Yes	yes	yes
year fixed effects	yes	yes	Yes	yes	yes

Notes: standard errors are clustered at country level, and the corresponding t-statistics are reported in brackets below each coefficient. Results do not change if we control for the KOF index of globalisation or the share of FDI instead of trade openness.

*** significant at 1%, ** significant at 5%, * significant at 10%

Table 5: The determinants of wealth transfer taxes (relative to total revenue), G7 Countries, 1965 - 2009

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	wealth_tax/tax_rev	wealth_tax/tax_rev	wealth_tax/tax_rev	wealth_tax/tax_rev	wealth_tax/tax_rev	wealth_tax/tax_rev	wealth_tax/tax_rev
household_wealth(t-2)	0.686*** [8.383]	0.674*** [8.396]	0.661*** [6.106]	0.666*** [6.008]	0.653*** [5.883]	0.653*** [6.080]	0.643*** [5.805]
population_over65(t-2)	-0.105*** [-4.017]	-0.104*** [-4.174]	-0.104*** [-4.353]	-0.108*** [-4.357]	-0.0970*** [-3.875]	-0.101*** [-4.999]	-0.0926*** [-3.757]
solidarity_index(t-2)	10.39*** [4.844]	10.13*** [4.221]	8.771 [1.804]	6.273 [1.640]	8.810* [2.186]	8.648 [1.762]	8.649* [2.148]
real_gdp(t-2)	-4.753 [-1.251]	-4.717 [-1.255]	-4.201 [-1.011]	-1.924 [-0.468]	-4.436 [-1.100]	-3.927 [-0.955]	-4.080 [-1.037]
log_population_density(t-2)	-1.074 [-1.207]	-0.969 [-0.948]	-1.288 [-0.828]	-1.962 [-1.472]	0.197 [0.107]	-1.274 [-0.845]	0.254 [0.138]
public_expenditure/GDP(t-2)	-2.205 [-1.367]	-2.169 [-1.312]	-2.224 [-1.331]	-1.355 [-0.928]	-1.334 [-0.947]	-2.166 [-1.311]	-1.234 [-0.891]
natural_resources(t-2)	-	0.00678 [0.471]	0.00887 [0.465]	0.0218 [1.282]	0.00783 [0.447]	0.00825 [0.443]	0.00698 [0.414]
union_density(t-2)	-	-	0.00779 [0.315]	0.0149 [0.736]	0.00222 [0.0949]	0.00778 [0.314]	0.00206 [0.0882]
openness(t-2)	-	-	-	0.00859 [1.674]	-	-	-
KOF_index(t-2)	-	-	-	-	0.0167* [2.096]	-	0.0171* [2.100]
FDI(t-2)	-	-	-	-	-	0.00629 [0.449]	0.00832 [0.723]
Observations	200	200	200	200	200	200	200
Within R-squared	0.649	0.649	0.651	0.668	0.673	0.653	0.675
n clusters	7	7	7	7	7	7	7
country fixed effects	yes	yes	yes	yes	yes	yes	yes
year fixed effects	yes	yes	yes	yes	yes	yes	yes

Notes: standard errors are clustered at country level, and the corresponding t-statistics are reported in brackets below each coefficient.

Results do not change if we also control for labor force in agriculture and the ideological position of the political parties.

*** significant at 1%, ** significant at 5%, * significant at 10%

Table 6: The determinants of wealth transfer taxes (over GDP), 5 year averages, 1965 - 2009

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	wealth_tax/GDP	wealth_tax/GDP	wealth_tax/GDP	wealth_tax/GDP	wealth_tax/GDP	wealth_tax/GDP	wealth_tax/GDP
household_wealth	0.302*** [7.654]	0.273*** [9.414]	0.264*** [6.211]	0.253*** [5.638]	0.256*** [7.699]	0.251*** [6.743]	0.239*** [7.808]
population_over65	-0.0432** [-3.349]	-0.0398*** [-3.834]	-0.0403*** [-4.215]	-0.0403*** [-4.293]	-0.0360*** [-5.473]	-0.0360*** [-7.013]	-0.0307*** [-5.253]
solidarity_index	-0.786 [-1.681]	-1.212 [-1.355]	-1.581 [-1.116]	-2.596* [-2.119]	-1.545 [-1.352]	-1.647 [-1.172]	-1.619 [-1.484]
real_gdp	-2.598 [-1.549]	-2.524 [-1.698]	-2.140 [-1.277]	-0.845 [-0.554]	-2.221 [-1.457]	-1.584 [-1.072]	-1.578 [-1.217]
log_population_density	-0.603 [-1.861]	-0.413 [-0.909]	-0.601 [-1.026]	-0.838 [-1.739]	-0.0269 [-0.0378]	-0.617 [-1.154]	-0.00558 [-0.00794]
public_expenditure/GDP	-0.400 [-0.836]	-0.262 [-0.422]	-0.313 [-0.488]	0.0596 [0.101]	-0.00645 [-0.00950]	-0.274 [-0.462]	0.0595 [0.0947]
natural_resources	-	0.0169 [0.976]	0.0177 [0.918]	0.0346 [1.827]	0.0188 [1.056]	0.0164 [0.855]	0.0174 [1.009]
union_density	-	-	0.00395 [0.424]	0.00834 [1.359]	0.00102 [0.116]	0.00424 [0.451]	0.00116 [0.130]
openness	-	-	-	0.00456 [1.277]	-	-	-
KOF_index	-	-	-	-	0.00590 [1.596]	-	0.00631 [1.694]
FDI	-	-	-	-	-	0.00880 [0.779]	0.0103 [0.947]
Observations	48	48	48	48	48	48	48
Within R-squared	0.800	0.810	0.813	0.842	0.828	0.819	0.836
n clusters	7	7	7	7	7	7	7
country fixed effects	yes	yes	yes	yes	yes	yes	yes
year fixed effects	yes	yes	yes	yes	yes	yes	yes

Notes: variables are expressed as 5 years averages. Standard errors are clustered at country level, and the corresponding t-statistics are reported in brackets below each coefficient. Results do not change if we also control for the labor force in agriculture and the ideological position of the political parties.

*** significant at 1%, ** significant at 5%, * significant at 10%

Table 7: The determinants of top inheritance tax rates, 1960 - 2000

VARIABLES	(1) top tax rate	(2) top tax rate	(3) top tax rate	(4) top tax rate	(5) top tax rate	(6) top tax rate	(7) top tax rate
household_wealth(t-2)	7.766 [1.175]	5.752 [0.969]	5.368 [0.913]	6.025 [1.007]	4.751 [0.893]	4.976 [0.836]	4.311 [0.811]
population_over65(t-2)	-2.916 [-1.099]	-2.459 [-1.069]	-3.956 [-1.549]	-4.030 [-1.540]	-4.249 [-1.884]	-3.763 [-1.444]	-4.047 [-1.765]
solidarity_index(t-2)	0.379*** [8.467]	0.342*** [8.247]	0.153 [1.581]	0.147 [1.468]	0.156 [1.494]	0.133 [1.273]	0.134 [1.283]
real_gdp(t-2)	-0.00318** [-2.656]	-0.00299** [-2.710]	-0.00217* [-2.323]	-0.00194* [-1.947]	-0.00165 [-1.665]	-0.00206* [-2.177]	-0.00152 [-1.497]
log_population_density(t-2)	-40.94 [-1.030]	-15.64 [-0.441]	-71.84 [-1.219]	-84.60 [-1.214]	-117.0* [-2.269]	-75.70 [-1.251]	-122.3* [-2.107]
public_expenditure/GDP(t-2)	-5.622 [-0.396]	-4.414 [-0.430]	4.668 [0.281]	16.92 [1.488]	-27.13 [-1.768]	12.89 [0.914]	-18.96 [-1.461]
natural_resources(t-2)	-	0.853 [0.903]	1.150 [1.363]	1.132 [1.232]	1.444 [1.811]	1.079 [1.229]	1.374 [1.647]
union_density(t-2)	-	-	1.105 [1.893]	1.094 [1.831]	1.340* [2.311]	1.142 [1.865]	1.386* [2.290]
openness(t-2)	-	-	-	0.146 [1.237]	-	-	-
KOF_index(t-2)	-	-	-	-	-0.540 [-1.627]	-	-0.553 [-1.664]
FDI(t-2)	-	-	-	-	-	0.772 [1.068]	0.839 [0.953]
Observations	138	138	138	138	138	138	138
Within R-squared	0.580	0.590	0.640	0.645	0.663	0.646	0.670
n clusters	7	7	7	7	7	7	7
country fixed effects	yes	yes	yes	yes	yes	yes	yes
year fixed effects	yes	yes	yes	yes	yes	yes	yes

Notes: standard errors are clustered at country level, and the corresponding t-statistics are reported in brackets below each coefficient. Results do not change if we also control for the labor force in agriculture and the ideological position of the political parties.

*** significant at 1%, ** significant at 5%, * significant at 10%

Table 8: Simulations of the decline in reliance on wealth transfer taxation, G7 countries, 2017-2032

country	year	2009 actual wealth tax revenue /GDP	(1) Demographic effect			(2) Demographic and base effects		
			predicted wealth tax revenue/GDP	predicted wealth tax revenue/GDP (lower bound)	predicted wealth tax revenue/GDP (upper bound)	predicted wealth tax revenue/GDP	predicted wealth tax revenue/GDP (lower bound)	predicted wealth tax revenue/GDP (upper bound)
France	2009	0.3895						
France	2017		0.0850778	0	1.425247	0.0907608	0	1.432256
France	2022		0.0229016	0	1.37689	0.0336941	0	1.390179
France	2027		0	0	1.337203	0	0	1.357204
France	2032		0	0	1.297635	0	0	1.324812
Germany	2009	0.1898						
Germany	2017		0.0203793	0	1.985351	0.027063	0	1.993627
Germany	2022		0	0	1.942374	0	0	1.957056
Germany	2027		0	0	1.885227	0	0	1.906751
Germany	2032		0	0	1.799832	0	0	1.828649
Italy	2009	0.299						
Italy	2017		0.0074598	0	1.627733	0.0141181	0	1.635991
Italy	2022		0	0	1.59592	0	0	1.610573
Italy	2027		0	0	1.555529	0	0	1.577018
Italy	2032		0	0	1.492279	0	0	1.521058
Japan	2009	0.2834						
Japan	2017		0.1482794	0	2.605908	0.1929012	0	2.661729
Japan	2022		0.0714735	0	2.544984	0.1507176	0	2.644027
Japan	2027		0.0385567	0	2.518925	0.1549005	0	2.664313
Japan	2032		0.0019824	0	2.490006	0.1580807	0	2.685034
United Kingdom	2009	0.1716						
United Kingdom	2017		0.167051	0	2.104669	0.1727021	0	2.11168
United Kingdom	2022		0.141449	0	2.084435	0.152181	0	2.097742
United Kingdom	2027		0.1048747	0	2.055569	0.1210512	0	2.075615
United Kingdom	2032		0.0536708	0	2.015236	0.0756813	0	2.042485
United States	2009	0.2151						
United States	2017		0	0	2.549534	0	0	2.554103
United States	2022		0	0	2.478818	0	0	2.487487
United States	2027		0	0	2.395791	0	0	2.40884
United States	2032		0	0	2.325361	0	0	2.343097

Notes: Calculations based on specification (7) of Table 4a. Column 1: we use UN estimations for share of people aged 65 and above over total population for 2015, 2020, 2025 and 2030. For the other independent variables we use 2009 values. Column 2: we use UN estimations for share of people aged 65 and above over total population for 2015, 2020, 2025 and 2030. We predict household net wealth by regressing household net wealth at year t on household net wealth at year $t-1$. For the other independent variables we use 2009 values.