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Sustainability-oriented Future EU Funding: A European Net Wealth Tax

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Abstract

The increase of wealth inequality in many EU countries has spurred interest in wealth taxation. While taxes on wealth for a long time have played only a marginal role in the public finance and taxation literature, in the more recent literature a variety of arguments are brought forward in favour of (higher) wealth taxation. Most of these arguments directly or indirectly refer to the potential of wealth taxes to contribute to various dimensions of sustainability, in particular to economic, social, and/or institutional/cultural sustainability. Tax competition has led to an almost complete disappearance of recurrent taxes on personal or corporate net wealth in Europe. EU-wide implementation of a net wealth tax based on harmonised tax provisions may serve as a first step in a longer-term oriented move of the stepwise expansion of net wealth taxes on a global scale in the form of concentric circles. By dealing with non- and underreporting in the Household and Consumption Survey (HFCS) data set provided by the European Central Bank, we are able to estimate the wealth distribution within 20 EU Member States. Applying a progressive household-based tax schedule with a tax rate of 1% for net wealth above € 1 million and 1.5% for net wealth above € 5 million on these adjusted wealth distributions yields potential tax revenues of € 155 billion, taking into account the behavioural responses of individuals triggered by net wealth taxation. Given the positive sustainability properties of a net wealth tax with regard to economic efficiency and social inclusion, a European net wealth tax offers itself as an interesting candidate for sustainability-oriented tax-based own resources to finance the EU budget.

Keywords: Net wealth tax, EU taxes, tax-based own resources, EU system of own resources, sustainability-oriented taxation, HFCS

JEL classification code: H F55, H24, H87

1 Introduction¹

Although it has a longer tradition and history in tax practice compared to other taxes and notably the personal income tax, and although it is hotly debated in the political discourse, the taxation of wealth has traditionally attracted surprisingly little attention in the theoretical as well as empirical public finance and taxation literature (Cremer and Pestieau 2011). Only recently, against the background of increasing wealth inequality (Piketty and Zucman 2015), which is exceeding income inequality in most industrialised countries (Keeley 2015; Brys et al. 2016), wealth taxation has moved up the agenda; in the academic literature (see, e.g., Broadway, Chamberlain and Emmerson 2010; Cremer and Pestieau 2011; Kopczuk 2013; Piketty 2014) as well as in more policy-oriented contributions (see, e.g., Iara 2015): not least because, besides a number of other factors, tax policy is one determinant of growing wealth inequality, as the progressivity of tax systems has been eroded continuously over the last decades (Förster, Llena-Nozal and Nafilyan 2014). In particular, there is renewed interest in the taxation of net wealth, which currently is practiced in very few countries worldwide.

One argument often put forward against a tax on net wealth is that it cannot be enforced effectively on the national level due to legal and illegal forms of tax avoidance and tax competition based on the international mobility of assets (Broadway, Chamberlain and Emmerson 2010). However, as Cremer and Pestieau (2011) rightly point out, this (at least with regard to financial assets) valid argument should not lead to the conclusion that the tax should be eliminated, but rather calls for strengthening international cooperation and coordination. Unfortunately, in the literature proposals for an internationally coordinated approach to implement a net wealth tax are scarce. One rare exception is Piketty's (2014) proposal for a progressive global wealth tax, or at least a European wealth tax in a first step, with revenues going into national budgets: as "... a logical response..." (Piketty, Saez and Zucman 2013: 14) to counter the ongoing erosion of wealth taxation.

This paper sets out a slightly different proposal aiming at the creation of a framework supporting the effective taxation of net wealth in the EU: namely by introducing an EU-wide net wealth tax as one sustainability-oriented tax-based own resource to finance the EU budget. More precisely, the proceeds from a net wealth tax levied by EU Member States

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based on a harmonised design should be remitted to the EU to replace – within a fiscally neutral approach – a part of current EU own resources which are to be criticised, *inter alia*, for their lacking sustainability-orientation.² The current EU system of own resources hardly contributes to central EU policies (European Commission 2011; High Level Group on Own Resources 2016). In particular a link to the overarching goal of sustainable growth and development in its three dimensions, as anchored in the Europe 2020 strategy aiming at “smart, inclusive and sustainable growth” (European Commission 2010) or in the 2030 Agenda for Sustainable Development (European Commission 2016), is missing. Our proposal is intended to serve as an input for the debate about the next EU Multi-Annual Financial Framework 2021 to 2027 and the adoption of an EU overarching strategy to implement the 2030 Agenda for Sustainable Development.

The paper sketches design options for wealth taxation and reviews the most important pros and cons of wealth-related taxes in general and net wealth taxes in particular (chapter 2). We then provide an overview of the current situation with regard to wealth-based taxes in Europe in general and net wealth taxes in particular (chapter 3). Chapter 4 provides a sustainability-oriented rationale for assigning revenues from a net wealth tax to the EU budget. In chapter 5 the revenue potential of a European net wealth tax for 20 EU Member States countries (18 euro area countries plus Poland and Hungary) for which the required data are available from the European Central Bank’s Household and Consumption Survey for the year 2014 (HFCS 2016) is estimated. Based on Vermeulen (2014 and 2016), we account for the non- and under-/over-reporting in the HFCS data set at the right side of the distribution in order to obtain credible wealth distributions for the 20 EU Member States countries included. On these adjusted wealth distributions we apply a simple progressive net wealth tax schedule similar to the one suggested by Piketty (2014). Chapter 6 concludes.

² For a detailed criticism of the current EU system of own resources and a sustainability-oriented rationale for substituting current own resources by sustainability-oriented tax-based own resources see Schratzenstaller et al. (2016). The concept of sustainability and its dimensions is presented and discussed in the literature reviews by Nerudová et al. (2016) and Dimitrova et al. (2013). Fundamental deliberations on and key features of sustainability-oriented taxation are provided by Schratzenstaller (2016).

2 Taxing wealth: how and why?

2.1 Options to tax wealth

Wealth taxation can be based on various wealth-related tax bases or activities.

Graph 1

Graph 1 illustrates the various design options for wealth taxes and puts them in the more general context of options for the taxation of high incomes and wealth.

Wealth taxes in a narrow sense comprise taxes on the stock of wealth, on its transfer (via inheritances, gifts, or sales), or on increases in the value of stocks. They can tax different kinds of assets (financial assets, real estate, consumer durables, luxury items) and/or different tax subjects (private individuals/households or firms). One option within the taxation of the stock of wealth is a recurrent tax on net wealth, subjecting all kinds of assets to a uniform tax schedule. In tax practice, net wealth tax schedules (which may foresee a uniform tax rate or a progressive tax schedule) include a rather generous basic tax allowance exempting a certain amount of individual wealth completely from taxation regardless of its overall volume.³

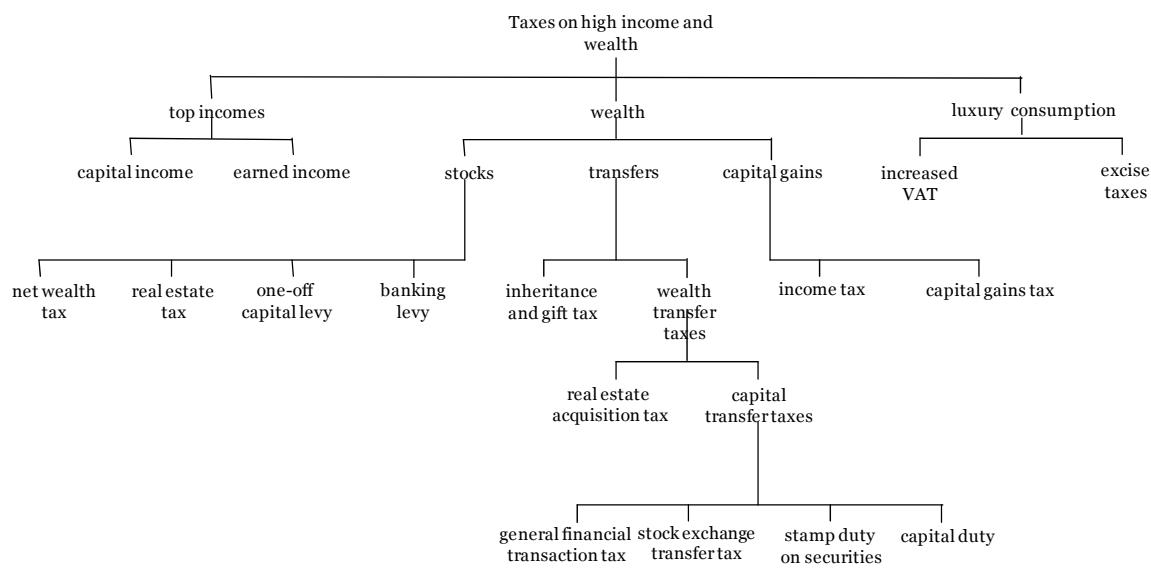
Without being able to go into the characteristics and effects of individual options for strengthening taxes on high incomes and wealth in general and on wealth in particular,

Graph 1 demonstrates the broad spectrum for possible designs of wealth-related taxes. Two remarks are in order here: First, the general pros and cons of wealth-related taxes apply to differing degrees to these individual tax options (see section 2.3 for a more detailed discussion). Secondly, their combination within overall tax systems is a non-trivial challenge for policy makers, as the complementarity of some of these options is quite obvious (e.g. the taxation of capital incomes and inheritances), while others are more substitutive (e.g. recurrent taxes on net wealth and capital incomes). The approach of an "ideal" combination of taxes on inheritances, net wealth and capital incomes proposed by Piketty, Saez and Zucman (2013) can be justified by the differing functions and effects of taxes on annual net worth, regular capital incomes, and wealth transfers. In this context, one of the most important arguments for levying a separate net wealth tax in addition to including capital incomes into personal income taxation is that many tax systems either fully exempt certain capital incomes (in particular imputed rents) or tax them at rather

³ See also the overview of existing and abolished net wealth taxes in Europe in chapter 3.

moderate flat rates (interest and dividend incomes). Depending on the extent to which capital incomes are taxed within personal income taxation, double taxation issues arise (see section 2.3.2 for a more detailed discussion).

Graph 1: Options for taxing high incomes and wealth



Source: Schratzenstaller, M. (2013). Besteuerung höherer Einkommen und Vermögen – Internationale Entwicklungstendenzen, Möglichkeiten und Grenzen. *Vierteljahreshefte zur Wirtschaftsforschung* 82(1): 13-34.

2.2 Rationale for taxing wealth

Taxes on wealth for a long time have played only a marginal role in the public finance and taxation literature. The standard result of optimal capital income taxation theory of a zero capital income tax rate (Atkinson and Stiglitz 1976; Judd 1985; Chamley 1986) was extended to a wealth tax, which is seen as equivalent to a tax on capital income. The rationale underlying the non-taxation of capital income are the highly distortive effects of a capital tax, which reduces the after-tax interest rate, on savings and capital accumulation (Eckerstorfer et al. 2013).

Only recently the Atkinson-Stiglitz and the Chamley-Judd result of zero optimal capital taxation has been challenged by several theoretical papers arguing for positive capital income taxes (see in particular Diamond and Saez 2011; Piketty and Saez 2012; Saez and Stantcheva 2016). Related is a growing body of recent literature bringing forward a variety of arguments in favour of (higher) wealth taxation in general and in Europe in particular. Most of these arguments directly or indirectly refer to the potential of wealth taxes to contribute to various dimensions of sustainability, in particular to economic, social, and

institutional/cultural sustainability. While the scope of the paper does not allow an in-depth discussion, it should be kept in mind that some of the general deliberations in this section apply to all options to tax wealth sketched in section 2.1, while others apply to differing degrees to the individual tax options.

2.2.1 The social dimension of wealth taxation

A first justification for the taxation of wealth is based on the ability-to-pay-principle, according to which wealth, besides income and consumption, is a central indicator for individual taxpayers' ability to pay (Messere, de Kam and Heady 2003). According to the IMF (2013), wealth is a better indicator for ability to pay than income. Piketty, Saez and Zucman (2013) point out that particularly for top wealth holders income flows often cannot be determined easily, which provides an important rationale for a progressive wealth tax. Wealth adds to the ability to pay by increasing prestige, individual security and options for economic and political influence (Iara 2015). Moreover, capital income is characterised by higher reliability and continuity vis-à-vis earned income. The increase of wealth and its inequality which can be observed in many OECD and EU countries (Piketty and Zucman 2015; Brys et al. 2016) reinforces this argument. Deepening wealth inequality strengthens the call for more redistribution by tax policy in general and by wealth taxes in particular: the more as the general progressivity of tax systems has declined since the beginning of the 1980ies in many OECD and EU countries and has thus weakened tax systems' contribution to social inclusion (Piketty, Saez and Zucman 2013; Förster, Llena-Nozal and Nafilyan 2014; Godar, Paetz and Truger 2016). Limiting wealth inequality is one important precondition to improve equality of opportunity and is therefore one recurring crucial argument for the taxation of wealth which was already brought forward, for example, in the Meade Report (Meade 1978). Equality of opportunity again strengthens not only social inclusion, but also economic efficiency (Keeley 2015). Not least, the contribution of the very wealthy to budget consolidation in the aftermath of the financial and economic crisis has been rather limited in EU countries. Considering that especially the owners of wealth benefited from government rescue measures, a particular contribution by this group via wealth taxes, to help consolidate public finances, appears justified against this backdrop (Iara 2015). Also negative social and political externalities of growing income and particularly wealth inequality and concentration are increasingly attracting the attention of economists (Stiglitz 2012; Atkinson 2015) and put forward as one motivation beyond the traditional distributional arguments for taxing wealth (see, e.g., Kopczuk 2010).

2.2.2 The economic dimension of wealth taxation

Another argument in favour of wealth-related taxes, their relative growth-friendliness, addresses the economic dimension of sustainability. Recent cross-country econometric

analyses (e.g. Arnold et al. 2011; Acosta, Ormaechea and Yoo 2012; Xing 2012) give strong support to the hypothesis that wealth-related taxes represent the comparatively least growth-damaging tax category. As their impact on individual decisions about labour supply and investment in (human) capital is rather limited, (certain) wealth-related taxes should have relatively small growth-inhibiting effects. According to the "tax and growth-hierarchy" corroborated empirically by these studies a revenue-neutral shift of the tax burden towards taxes on wealth, in particular away from taxes on earnings, would improve tax systems' overall growth-friendliness. Related is the argument that increasing wealth inequality can be expected to impact negatively on economic growth via various channels (Bagchi and Svejnar 2013; Ostry, Berg and Tsangarides 2014; Cingano 2014; Iara 2015; Stiglitz 2016), which strengthens the economic case for wealth taxation: one of these channels being the afore-mentioned contribution of wealth taxes to equality of opportunity.

Wealth-related taxes may also improve economic efficiency via various other channels (Iara 2015). Recurrent wealth taxes include incentives for employing assets productively, as the effective tax burden decreases with returns (OECD 1988; Norregaard 2013). Assuming that asset returns reflect the productivity of investments, recurrent taxes on wealth may support an efficient allocation of resources. Moreover, in the context of the financial and economic crisis certain wealth-related taxes have been discussed as corrective taxes. One example are taxes on the financial sector aiming at decreasing particularly risky and potentially destabilising transactions on financial markets (IMF, 2010): in particular a general financial transactions tax dampening short-term, highly speculative financial transactions (Schulmeister, Schratzenstaller and Picek 2008), and a banking levy counteracting excessive indebtedness of banks which may endanger financial market stability (de Mooij, Keen and Orihara 2013). The European Commission identifies a potential stabilisation function of a property tax in the case of real estate bubbles (European Commission 2012). Furthermore, potential negative effects of wealth inequality on macroeconomic stability have been pointed out recently (see, e.g., Godar, Paetz and Truger 2015; Iara 2015). Altogether, these potential benefits of wealth-related taxes may mitigate the efficiency-equity trade-off inherent in these taxes.

2.3 Problems of the taxation of net wealth

Considering the focus of this paper on an EU-wide tax on net wealth, this section critically reviews the most common objections and problems addressed in the public and academic debate with a specific focus on a net wealth tax. In principle the arguments considered are also relevant for other wealth-based taxes, but cannot be discussed specifically for these in detail here.

The phasing out of net wealth taxes in most European and OECD countries during the last quarter of the 20th century, as well as the refusal to introduce a net wealth tax in the first place by a number of other countries (see chapter 3 for details), was motivated by a variety of arguments: among them, as illustrated by a survey conducted by the OECD in the end of the 1970s among 21 OECD countries (OECD 1979), valuation difficulties and costs of tax collection, as well as double taxation issues and the impossibility to enforce net wealth taxes due to the mobility of the tax base. In the debate of the last few decades these counter-arguments have clearly dominated vis-à-vis the potential advantages of wealth taxes discussed in the previous section. In this section we will in more detail address the above-mentioned objections against recurring net wealth taxes which are still predominant also in the current debate.

2.3.1 Valuation difficulties and costs of tax collection

Evaluation difficulties are one of the most common arguments against a recurrent net wealth tax (see, e.g., Broadway, Chamberlain and Emmerson 2010). The necessity to regularly obtain and update market values for the taxable assets would incur costs that may be substantial in particular for less liquid assets. Due to evaluation difficulties, but also for other reasons administration costs for fiscal authorities and compliance costs for tax payers are expected to exceed average tax collection costs.

Most interestingly, there is only scant empirical evidence about tax collection costs in general and for net wealth taxes in particular: which does not only have to do with methodological and data problems, but also with the low prevalence of net wealth taxes and their sometimes rather short life span (as in the Irish example). According to a brief survey over three older studies for Germany prepared by the Scientific Advisory Council of the German Ministry of Finance, collection costs of the German net wealth tax, which was abolished in 1997, in relation to its revenues were substantially higher compared to other taxes (Wissenschaftlicher Beirat 2013). Sandford and Morrissey (1985) obtained similar results for the Irish net wealth tax levied from 1973 to 1975. A recent study for Germany estimates the collection costs for a net wealth tax at 8 percent of its revenues (Bach, Beznoska and Thiemann 2016). Piketty, Saez and Zucman (2013) point out that for top wealth holders, net wealth taxes in terms of collection costs may be less costly compared to income taxation if market values are available or can be determined more easily. Moreover, the issue of collection costs for a net wealth tax is put in perspective if one takes into account that market values are required also for an effective property tax and may reduce the evaluation costs for inheritance tax purposes. Not least, recent progress in information and communication technology should enable a significant reduction of tax collection costs.

It is often argued that the comparatively high collection costs of wealth-based taxes in general and of net wealth taxes in particular are particularly problematic in face of their relatively limited proceeds. Indeed, the data presented in section 3.1 show that wealth taxes in general and net wealth taxes in particular have never raised and are still not raising substantial revenues. However, this is rather the result of tax avoidance and of the general reluctance of governments to levy wealth-based taxes at all and to do so at substantial tax rates and without many exemptions. In principle, considering the large and increasing volumes of wealth (transfers) and their very unequal distribution, a net wealth tax as well as other wealth-based taxes can be expected to raise substantial revenues even if only the very wealthy are liable for taxation. At the same time, levying wealth taxes on the very wealthy few would keep collection costs moderate.

2.3.2 Issues of double taxation

A second point of criticism against a net wealth tax is related to issues of double taxation. In tax practice, net wealth taxes are not aiming at taxing the stock of wealth (and thus at reducing the after-tax stock of wealth against the pre-tax stock of wealth), but at taxing capital incomes derived from the taxed assets (and thus at reducing the rate of increase of the pre-tax stock of wealth). A net wealth tax of such a design will indeed result in double taxation if (and when) these capital incomes are subjected to regular capital income taxes within personal income taxation. The severity of double taxation issues depends on the rates of the net wealth tax on the one hand and of capital income taxes on the other hand.

As a general trend, the tax burden on capital incomes has been reduced all over the EU in the last few decades. In 7 out of 28 EU Member States this is the side-effect of replacing directly progressive personal income tax schedules by flat income taxes with relatively low uniform income tax rates since the mid-1990ies (Keen et al. 2006; Nicodème 2007; Evans and Aligica 2008). At the same time, all EU Member States with directly progressive income tax schedules have to some degree dualised their personal income tax systems (Schratzenstaller 2004). All or at least some kinds of capital incomes (interest and dividend incomes, capital gains) are taxed at source at rather moderate and proportional rates which are considerably lower than top income tax rates applied on labour and other (e.g. pension) incomes. This dualisation of income tax systems was implemented most comprehensively in the Nordic countries, almost all of which have introduced dual income tax systems privileging capital incomes at moderate flat rates and subjecting labour and other (mainly transfer) incomes to progressive tax schedules (Sorensen 1994). Most income tax systems do not tax imputed rents at all or only moderately, thus leaving substantial parts of real estate completely or almost tax exempt. Thus the “ideal” of comprehensively and progressively taxing all types of income regardless of their source on which particularly Western European personal income tax systems have traditionally been

based on has been substantially eroded during the last three decades, creating a taxation gap leaving room for a net wealth tax aiming at taxing capital incomes. Also for those capital incomes which have not been taxed properly due to exemptions or tax evasion, a net wealth tax will act as a complementary tax closing tax gaps (Piketty, Saez and Zucman 2013). Not least, double taxation can be mitigated by introducing a cap on the combined tax burden resulting from a net wealth tax and capital income taxes (as in the French example).

2.3.3 Tax avoidance and wealth migration

One strong objection against a net wealth tax articulated rather recently only is the fear that in open economies mobile capital cannot be taxed effectively, as tax subjects relocate their assets to avoid the tax (Messere, de Kam and Heady 2003; Owens 2006; Broadway, Chamberlain and Emmerson 2010). Increasing cross-border mobility of financial assets as well as the rise of tax havens, facilitated by the emergence of information and communication technology and the elimination of formal barriers to cross-border capital transfers (e.g. capital controls), have made the effective enforcement of net wealth taxes increasingly difficult. This is one of the main reasons why economists as well as international organisations (see, e.g., IMF 2011) in the majority advocate against the introduction of net wealth taxes or recommend replacing them by taxes on less mobile wealth, in particular by a property tax on real estate.

Generally, there is scant empirical evidence on the economic effects of net wealth taxes (Kopczuk 2013), neither on the extent and the consequences of international net wealth tax competition nor on elasticities of taxable wealth. This is surprising given the strong conviction voiced in many academic and policy-oriented contributions that due to strong avoidance reactions by tax subjects, net wealth taxes are not overly promising in terms of revenues to be expected. In the last years, only very few studies have undertaken to identify the impact of net wealth taxes on real economic activity (as for example wealth accumulation and entrepreneurship) on the one hand and on taxable, i.e. reported wealth on the other hand. It is still a matter of dispute in the literature whether a net wealth tax primarily affects real economic decisions or just exerts a dampening effect on reported wealth, which is strongly influenced by tax avoidance and/or evasion.⁴ Among this small number of recent studies is the analysis by Seim (2017), who estimates net-of-tax-rate elasticities of taxable wealth between 0.09 and 0.27 for Sweden. Further analysis suggests that about one third of the estimated elasticities is caused by underreporting of asset values and that tax-payers rather respond by tax evasion and avoidance than by changes in saving.

⁴ See Brülhart et al. (2017) for a review of the very few existing studies and their limitations.

Moreover, studies disentangling tax avoidance effects which influence reported wealth are missing. Existing empirical evidence on reported wealth does not allow to identify and to quantify, respectively, international capital flight as one distinct tax avoidance/evasion channel. There are no econometric analyses directly addressing the question whether net wealth taxes lead to outflows of mobile capital.

However, two kinds of evidence for some impact of wealth taxation on the relocation of assets exist. First, recent estimations suggest that considerable volumes of private wealth are hidden in tax havens; whereby one central motivation quite obviously is to escape taxation (see, e.g., Lane and Milesi-Ferretti 2010; Zucman 2014; Johannesen and Zucman 2014). Secondly, several case studies corroborate the theoretical expectation that wealth taxes cause (illicit) offshore transfers of assets. After the abandonment of all foreign exchange controls in Sweden in 1989, for example, an outflow of large fortunes to tax havens like Switzerland or Luxemburg was observed, which provided one strong motivation for the government to discontinue the net wealth tax in 2007 (Henrekson and Du Rietz 2014). Pichet (2007) finds a considerable volume of capital flight out of France since the introduction of the French net wealth tax.

A recent study by Brülhart et al. (2017) gives support to the plausible assumption that the effect of net wealth taxes on reported wealth is the more pronounced the more integrated the regions involved are. According to the authors' estimations, the semi-elasticity of reported wealth with respect to the net wealth tax rate amounts to 35% in aggregate, i.e. a rise in wealth taxation by one percentage point decreases reported wealth by 35%. Moreover, Brülhart et al. (2017) find that financial assets seem to be more responsive to taxation than non-financial assets. They also interpret their results as suggesting that wealth holders primarily respond by reducing their wealth holdings, not by moving to jurisdictions with lower tax rates.⁵

It must be noted, however, that these analyses do not uncover the channels via which wealth holdings are lowered. As indicated above, reported wealth holdings may be reduced by real responses (i.e. by lowering accumulation of wealth) or by decreasing reported wealth through hiding it from tax authorities. Which of these mechanisms is working in the Swiss case cannot be determined without further analysis, e.g. by exploring whether there is some relationship between the savings rate and the taxation of net wealth.

Thus, we interpret these empirical results as not contradicting our assumption that tax subjects' reactions make it increasingly difficult to enforce a tax on net wealth in a purely

⁵ To our knowledge the Brülhart et al. (2017) study is the only one investigating potential effects of net wealth taxes on locational choices of taxpayers. Their finding of low tax-induced mobility corresponds well to the results of the few existing empirical analyses determining the impact of estate or inheritance taxes on locational choices, which generally show very modest effects (see Brülhart and Parchet (2014) for Switzerland, and Smith Conway and Rork (2006) for the United States).

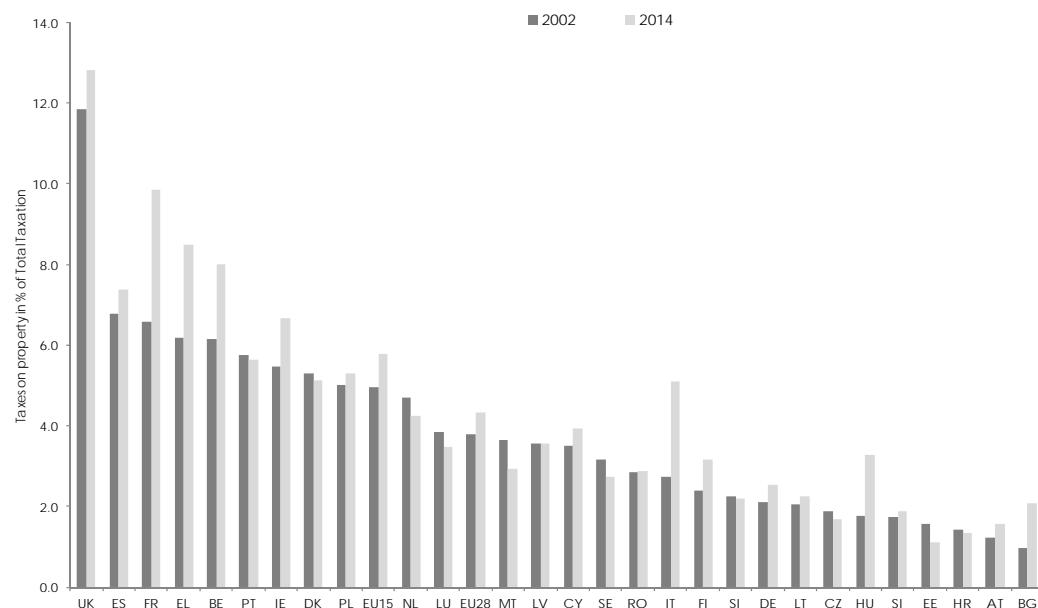
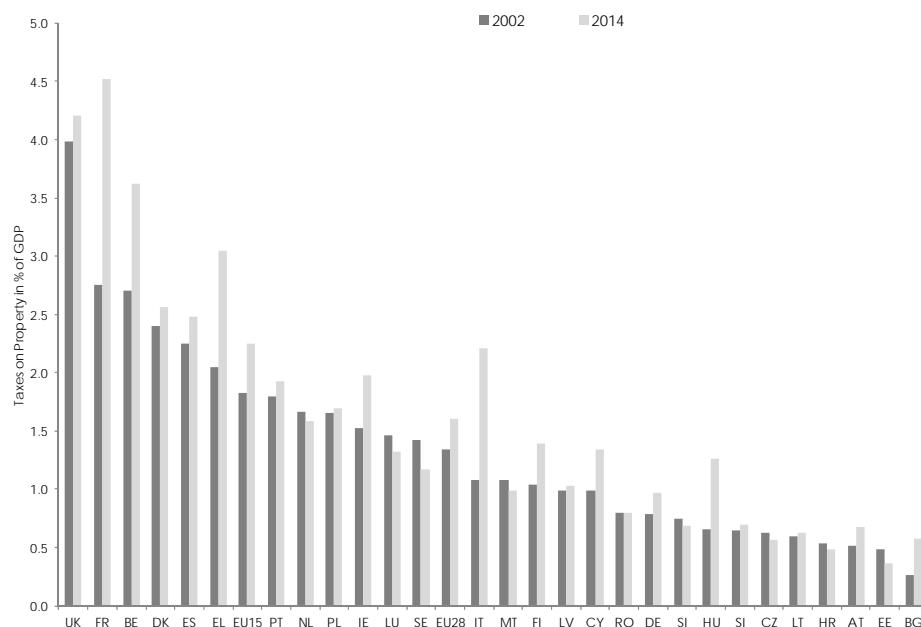
national context. These responses probably take the form of manipulations of reported wealth via various channels including hiding wealth abroad in low- or no-tax jurisdictions rather than moving tax payers' locations abroad. Although there is no systematic and elaborated empirical evidence on international net wealth tax competition, the development of wealth taxation in Europe during the last few decades lends some support to the hypothesis that a race-to-the-bottom-type of tax competition based on the international mobility particularly of financial assets has led to the almost complete disappearance of net wealth taxes and the observable shift within wealth taxation towards property taxes on immobile real property (see chapter 3). The tax rate elasticities of tax bases and low mobility of tax payers found in the existing empirical studies suggest that at least part of this specific downward tax competition in the realm of net wealth taxes may be – following Brülhart and Parchet (2014) – characterised as "alleged" tax competition. However, in combination with the still extensive options to make use of tax havens worldwide to hide wealth from domestic tax authorities (Zucman 2014) this tax competition – be it alleged or actually existing – calls for a supranationally coordinated approach.

3 Current situation of wealth taxation in the EU

3.1 Revenues from wealth-related taxes: size and structure

Wealth-related taxes play a minor role within overall tax systems in the EU, gauged by their shares in overall tax revenues as well as in GDP (see *Graph 2*).

Graph 2: Wealth-related taxes in the EU, 2002 and 2014



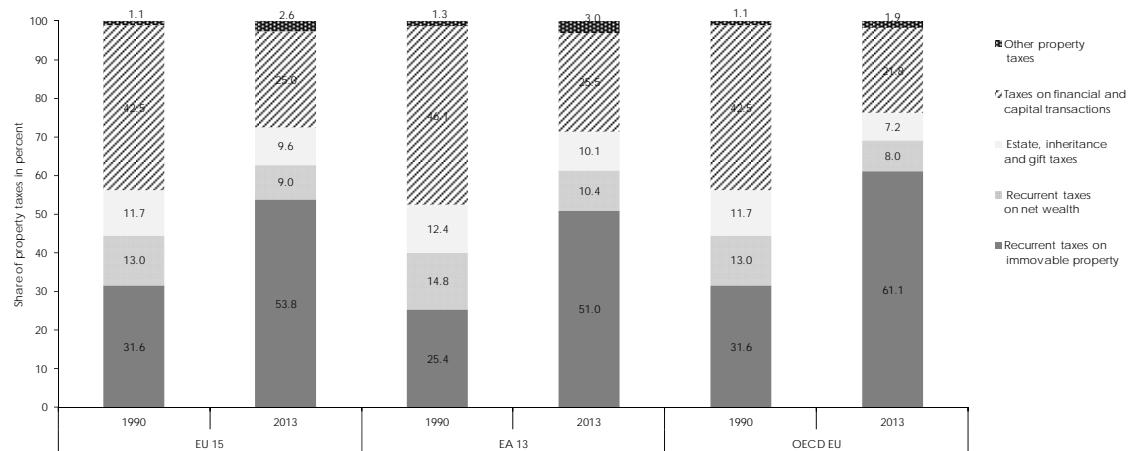
Source: European Commission. 2016a, Data on Taxation, Provisional update of data by economic function, http://ec.europa.eu/taxation_customs/business/economic-analysis-taxation/data-taxation_en (Accessed 2016-07-05).

In 2014, wealth-related taxes yield 4.3% of overall tax revenues and 1.6% of GDP on average for the EU28. In the euro area (EA19), wealth-related taxes make up for 4.2% of overall tax revenues and 1.6 of GDP, in the EU15 they amount to 5.8% of overall tax revenues and 2.2% of GDP. Although their weight has slightly increased compared to 2002, the contribution of wealth taxes to financing public budgets thus is rather modest. Their long-term quasi-stagnation despite considerably growing volumes of wealth (transfers) appears as the mirror image of the scant academic interest in the subject.

The use of the various options for wealth-related taxes differs considerably in the EU (Ernst & Young 2014). The property tax on real estate is known in 25 EU Member States. An inheritance and gift tax exists in 20, and a real estate acquisition tax in 21 Member States. A net wealth tax has become an exception in the EU, notably along with the erosion of capital income taxation discussed in section 2.3.2. Accordingly, the structure of overall revenues from wealth-related taxes has shifted considerably in the longer run (Graph 3).

Between 1990 and 2013 the share of net wealth taxes in overall revenues from wealth-related taxation declined from 13% to 9% in the EU15, from almost 15% to 10.4% in the EA13, and from 13% to 8% in those EU countries for which OECD data are available. In all country groups regarded, also taxes on financial and capital transactions as well as estate, inheritance and gift taxes have been losing in importance since 1990. In contrast, recurrent taxes on immovable property (in particular real estate taxes) have been extending their share markedly since 1990, to over 50% of wealth-related tax revenues in the EU15 and the EU13 and to over 60% in the EU-OECD-countries.

Graph 3: Structure of revenues from wealth-related taxes, 1990 and 2013



Source: *OECD (Revenue Statistics 1965-2014, Paris, 2015. Arithmetic averages. Austria: excluding one-off revenues from tax agreement with Switzerland.*

3.2 Net wealth taxes in Europe: historical development and status quo

Table 2 gives an overview of the current situation concerning net wealth taxes in Europe. It focuses on recurrent net wealth taxes levied on all kinds of assets, which excludes specific wealth taxes on specific assets, like motor vehicles (as, e.g., in Bulgaria or Denmark) or water vessels (as, e.g., in Slovenia).⁶ With the exception of Norway and Switzerland, existing net wealth taxes are exclusively levied by the federal or national government.

In the beginning of the 20th century several of the now EU Member States and other European countries introduced a net wealth tax or transformed a formerly existing one into a net wealth tax with modern design. Almost all these countries (with the exception of Switzerland, Norway and Luxembourg for corporations) have abolished their net wealth taxes starting in the beginning of the 1990s; often after several reforms cutting tax rates or increasing tax-exempted amounts. Among the last EU Member States to discontinue their net wealth taxes were Finland and Sweden in 2006 and 2007, respectively: both countries had held on to their net wealth taxes for a long time as a compensation for the regressive dual income tax introduced in the beginning of the 1990s (Messere, De Kam and Heady 2003).

Only very few countries adopted net wealth taxes as late as in the last quarter of the past century. Of these countries, Ireland and Italy discontinued their net wealth taxes after a

⁶ For an overview over specific wealth taxes in the EU, see Ernst & Young (2014).

few years, while they still exist in France and (after being re-introduced temporarily in 2011) in Spain only.

The few net wealth taxes still in existence apply either a progressive tax schedule or a single flat rate, mostly at the federal or national level. Norway and Switzerland are exceptions insofar as their net wealth taxes are not a (pure) federal tax, but are levied both at the municipal and national level (Norway) or by cantons (Switzerland), respectively. Norway, Spain and France tax private individuals/households only, while Luxembourg exclusively taxes corporations and Switzerland taxes both private individuals/households and (at a considerably lower rate) corporations.

Two European countries introduced a net wealth tax temporarily as one fiscal consolidation measure after experiencing severe budgetary problems as a consequence of the financial and economic crisis; both after having discontinued it shortly before. Spain, which had abolished its net wealth tax in 2007, re-introduced it temporarily in 2011; in the meantime the application of the tax was prolonged several times, most recently until 2017. Iceland, which had eliminated its net wealth tax in 2006, re-introduced an "emergency wealth tax" in 2010 temporarily until 2014.

Overall, in Europe countries that have never levied a net wealth tax constitute a majority vis-à-vis those countries that have taxed net wealth in the past or still do so. In particular, not a single one of the "new" EU Member States which have acceded to the EU from 2004 on has ever levied a net wealth tax. Also in the OECD net wealth taxes have never been applied widely: the European OECD countries outside the OECD included in Table 2 are the only OECD countries having had or still having a net wealth tax. Neither the United States nor Japan have ever levied such a tax or consider introducing one.⁷ To our knowledge, outside the OECD world net wealth taxes are not common either: India discontinued the tax (which it had adopted in 1957) in 2015; Brazil has been discussing its introduction for the last 30 years without result; and China has never had one.

In terms of GDP, existing net wealth taxes yield rather modest revenues: between 0.11% in Spain and 1.5% in Luxembourg. Also historically, as *Table* shows, net wealth taxes have never contributed much to overall tax revenues.

⁷ The new US President Donald Trump had pledged for the introduction of a one-off levy of 14.25% on net wealth for the super-rich to pay back debt in 2000 (Trump and Shiflet 2000). Trump's – still vague – tax plans as of the beginning of 2017 obviously do not foresee any tax on net wealth.

Table 2: Net wealth taxes in Europe

Country	Tax subject ^{⑥)}	Tax rates and exemptions	Tax revenues in % of GDP ^{①)}	Introduced in	Selected modifications ^{②)}
Abolished net wealth taxes					
Ireland	Personal	1% Tax-exempted amount: £ 70,000 for singles; £ 100,000 for couples; £ 2,500 per child (€ 107,100/€ 153,000/€ 3,800)	0.09	1975	Abolished in 1978
Austria	Personal <i>Corporations</i>	1% tax-exempted amount: ATS 150,000 per family member; additionally ATS 150,000 for individuals over age 60 (amounts in Euro: € 10,900/€ 10,900) 1% <i>tax exemption limit^{④)}: ATS 150,000 (€ 10,900)</i>	0.14 0.33	1923	Major revisions in 1934, 1939, 1955 Increased in 1977 Abolished in 1994
Italy	<i>Corporations</i>	0.75%	0.29	1992	<i>Introduced temporarily</i> <i>Abolished in 1995</i>
Denmark	Personal	2.2% tax-exempted amount: DKK 630,000 (€ 85,600) for adults or couples; DKK 630,000 (€ 85,600) per child	0.06	1903	Abolished in 1997
Germany	Personal <i>Corporations</i>	1% tax-exempted amount: DM 120,000 (€ 61,354) per family member 0.6% <i>tax exemption limit^{④)}: DM 20,000 (€ 10,226)</i>	0.11 0.13	1893 (Prussia)	Major revisions in 1923, 1974 Decreased in 1978 Abolished in 1997
The Netherlands	Personal	0.7% Tax-exempted amount: € 90,756 for individuals	0.18	1892	Major revisions in 1964, 1980 Abolished in 2001 and replaced by 30% income tax on a fictitious return of 4% on financial assets (corresponds to a net wealth tax of 1.2%)
Finland	Personal	0.8% tax-exempted amount: € 250,000 for individuals	0.08	1920	Major revisions in 1967, 1975, 1976, 1977 Increased in 1978 Decreased in 2005 Abolished in 2006
Luxembourg	Personal	0.5% tax-exempted amount: € 2,500 for adults; € 2,500 per child	0.55	1913	Major revisions in 1919, 1941 Abolished in 2006 for individuals/households
Sweden	Personal <i>Corporations</i>	1.5% Tax-exempted amount: SKR 1.5 million (€ 160,351) for singles, SKR 3 million (€ 10,474) for couples 0.15% <i>Tax-exempted amount: SKR 15,000 (€ 1,604)</i>	0.19 0.01	1911	Major revision in 1934 Increased in 1938 Increased in 1947, 1972, 1984 Decreased in 1986, 1992 Decreased and replacement of progressive tax schedule by uniform tax rate in 1993 Abolished and re-introduced in 1994 Decreased in 2002, 2003, 2006 Abolished in 2007

Iceland	Personal <i>Corporations</i>	1.5% - 2% (above ISK 150 million (€ 1 million) for singles, above ISK 200 million (€ 1.3 millions) for jointly taxed individuals) tax-exempted amount: ISK 75 million (€ 0.5 million) for singles, ISK 100 million (€ 0.65 millions) for jointly taxed individuals 0.6%	0.48	1096/97	Major revisions in 1556, 1874, 1877, 1909, 1921 Decreased in 2003 Abolished in 2006 Re-introduced temporarily as "emergency wealth tax" in 2010 Increased in 2011 Increased in 2012 and replacement of uniform tax rate by progressive tax schedule Abolished in 2015 Abolished in 2006
Existing net wealth taxes					
Switzerland (Zurich) ³⁾	Personal <i>Corporations</i>	0.110%-0.657% tax-exempted amount: CHF 77,000 (€ 73,389) 0.16425%	0.89 0.24	1840 (Canton of Basle City) 1913	Gradual introduction by all cantons between 1840 (Canton of Basle City) and 1970 (Canton of Glarus) Major revisions in 1919 and 1941 Abolished in 2006 for individuals/households
Luxembourg	<i>Corporations</i>	0.5%	1.5	1913	Major revisions in 1919 and 1941 Abolished in 2006 for individuals/households
Norway	Personal	0.7% municipal level tax-exempted amount: NOK 1 million (€ 106,200) for individuals 0.15 national level tax-exempted amount: NOK 1.2 million (€ 127,500) for individuals	0.3	1918	Increased in 2002 and replacement of uniform tax rate by progressive tax schedule at national level Decreased in 2007, 2008 Increased in 2009 and replacement of progressive tax schedule by uniform tax rate at national level Decreased in 2010, 2012, 2014
Spain	Personal	0.2% - 2.5% (above € 10.696 million) tax-exempted amount: € 700,000 for individuals	0.11	1977	Abolished in 2007 Re-introduced temporarily in 2011, since then prolonged several times
France	Personal	0.5% - 1.5% (above € 10 million) tax-exempted amount: € 800,000 for individuals	0.24	1982	Abolished in 1986 Re-introduced in 1989 Decreased in 2012 Increased in 2013

Sources: OECD (1979 and 1988); Messere, De Kam and Heady (2003); Bundesministerium der Finanzen (2016); Ernst & Young (2014); own research and compilation. – 1) For abolished taxes: last year of existence; for existing taxes: 2014. – 2) Due to lack of comprehensive information, the modifications recorded here may be incomplete for some countries. Modifications may be in the form of variations of the tax rate or of the size of tax exemptions – 3) Levied by cantons at differing rates. – 4) Above this threshold, the whole taxable net wealth was liable for taxation. – 5) Initially limited to two years; most recent extension until 2016. – 6) Personal: at individual or household level. – 7) 2015.

4 A net wealth tax as sustainability-oriented tax-based revenue source for the EU budget

In the last years efforts have been intensified, in particular in the OECD and the EU, to strengthen international cooperation and information exchange. However, a European net wealth tax based on a uniform design may be an important complement to these cooperative solutions, removing downward pressure on tax rates at least within the EU. Given the positive sustainability properties of a wealth tax with regard to economic efficiency and social inclusion (see chapter 2), a European wealth tax offers itself as an interesting candidate for sustainability-oriented tax-based own resources to finance the EU budget. Such a sustainability-oriented approach to reform the current EU system of own resources, as suggested by Schratzenstaller et al. (2017), was taken up recently by the inter-institutional High Level Group on Own Resources chaired by Mario Monti in its final report on the future design of the EU's financing system commissioned by the European Commission, the European Parliament, and the European Council (High Level Group on Own Resources 2016).

Assigning revenues from a net wealth tax to the EU budget may be motivated by two reasons in particular: First, at least part of these revenues are "additional" in the sense that they would not have been realised within an uncoordinated setting in which EU Member States unilaterally try to implement net wealth taxes. Secondly, the wealthy should have benefited over-proportionally from the economic benefits provided by the creation of the EU, its single market in general and the free movement of capital in particular. Therefore not only based on the ability-to-pay-principle, but also considering the benefit-principle an over-proportionate contribution by the wealthy to financing the EU budget appears justified (Grüner 2013, Schratzenstaller et al. 2016). Implementing an EU-wide net wealth tax in a fiscally neutral way may strengthen political and social acceptance of tax regimes in the EU: Member States could reduce their national contributions to the EU budget, which would enable them to reduce less sustainability-oriented taxes, in particular the high labour taxes for lower incomes. Moreover, reversing the trend of eroding taxes for the very wealthy may strengthen the perceived fairness of taxation and thus general tax morale. Thus an EU budget partially financed from an EU-wide net wealth tax could serve as an illustrative example for the potential benefits of stronger cooperation within the EU and would thus bear potential to support EU integration.

5 Potential revenues of an EU-wide net wealth tax

In the last few years, empirical research in the field of wealth distribution and wealth taxation has finally gained some momentum. For our estimation of the revenue potential of an EU-wide net wealth tax we have at our disposal not only up-to-the-minute data but also the necessary methodology in order to deal with it adequately. The basis for our estimation is the Household, Finance and Consumption survey (HFCS) conducted by the European Central bank. At the end of 2016, the second wave of the HFCS was released, providing information about the composition and distribution of wealth in 20 EU Member States (18 euro area countries plus Hungary and Poland) for the year 2014. As the UK, which is not included in the HFCS, is about to leave the EU, the total tax revenue estimated for these 20 EU countries can be seen as a very close approximation to the revenue of an actual EU-wide-net wealth tax.

In the aftermath of the financial crisis the HFCS was actually designed and conducted to explore the wealth situation of private households within the euro area in order to evaluate the potential risk of macroeconomic shocks on private households. The shortcomings of this survey, especially with regard to questions of inequality, are differential non-reporting, i.e. that non-reporting is positively correlated with wealth, and underreporting of wealth due to small sample size.

Using the strong empirical evidence that wealth on the right end of the wealth distribution indeed follows a Pareto distribution, Vermeulen (2014 and 2016) suggests to deal with underreporting by including observations from rich lists into the sample in a first step, and then in a second step to estimate the alpha coefficients of the respective Pareto distributions.⁸

The second issue is the under-reporting of certain assets in surveys like the HFCS, meaning that total wealth for a given country is considerably lower according to the survey as compared to national (financial) balance sheets. For example, compared to national balance sheets up to 88% of financial wealth is missing in the HFCS. Vermeulen (2016) suggests the introduction of weights for the relevant types of assets so that the totals of the survey match the totals of the national balance sheets.

⁸ The HFCS is an multiple imputed data set, meaning that missing entries for certain variables are determined via complex bayesian estimation. This is done in order to also harvest the information of incomplete observations. For each observation there are five implicants. For variance estimation, the survey provides bootstrap replicate weights. Vermeulen's approach in dealing with differential non-response has the positive side effect that the in-between-imputation variance of estimated alpha parameters is strongly reduced. This is due to the fact that including the very rich who, with regard to net wealth, can be regarded as complete observations, i.e. having the same value in all imputations, "anchors" the Pareto distribution at its very top end.

5.1 Methodology

Only the most basic steps shall be outlined here, as the methodology is described in detail in Vermeulen (2014) and Bach et al. (2015).⁹

The tail density function of the Pareto distribution is given by

$$f(w_i) = \begin{cases} \frac{\alpha w_{\min}^\alpha}{w_i^{\alpha+1}} & \text{if } w_i \geq w_{\min} \\ 0 & \text{if } w_i < w_{\min} \end{cases} \quad (1)$$

where w_i is the net wealth of household i , w_{\min} is the lower bound of the Pareto distribution, and α is the shape parameter which is to be estimated. The lower α , the fatter is the tail of the distribution and the more unequal wealth is distributed among households.

The complementary cumulative distribution function (ccdf) is obtained the following way:

$$P(W \leq w_i) = F(w_i) = \int_{w_{\min}}^w f(t) dt = 1 - \left(\frac{w_{\min}}{w_i}\right)^\alpha ; \forall w_i \geq w_{\min} \quad (2)$$

$$P(W > w_i) = 1 - P(W \leq w_i) = \left(\frac{w_{\min}}{w_i}\right)^\alpha ; \forall w_i \geq w_{\min} \quad (3)$$

If, in a finite Population of N households, everyone has wealth at or above w_{\min} we can denote by $N(w_i)$ the number of households that have wealth at or above w_i . Wealth in this population is said to follow a power law if it is distributed according to the following relationship:

$$\frac{N(w_i)}{N} \cong \left(\frac{w_{\min}}{w_i}\right)^\alpha ; \forall w_i \quad (4)$$

This implies that the fraction of households with wealth at or above w_i follows the regularity of a power function. If a random sample of the population is drawn we can denote by $n(w_i)$ the number of sample observations that have wealth at or above w_i , which is also called the rank of the observation. The wealthiest household in the sample has rank one, the second wealthiest has rank two, etc. The relative frequency in the sample is an estimate of the relative frequency in the population:

⁹ For an in-depth analysis and critical review of the methodology see Dalitz (2016).

$$\frac{n(w_i)}{n} \cong \frac{N(w_i)}{N}; \forall w_i \quad (5)$$

Now we can combine the relative frequency of the sample with the ccdf:

$$\frac{n(w_i)}{n} \cong \left(\frac{w_{\min}}{w_i}\right)^{\alpha}; \forall w_i \quad (6)$$

In order to estimate α with OLS, the logarithm of (6) is taken:

$$\ln \frac{n(w_i)}{n} = -\alpha \ln \frac{w_i}{w_{\min}} \quad (7)$$

Vermeulen (2014) emphasizes the importance of taking into account the complex survey design of the HFCS. In the HFCS the survey weight for each observation stands for the number of households that this sample point represents. In a first step the households have to be ranked again: the wealthiest household with w_1 has a survey weight of N_1 etc. The relative frequency of the wealthiest household is $\frac{N_1}{N}$, the relative frequency of the second household is $\frac{N_1+N_2}{N}$ etc. Now the rank of $n(w_i)$ can be replaced by the sum of all survey weights of sample observations at or above a wealth level of w_i . Finally the sample size n can be replaced by the population size N , whereas N is the sum of all survey weights of the sample points with wealth at or above w_{\min} (Vermeulen 2014).

It should be noted, however, that usually shape parameters of power laws are estimated via maximum likelihood estimation. Vermeulen (2014) provides a pseudo maximum likelihood estimator, which also accounts for the complex survey design of the HFCS. However, after conducting a Monte Carlo simulation in which both estimators were tested he decided to go along with OLS instead of MLE.

The more important remaining question, however, is how to determine w_{\min} Vermeulen (2014) circumvents the problem by providing 3 different scenarios, estimating α for lower bounds of € 500.000, € 1 million, and € 2 million. Bach et al. (2015) employ a graphical approach in determining the “correct lower bound”, which they find for Germany, France, Spain and Greece to be at € 500.000. Both approaches are criticized in Eckerstorfer et al. (2016) who estimate the Pareto parameters for Austria based on the HFCS data of the first wave. The authors rightly point out that the “correct” lower bound is crucial: a lower bound that is in fact too low would bias the results, whereas a lower bound which is too high would ignore useful information. Following Clauset et al. (2009) Eckerstorfer et al. (2016) compare the goodness of fit of 30 combinations of lower bound and shape parameter and choose subsequently the best fitting combination. They apply the Cramer-van Mises

criterion to test the goodness of fit. As concluded in Dalitz (2016) the Cramer-van Mises criterion and the Kolmogorov-Smirnov criterion (KS) have typically the same qualitative dependency on w_{\min} . This means that both criteria yield very similar optimal choices for w_{\min} . For our purposes we indeed use the KS in order to test the goodness of fit of the 3 scenarios provided by Vermeulen (2014). Normally, the goodness of fit is measured by the distance between the empirical cumulative distribution function $F_{\text{emp}}(w)$ and the fitted cumulative distribution function $F_{\text{fit}}(w)$. Clauset et al. (2009) prefer the KS which is the maximum distance between the two distributions ($N(w_i)$ and $N(w_{\min})$, here being the sum over all weights at or above either w_i or w_{\min}):

$$\text{KS} = \max_{w \geq w_{\min}} |F_{\text{fit}}(w) - F_{\text{emp}}(w)| = \max_{w_i \geq w_{\min}} \left| \left(\frac{w_i}{w_{\min}}\right)^{-\alpha} - \frac{N(w_i)}{N(w_{\min})} \right| \quad (8)$$

We can confirm the results of Bach et al. (2015) that the lower bounds of € 1 million and € 2 million are indeed too high. The goodness of fit for combinations of the shape parameter with a lower bound of € 500,000 is better than combinations with € 1 million and € 2 million for all countries in the sample.

Unfortunately, however, this procedure cannot be easily applied once the data in the HFCS have been adjusted so that the totals match the ones in the national balance sheets.

5.2 Adjustment to national balance sheets

As mentioned above, the totals of financial assets and liabilities in the HFCS are not even close to the ones outlined in the national balance sheets. On average 74% of financial assets and 40% of liabilities are missing in the HFCS compared to the national balance sheets. This is why Vermeulen (2016) proposes to reweigh the data in the HFCS so that they match the national accounts. We follow the author in this approach as neglecting 74% of European financial assets would result in a dramatic under-estimation of the potential revenues of a net wealth tax. Basically, Vermeulen (2016) adjusts the HFCS data so that the totals of real assets, financial assets and liabilities from the Pareto tail combined with the ones below the Pareto tail match their counterparts in the national balance sheets.

We make only one exception to this approach: we do not adjust the real assets for several reasons. First, the differences between real assets in the national balance sheets and the ones in the HFCS are far less drastic compared to financial assets and liabilities. Secondly, the categories used to determine total real assets in the national balance sheets are often very different to the ones used in the HFCS. The most obvious example is that valuables such as jewellery and art are not at all accounted for in the national balance sheets.

Thirdly, for some countries households' real assets are simply not existent in national balance sheets. Fourthly, and most importantly, however, it is questionable whether the estimates of statistical offices regarding house prices etc. are superior in comparison to the self-evaluation of households. This is why we leave the real assets unadjusted. Note, however, that through correcting for the non-reporting by estimating the Pareto tail of the wealth distribution, the totals of real assets are increased nevertheless.

5.3 Procedure

First, we add 265 observations of the Forbes rich list (Europe 2016) to the HFCS. Unfortunately, there were no entries on the list for 7 of the 20 countries considered in the HFCS. With this enlarged data set we estimate the shape parameter α for the three lower bounds suggested by Vermeulen (2014). Then we test the goodness of fit of these three combinations of parameters for all 20 countries and find strong incidence that the lower bounds of € 1 million and € 2 million are indeed too high. We test before the adjustment to the national balance sheets because for every combination of shape parameters and lower bound, the data in the HFCS has to be adjusted differently so that the totals in the tail plus the totals below the tail actually match their counterparts in the national balance sheets. So the empirical distribution will be slightly different for every combination of parameters. This is why testing for the goodness of fit after every adjustment in order to compare different combinations of parameters is no longer an option. However, in line with one of Vermeulen's scenarios, the results of Bach et al. (2015), and based on our pre-adjustment testing we are confident using € 500,000 as the lower bound w_{\min} .

In a second step, observations from the Forbes rich list are dropped, financial assets and liabilities are adjusted and the ratios of financial assets to net wealth and liabilities to net wealth above the threshold of € 500,000 in the HFCS data are obtained. These ratios we take as an approximation to the ratios in the Pareto tail in order to being able to divide the Pareto tail into its components.

Thirdly, observations from the rich list are added again, and the shape parameter α is estimated. The Pareto tail is split into its components according to the ratios obtained in the second step. This is done in an iterative procedure up to the point where the sum of financial assets and liabilities from within the tail and below the tail in fact match the totals in the national balance sheets.

The variance of our coefficients is estimated according to the HFCS methodological report of the second wave (European Central Bank 2016):

Each observation in the HFCS has a final estimation weight r_i . There are M implicants (multiple imputation) indexed by m , and B replicate weights r_{ib} indexed by b . In the HFCS, $M = 5$ and $B = 1000$. For each implicate m , the estimator of interest α_m is calculated using the estimation weight r_i . The variance of this estimator is estimated using the bootstrap replicate weights as follows: for each of the B replicates, using the replicate weight r_{ib} , calculate α_{mb}^* , with mean across replicates $\bar{\alpha}_m^* = \frac{1}{B} \sum_{b=1}^B \alpha_{mb}^*$. The partial variance for implicate m is $U_m = \frac{1}{B-1} \sum_{b=1}^B (\alpha_{mb}^* - \bar{\alpha}_m^*)^2$. This is the standard bootstrap variance used in complete case analysis.

The total variance is then calculated according to the MI formula:

$T = W + \left(1 + \frac{1}{M}\right)Q$, where W is the within variance $W = \frac{1}{M} \sum_{m=1}^M U_m$ and Q is the between-imputation variance, $Q = \frac{1}{M-1} \sum_{m=1}^M (\alpha_m - \bar{\alpha})^2$ and the final estimator of interest is $\bar{\alpha} = \frac{1}{M} \sum_{m=1}^M \alpha_m$.

Estimating the coefficients and variance of interest for 20 countries in several rounds of adjustment is computation time-intensive, but using less than the 1,000 replicate weights makes the variance estimation less stable. So we face a trade-off between computation time and stability of the variance estimates, leading to the decision to use the first one hundred replicate weights for our purposes. This might lead to slightly incorrect standard errors, but it is sufficient to demonstrate that the standard errors can be quite large for several countries. Even the small standard errors we obtain for countries like Germany are significantly higher than those reported in Bach et al. (2015), where the replicate weights are not used at all. Observations from the Forbes rich list are assigned replicate weights of one.

Fourthly, the number of Households H within the two tax brackets applied for the revenue estimation (€ 1 million to € 5 million and everything above € 5 million) and the total wealth X within those brackets is obtained by using the following formulae:

$$H(a, b) = n \int_b^a f(w) dw \quad (9)$$

$$X(a, b) = n \int_b^a w f(w) dw \quad (10)$$

Fifthly, the study on the effects of wealth taxation in Switzerland by Brülhart et al. (2017) allows us to take into account the tax-induced response of the tax base on an empirically valid basis. Compared to other OECD countries, Switzerland has the highest, albeit decreasing taxes on wealth and especially on net wealth. Its federalised structure is

responsible for significant variation in net wealth taxation between the cantons and even municipalities. The high quality data used by Brülhart et al. (2017) allows the authors to produce desperately needed elasticities. Their finding that an increase of the tax rate on net wealth of 1 percentage point decreases the tax base by 35% appears as an enormous but rather plausible effect.

The proposed net wealth tax should be progressive, thus following the example of several existing and historical net wealth taxes. Indeed, a progressive tax schedule may be justified particularly based on potential negative social externalities by an over-accumulation of wealth motivated by status effects (Broadway, Chamberlain and Emmerson 2010). In addition, several other arguments, as supporting equality of opportunity by a certain extent of wealth redistribution, the ability of the very wealthy to achieve above-average returns, the existing under-taxation of capital incomes vis-à-vis earnings, or differing motives for wealth accumulation in lower compared to higher income/wealth groups, call for progressive wealth taxation. Our estimations of potential revenues from a European net wealth tax are based on a tax design similar to the one suggested by Piketty (2014), applying a simple progressive tax schedule with two tax rates: 1% for net wealth above € 1 million, 1.5% for net wealth above € 5 million.¹⁰ The effective tax burden on net wealth increases with decreasing returns on the taxed assets; the lower asset returns, the higher is the effective tax burden. The fiscal drag associated with a progressive tax schedule can be avoided by regular inflation adjustment of the tax brackets.

As HFCS data on net wealth refer to households, the proposed net wealth tax is levied on a household basis. Therefore, also tax exemptions pertain to the household level. As *Table* shows, usually tax exemptions are granted on an individual basis, mostly for each adult living in the taxed household, in some cases (though mostly at a considerable lower level) also for children. Our model deviates from this design and rather corresponds to the Swedish model applied until 2002, which granted a household-based tax exemption identical for singles and couples.¹¹ With a threshold of € 1 million, households would receive a rather generous basic allowance so that the tax can be targeted more closely at large wealth holders. The tax should be introduced based on a harmonised design by all EU Member States. As a prerequisite for effective enforcement of the EU-wide net wealth tax a European wealth register combined with some form of information exchange on wealth holdings abroad needs to be introduced.

¹⁰ Piketty (2014) suggests a two-tier tax schedule with 1% and 2%, alluding to the option to tax very high net wealth, for example above € 1 billion, at even higher rates of maybe 5% or 10%; however, for the sake of simplicity we base our revenue estimations on a two-rate-schedule.

¹¹ Since then, the tax exemption for couples is twice as high as the tax exemption for singles.

Our estimations yield potential revenues of € 155 billion (1.5% of total GDP) for the 20 EU Member States included (see Table 3). Considering the imminent exit of the United Kingdom, this estimate can serve as a good approximation to the potential revenues of a “true” EU-wide net wealth tax.

Differentiated for individual Member States, potential tax revenues range from 0.5% of GDP or less (Slovakia, Hungary, Estonia, Poland) to 2% or more (Belgium, Malta, Luxembourg, Cyprus). 8 out of the 20 EU Member States considered can expect revenues between 1.1% and 1.7% of GDP. Not surprisingly, for 6 of the in total 8 “new” Member States included (with Cyprus and Malta as exceptions) revenue/GDP ratios are estimated at below 0.9% of GDP. Similarly, in the “new” Member States (again with the exception of Cyprus and Malta) the share of affected households (who are liable for taxation as their net wealth is above € 1 million) is mostly well below 2% of all households. In comparison, in the group of 12 “old” Member States this share ranges between 3.1% (Portugal) and 19% (Luxembourg).

Effective tax rates, determined as relation between potential tax revenues and total net wealth, lie below 0.5% in most countries regarded.

By how much a European approach would in fact reduce the considerable elasticities found by Brülhart et al. (2017) is of course speculative. Their findings might at first sight be confusing, as the authors conclude that the mobility of people does not seem to be the driving force behind the reduction of the tax base when net wealth taxation is increased. However, this just means that instead of relocating their places of residence, people “adjust” wealth reported to tax authorities when taxation is increased. The mobility of financial assets certainly is an important factor in this “adjustment” process, especially as the authors’ findings also indicate that financial assets are more responsive to changes in net wealth taxation than non-financial assets. If an EU wide net wealth tax together with a (financial) wealth registry could reduce the elasticities found by Brülhart et al. (2017) from 0.35 to just 0.3, the taxation scheme outlined above would yield € 173 billion instead of the € 155 billion per annum estimated above.

Table 3: An EU-Wide Net Wealth Tax – Key Figures for 20 Selected EU Member States

Country	Total net wealth in billion €	Revenues in billion €	Revenues in % of GDP	Effective tax rate in %¹⁾	Affected households in %	α coefficients (standard errors)
Slovakia ²⁾	152	0.1	0.05	0,1	0.3	1,80 (0,396)
Austria	1,438	5	1.5	0,3	6.4	1,50 (0,086)
Spain	5,774	14.9	1.4	0,3	4.9	1,63 (0,093)
Belgium	2,395	7.9	2	0,3	9.2	1,60 (0,100)
Italy	8,950	28	1.7	0,3	5.8	1,53 (0,071)
France	9,957	31	1.4	0,3	5.6	1,55 (0,078)
Ireland	662	2.7	1.4	0,4	6.7	1,40 (0,078)
Germany	12,699	47.6	1.6	0,4	4.7	1,36 (0,062)
Netherlands	2,757	8.5	1.3	0,3	6.2	1,60 (0,082)
Portugal	888	1.9	1.1	0,2	3.1	1,78 (0,106)
Slovenia ²⁾	142	0.3	0.8	0,2	1.7	1,49 (0,183)
Finland	660	1.5	0.7	0,2	3.5	1,73 (0,084)
Malta ²⁾	68	0.2	2.5	0,3	10.0	1,65 (0,110)
Hungary ²⁾	286	0.3	0.3	0,1	0.4	1,80 (0,204)
Estonia ²⁾	70	0.1	0.5	0,1	1.3	1,62 (0,209)
Latvia ²⁾	61	0.2	0.8	0,3	0.7	1,24 (0,485)
Luxembourg ²⁾	219	1.1	2.2	0,5	19.0	1,32 (0,082)
Poland	1,671	2.1	0.5	0,1	0.8	1,56 (0,108)
Cyprus ³⁾	155	0.7	4.0	0,4	9.0	1,27 (0,113)
Greece	619	1.3	0.7	0,2	1.7	1,62 (0,125)
Total	49,623	155.3	1.5	0,3	-	

Source: Own estimations and calculations. – 1) Revenues in relation to total net wealth. – 2) Estimates without observations from the Forbes rich list. – 3) Due to insufficient data the financial assets and liabilities of Cyprus could not be matched with the respective national balance sheets.

6 Conclusions

EU-wide implementation of a net wealth tax based on harmonised tax provisions may serve as a first step in a longer-term oriented move of the stepwise expansion of net wealth taxes on a global scale in the form of concentric circles. Considering the global dimension of the taxing wealth issue (see, e.g., Hebous 2014; Zucman 2014), we are well aware of the limitations of an EU-wide approach. Nonetheless, we regard an EU-wide initiative as an important first step which could be rather easily implemented within the existing legal and political framework of the EU and could then be widened stepwise regionally. Zucman (2014) emphasises that a coordinated EU-wide approach would be capable to put non-cooperating countries and particularly tax havens under pressure to eventually join supranational agreements foreseeing measures as for example automatic information exchange or cooperation of fiscal authorities. The EU offers the legal and political framework required for such a tax coordination approach. In particular, the system of automatic information exchange in force as of 2017 could be expanded to include an EU-wide net wealth tax register, as one prerequisite to effectively combat tax evasion within the EU.

An EU-wide net wealth tax can be expected to yield substantial revenues which could be at least partially remitted by Member States to the EU as one pillar of a more sustainability-oriented tax-based EU system of own resources. It is important to note that the implementation of EU taxes does not necessarily require own genuine taxation powers, i.e. full legislative and revenue authority for the EU.¹² EU taxes can also be introduced based on a kind of remittance system as suggested in Raddatz and Schick (2003), with Member States' tax administrations collecting revenues and transferring them to the EU budget. This would reflect the central motivation of a sustainability-oriented EU tax approach: namely, that certain sustainability-oriented EU taxes are a powerful instrument to close sustainability gaps in taxation in the EU. To provide incentives for effective revenue collection, Member States should be granted the right to keep a share of the proceeds. Such a pragmatic approach would not require an explicit answer to the much more fundamental question whether the EU should be granted own taxation powers to support its further development (Büttner and Thöne 2016). It would also not restrict national tax sovereignty and might thus be more acceptable to (the overwhelming majority of) Member States' governments and parliaments reluctant to give up some of their taxation powers.

¹² For a detailed presentation and discussion of the legal aspects of implementing EU taxes see HLGOR (2016) and Waldhoff (2016).

Moreover, the establishment of an own EU tax authority incurring additional administrative costs would not be required.

Not least, by increasing perceived tax fairness through strengthening taxes for very wealthy individuals, whose tax payments are perceived by the general public as rather low, also due to the revelations of the Panama Papers and similar recent tax scandals, an EU-wide net wealth tax could be attractive to EU citizens and may thus further EU integration.

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