

How Should Capital Be Taxed?*

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Abstract:

This paper analyzes the appropriate role of capital taxation in advanced economies by synthesizing the research on optimal capital taxation. To highlight the redistributive role of capital taxation, we document robust correlations between labor income, wealth and capital income and present new evidence on the wealth holdings of the wealthiest. We assess distortionary effects of capital taxation and discuss critical issues in its practical implementation. Our overall conclusion is that there are good reasons to tax capital and that Nordic ‘dual’ income taxation could be a constructive way to strike a balance between an optimal and administratively feasible tax system.

Keywords: Optimal taxation, Capital taxation, Wealth tax, Inheritance tax, Income inequality, Wealth inequality.

JEL: D31, F38, H21, H24.

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1. Introduction

For a long time, there has been a substantial academic and political dispute regarding the appropriate role of taxes on capital in the overall tax system. Perhaps this controversy is not that surprising given the complex nature of capital. Capital is needed to fund investments in the economy, it serves as a vehicle for individuals to transfer resources across time, and it can provide consumption benefits, as in the case of housing wealth. Furthermore, capital can be transmitted across generations and it can be moved across jurisdictions. Empirical studies have shown that capital is more unevenly distributed than labor income and that the relative value of the capital stock has grown in wealthy nations in recent years. However, it is fair to say that a substantial uncertainty still remains regarding the economic effects of capital taxes and their role in the tax system.

The purpose of this paper is to analyze how personal taxes on wealth and capital income should be designed in advanced economies. We discuss the current theoretical research on the subject of capital taxation in an attempt to provide a unified discussion about the optimal taxation of capital with an eye towards practical policy recommendations.¹ The survey complements earlier articles on the connection between optimal tax theory and tax policy, such as Mankiw, Weinzierl and Yagan (2009), Banks and Diamond (2010), Diamond and Saez (2011) and Jacobs (2013).

Starting in the modern optimal tax literature, we ask what role taxes on capital and capital income should play in an economy where labor income is subject to progressive income taxation. At the core of the analysis lies an equity-efficiency trade-off. Taxes help finance the public sector and redistribution, but also have harmful effects on economic activity.

The theoretical discussion is divided into three parts. First, we analyze arguments against the taxation of capital income, focusing on distortions of capital income taxation on the inter-temporal allocation of consumption and physical investment. Second, we discuss various equity arguments in favor of capital taxation. These arguments are based on the fact that individuals are heterogeneous in various dimensions (such as in terms of their returns on investments, their preferences and their endowments of wealth) which implies that taxing capital income enables more redistribution than if labor income would be taxed alone. Third, we discuss efficiency arguments in favor of capital income taxation, such as the taxation of economic rents, reducing distortions on human capital and mitigating the distortions associated with progressive labor income taxation. We then discuss theoretical arguments against and in favor of specific taxes on wealth and capital, such as wealth taxation, property taxation, and inheritance taxation, adding a new angle to Piketty (2014) and Atkinson (2015).

¹ The paper builds in part on the Swedish policy report Waldenström, Bastani and Hansson (2018).

To shed light on the usefulness of capital taxation as a redistributive device, we empirically examine the size, composition and distribution of private wealth and capital income, as well as make several cross-country comparisons. Our empirical analysis documents correlations between labor income and different forms of capital and capital income, which are interesting from an optimal tax perspective, as they suggest a robust relationship between the ability to generate labor income and the ability to generate capital income. Furthermore, we present new estimates of the shape of the very top of the Swedish wealth distribution based on a newly assembled data set of Swedish billionaires. The distribution of capital has not played a prominent role in traditional theories of optimal capital taxation, but recent studies highlight its importance in such an analysis (for example, Saez and Stantcheva 2018).

We also survey the literature on behavioral responses to taxes on wealth and capital income to assess the distortionary costs of capital taxation as well as describe how capital is taxed in practice, comparing the role of capital taxation in different countries. Finally, we discuss the implications of hidden offshore wealth and information exchange agreements for the possibilities to tax personal wealth and capital income.

The paper is organized as follows. Section 2 reviews the theoretical literature on optimal capital taxation and the main arguments against and in favor of the taxation of capital. Section 3 describes the evolution of the stock of capital and its distribution and presents a set of key statistics. Section 4 discusses how capital is taxed in practice, offering several cross-country comparisons, and examines the literature on behavioral responses to taxes on wealth and capital income. Section 5 offers international perspectives on capital taxation, with a focus on the role of hidden offshore wealth and information exchange agreements. Finally, section 6 offers a concluding discussion, delivering a number of concrete policy recommendations, and discusses limitations and ideas for future research.

2. How should capital be taxed?

To approach the question of the most desirable way to tax capital, a framework for the analysis is needed that specifies the objective of tax policy as well as the relevant constraints facing the policymaker. Most of our discussion will be based on the modern approach to optimal taxation, initiated by Mirrlees (1971), where the government balances the gains from redistribution and the financing of several private and public goods, with the harmful effects of taxes on economic activity.

The starting point of optimal tax theory is the study of a population of taxpayers that differ in terms of their skills/capacities to earn income.² If the government could observe each individual's skill level, the tax planner could assign each individual a tax or transfer depending on their unique personal capacity to earn income. Such a hypothetical tax system would fulfill all of society's distributional objectives,

² Throughout this text, we will use the terms "skills", "abilities" and "capacities to earn income" interchangeably.

whatever those may be, without disrupting economic activity. Individual economic circumstances are not, however, observable to the government and individuals have no incentives to truthfully reveal them. For this reason, taxes must be based on observable characteristics and economic quantities, such as income or wealth. This causes economic distortions as individuals will change their income and wealth in response to taxation. It should be emphasized, that the economic costs of taxation (often referred to as excess burden or deadweight loss) are rooted in the information problem of the government, namely, the government's inability to verify individual earning ability. As we will explain in more detail below, capital taxes can serve an important function by mitigating the information asymmetry between the government and private agents.

Formally, an optimal income tax problem amounts to the maximization of a social welfare function which describes how the welfare of agents in the economy should be valued and aggregated. This maximization is subject to a set of incentive constraints and a government's budget constraint. The incentive constraints capture that individuals freely choose their desired income subject to the taxes set by the government. This implies that whenever the government attempts to raise the welfare of low-skill individuals through changes in taxes and transfers, it has to fear that high-skill individuals might adjust their income in an attempt to replicate the income of low-skill individuals in order to qualify for a lower tax burden. The social welfare function is typically formulated as a function of individual utilities. One such social welfare function is the 'Utilitarian' one where the government is maximizing the sum of individual utilities. The goal of redistributive taxation is then to equalize marginal utilities across individuals. Another social welfare function is the so-called max-min social welfare function, where the government's aim is to maximize the utility of the lowest skilled agent in the economy. If the lowest skilled agent in the economy does not work, the max-min social objective is equivalent to the objective of tax revenue maximization from the working population. Notice that the social welfare function embodies a normative assumption, and is specified by the researcher. Researchers often compute optimal policies under different social welfare functions with the hope of identifying desirable features of tax systems that are fairly robust with respect to these assumptions.³

The original Mirrlees (1971) model was static. However, subsequent contributions have also analyzed richer, multi-period, Mirrleesian economies. In such models, researchers need to specify how the labor productivity of agents evolves over time. A common approach is to view individual productivities as partially pre-determined (depending for example on inherited traits, the childhood environment, access to education etc.), partially evolving over time (as a consequence of circumstances, such as luck, and health conditions), and partially being the result of economic choices (such as the investment in education, on-the-job training etc.). This implies that, at any point in time, the distribution of utility depends

³ See Bastani and Lundberg (2017) for a comprehensive analysis of the implicit social welfare weights inherent in Swedish labor income taxation 1971–2012, assuming taxes have been set optimally.

on the initial heterogeneity in the economy (what individuals are born with), current and past realizations of economic shocks as well as individuals' past economic choices.⁴

A persistent feature of the economy is that capital income is more unevenly distributed than labor income. Thus, from a purely distributional point of view, capital taxes appear desirable as instruments to combat inequality. The relevant question, however, is to which extent capital taxation enables the tax system as a whole to more efficiently raise tax revenue and achieve distributional objectives. Our discussion about the optimal taxation of capital will focus mainly on the desirability of capital taxation in economies where labor income is already subject to progressive income taxation. The relevant question then becomes whether or not taxing capital income in addition to labor income allows for more income redistribution than what can be achieved with a non-linear tax on income alone. As we will discuss below, this requires that individuals with higher labor income (or more precisely, higher earnings ability) have disproportionately more capital income. Moreover, the fundamental task is to balance the equity gains from taxing capital income against the distortions of capital income taxation, in the form of distorted savings decisions, labor supply distortions and distortions in portfolio choice.

2.1 Recent developments in the literature

In the early macroeconomic models used to study optimal capital taxation, the analysis centered on the dynamic decisions of a representative individual, focusing purely on the efficiency properties of a tax system that raises a given amount of revenue. In these models, distributional concerns were absent. At the same time, introducing heterogeneity in terms of skills, as in the Mirrlees (1971) framework, did not appear to change the result that capital income should not be taxed, at least not in the simple setting of Atkinson and Stiglitz (1976).

Today, these models serve as important theoretical benchmarks. If all inequality in capital income originates from inequality in labor income (because of differences in work ability), it is perhaps not surprising to find an unimportant role for capital income taxation in the optimal tax system. The opposite extreme would be a situation where all inequality derived from inequality in capital income. In such a situation, the only way to achieve redistribution would be to tax capital income.

The major development in the recent research literature is that researchers now are beginning to explore the implications of individual heterogeneity beyond differences in labor market ability for the design of

⁴ The underlying reasons for why skills differ, matter for the interpretation of government interventions to reduce inequality. The extent progressive income taxation can be regarded as redistribution and the extent it can be regarded as insurance particularly carry weight in political discussions about the design of the tax system. In practice, making a distinction between redistribution and social insurance is difficult as it is hard for an empirical researcher to assess whether the inequality in outcomes that is observed in the data is the result of choices, predetermined characteristics, or chance (good or bad luck).

optimal tax systems.⁵ The most attractive reason to tax capital income, in our view, is the regular empirical finding that there is substantial heterogeneity in capital income conditional on labor income. This suggests that capital income taxes can complement labor income taxes in achieving redistribution. The normative implications of this heterogeneity depend on where the inequality in capital income derives from. The literature has recently highlighted, for example, heterogeneity in bequest behavior, in the likelihood to receive and give bequests, and in investment returns. All these heterogeneities can lead to a role for positive optimal capital income taxation.⁶ Moreover, recent progress has been made to connect theories of optimal capital taxation to the distribution of capital and the elasticity of capital supply with respect to the after-tax return (in terms of sufficient statistics). Saez and Stantcheva (2018) provide a framework in which many policy questions about capital taxation can be addressed, including the role of heterogeneous returns and differences in preferences for different types of wealth.

2.2 What is capital?

A tax on capital refers to any tax on the return to savings, capital gains, dividend income, firms' profits (corporate taxation), property taxation, inheritance/estate taxation and wealth taxation. Sometimes it is useful to divide these taxes into two categories depending on whether or not the tax is levied on an income stream (flow taxation) or on the stock of capital. In some cases, it does not matter from an economic perspective whether the stock or the flow is taxed. For example, if the annual rate of return on an investment is 4 percent, an annual wealth tax of 1 percent is equivalent to a capital income tax of 25 percent (in terms of the total annual tax burden). In the canonical life-cycle model of labor supply and savings, taxes on the stock and the flow are equivalent. However, as will be discussed below, if rates of return differ across individuals, or are uncertain, taxes on the stock of capital and capital income taxes are no longer equivalent. Moreover, wealth is a broader concept than income, which includes assets such as pensions and closely-held shares, which further break this equivalence from a conceptual point of view.

Capital is necessary for investment and as a vehicle for individuals to transfer resources across time periods. In addition, capital goods can provide consumption benefits. An investment in a house is a way to transfer resources into the future (savings) but the house also provides consumption benefits if it serves as a dwelling for its owner. Similarly, art, stamp collections, or rare artifacts provide the owner with utility in addition to serving as investment vehicles. Moreover, simply holding wealth (without it

⁵ The fact that a vast majority of studies of optimal capital taxation consider models with a single dimensional heterogeneity is not because scholars consider this to be the most appropriate assumption, but rather that there are severe mathematical difficulties involved in solving for optimal income taxes in economies with multidimensional taxpayer heterogeneity. The literature on optimal nonlinear taxation in the presence of multidimensional heterogeneity and multiple tax bases has been greatly advanced in recent years; see Golosov et al. (2014) and Lehmann et al. (2018). See also Hermle and Peichl (2018) who analyze optimal linear taxation of multiple tax bases.

⁶ Another type of heterogeneity stems from life-cycle considerations in overlapping generations models, as individuals in different ages have different capital income (even conditional on having the same labor income). In these models, capital income taxation becomes a substitute for age dependent taxation. We discuss this below.

necessarily being invested in a particular capital good) may provide individuals with utility due to the power and influence it may convey.⁷ The consumption component of wealth is one of the reasons why capital taxation is such a complex issue.

2.3 Why capital income should not be taxed

One way to approach the issue of capital taxation is to study a neoclassical growth model where an infinitely lived representative individual supplies labor supply in each time period and transfers resources across time periods through savings in order to smooth consumption.⁸ The savings of the representative individual finances the investments in the economy and the optimal tax problem is to design taxes on labor and capital income in every time period in order to reach a given amount of tax revenue in the most efficient way (maximizing the welfare of the representative individual). Since the model does not specify what the tax revenue should be used for, the theory does not address the possibility for capital taxation to contribute to a reduction in income inequality. In this research tradition, Chamley (1986) and Judd (1985) argue that the tax on capital should be zero in the long run.

The intuition for their result can be understood through the simple observation that capital income taxation becomes very distortionary over long time horizons. The reason is that the interest that is earned on the saving becomes more and more important to finance future consumption the further one looks into the future and it is the interest income that is taxed through capital income taxation. In the Chamley-Judd setup, individuals have unrealistic infinite planning horizons, which imply that this effect becomes very strong. In effect, it implies that the elasticity of savings becomes infinite.⁹ Therefore, to raise the exogenously imposed tax revenue requirement, the government is better off to use only labor income taxation in a long-run equilibrium of this economy.¹⁰

⁷ This is one reason for putting wealth in the utility function (Saez and Stantcheva 2018).

⁸ The infinite horizon of the representative individual can be interpreted as an infinite dynasty where different generations are perfectly linked through inheritance.

⁹ This is also the reason why subsequent studies have found that the zero capital income tax result is surprisingly robust and that only weak assumptions regarding the structure of individuals' preferences are needed (Atkeson, Chari and Kehoe 1999). However, the general applicability of the result has been questioned on mathematical grounds by Straub and Werning (2014). See also Jacobs and Rusu (2017).

¹⁰ The main message of Chamley-Judd should however not be completely dismissed, since even for modest planning horizons, the compounding effect of capital income taxation can become quite strong. This is considered by some as a reason to tax pension savings and other long-term investments more leniently. Diamond (2009) presents an illustrative example highlighting that a 30 percent tax on capital income only imposes a wedge of 3 percent between consumption today and consumption tomorrow (if the return is 10 percent) but that the tax wedge becomes 67 percent between consumption today and 40 years into the future. This should be compared with a 30 percent income tax, which implies a wedge of 30 percent between income today and consumption today.

The unrealistic infinite planning horizons reflect the decisions applying for a dynasty, where different generations are perfectly connected through altruistic bequests. This neglects the inequality that is created over time between individuals who receive and individuals who do not receive inheritances (which we come back to below).

A different departure point to study the taxation of capital income are models building on Mirrlees (1971) where individuals differ in their ability to generate labor income and tax revenue is used to finance public expenditure and redistribution. In contrast to the Ramsey-type optimal tax problem analyzed by Chamley-Judd, this class of models generates an equity-efficiency trade-off. The question then becomes: Does the taxation of capital income enable redistribution at a lower efficiency cost?

Atkinson and Stiglitz (1976), henceforth AS, one of the most influential studies in public finance has by many scholars been interpreted to imply that capital income should not be taxed (although this is viewed by many as an unfortunate misinterpretation and oversimplification of the issue of capital taxation, see Stiglitz 2018). Their fundamental contribution was to provide conditions under which it is more efficient to use progressive income taxation to redistribute income, rather than employing differentiated commodity taxation, since this avoids distorting the consumption choices of individuals. The AS result has subsequently been used to argue that capital income should not be taxed as consumption in different time periods can be seen as different commodities. Specifically, a tax on capital income makes consumption tomorrow more expensive than consumption today which is undesirable in the setup of AS. While intuitively appealing, the result is not robust to perturbations in the modelling framework.

First of all, AS analyzed a model where individuals live for two time periods, and work only during the first (later studies have extended the analysis to life spans over several periods). A zero tax on capital income is then optimal only if the labor income tax is allowed to be a complicated function of current annual income, as well as annual income each year in the past. Such labor income taxation does not exist in practice, restricting the policy relevance of the application of the AS result to the issue of optimal capital income taxation.

Second, and perhaps most importantly, a fundamental restriction of the AS framework is that individuals are assumed to differ only along a single dimension. This implies that all inequality in capital income originates from individuals' labor incomes (and labor earning abilities, in particular). Later in this section, we discuss how heterogeneity in additional dimensions, for example, the form of inheritances received or differences in returns to investment, creates robust reasons to tax capital income.¹¹

¹¹ Another case where the AS results break down, is when investment affects the remuneration of low and high skilled labor differently. Pirttilä and Tuomala (2001) show that if an increase in investment leads to a decrease in the relative wage of low-income households, then a positive tax on capital income is desirable. The reason is that

2.4 Equity arguments in favor of taxing capital income

As we have already mentioned, the workhorse models of optimal taxation build on the assumption that individuals only differ with respect to their earnings abilities. This implies that differences in wealth across individuals solely derive from differences in skill and effort in the labor market. Some recent studies shed light on the fact that individuals differ in other important dimensions, which implies heterogeneity in wealth conditional on labor income. If these additional attributes correlate with individuals' earnings abilities, taxes on capital become useful as indirect means to tax people with high ability.¹² This relates to the fundamental information problem in the optimal income tax literature. In the case described above, a tax on labor and capital income can achieve more redistribution than a labor income tax alone since capital income contains valuable information about individuals' hidden earnings abilities. Empirically, high-income individuals save a greater fraction of their income than low-income individuals do, which potentially can be explained by differences in savings behavior between low- and high-*skill* individuals.¹³

2.4.1 Heterogeneity in returns

In traditional models, individuals are assumed to earn the same risk-adjusted return on their investments. There is however a growing empirical literature documenting sizable differences in returns across individuals.¹⁴ If individuals with high labor earnings ability also have higher ability to generate a high return on their investment, because of access to social networks, information, or due to the economies of scale, forces working in favor of positive optimal capital taxation arise. For example, either highly skilled agents could achieve a higher rate of return by redirecting some of their time from labor supply into activities that raise their return on investment or they could simply be assumed to be inherently better investors.¹⁵ A small literature has also investigated the optimal tax implications of allowing for idiosyncratic investment uncertainty, a topic which we discuss in section 2.5.2 below.

2.4.2 Heterogeneity in preferences

In traditional models, individuals have the same time preferences for consumption. If high skill individuals have a higher taste for future consumption than low skill individuals, high skilled individuals will save more, even if they have the same income as a low skill individual. This implies that capital income should be taxed. The relationship between preference heterogeneity and optimal capital taxation has been analyzed in a few recent contributions (see Saez 2002, Diamond and Spinnewijn 2011 and

discouraging savings through capital income taxation reduces wage dispersion, which in turn makes progressive labor income taxation more efficient.

¹² Banks and Diamond (2010), one of the background chapters to the Mirrlees Review, consider this to be one of the most compelling reasons to tax savings.

¹³ See, for example, Dynan, Skinner and Zeldes (2004).

¹⁴ See Bach, Calvet and Sodini (2017).

¹⁵ See Gahvari and Micheletto (2016), Kristjánsson (2016), and Jacobs et al. (2018) for recent contributions.

Golosov et al. 2013). In this context, an important question is the following: should the government penalize individuals who prefer to consume tomorrow rather than today? Does it matter if the differences in savings behavior are the result of individual mistakes (for example, failure to estimate how much one values consumption at retirement)? These difficult questions have attracted some attention in the recent literature. For example, the issue of the treatment of pension savings in the tax system when individuals are subjective to self-control problems or cognitive biases, and the appropriate role of the government to deal with such issues has been analyzed by Moser and Silva (2017) and Hosseini and Shourideh (2017).

2.4.3 Heterogeneity in endowments (inheritance)

What are the implications of inheritance for the optimal taxation of capital?¹⁶ Cremer, Pestieau and Rochet (2003) analyze a model where individuals have the same preference for saving, but instead differ in terms of their endowments/inheritance (assumed to be exogenous). If there is a positive correlation between endowments and earnings ability (for instance, due to a genetic correlation in earnings ability across time) this implies that two individuals with the same labor income, but with different abilities, also differ in terms of the amount they can consume because of their endowment. This implies that these two individuals have different demand functions for goods (including future consumption) and provides a motivation for taxing capital income. This argument relies on the government not being able to observe inheritance; otherwise, all differences in initial endowments could be eliminated through confiscatory taxation.¹⁷

Farhi and Werning (2010) allow, in contrast to Cremer et al., bequests to be taxed analyze the properties of an optimal estate tax. They focus on two generations where all capital (and inheritance) derives from the work efforts of the first generation. Individuals in the second generation will be heterogeneous in terms of the bequests they receive depending on who their parents are. In such a framework, they show that if one considers the welfare of the parents (those who give bequests) but not the welfare of the children (those who receive bequests) then the inheritance tax should be zero, essentially in line with the AS theorem. When also considering the welfare of those who receive bequests, then they find that it is optimal with a progressive (negative) inheritance tax which subsidizes inheritances, but with a degree of subsidization that decreases in the size of the inheritance. If it is not possible to subsidize inheritance for some exogenous reason, the degree of subsidization will be zero for all but the largest inheritances, which should be taxed. The usefulness of the progressive estate tax is that it equalizes the bequests that people receive, which raises the welfare of the second generation.

¹⁶ The discussion here complements earlier surveys on the topic, such as Cremer and Pestieau (2011).

¹⁷ See also Brunner and Pech (2012) for an extension.

Farhi and Werning (2013a) build upon Farhi and Werning (2010) and highlight the fact that parents differ in terms of how altruistic they are towards their children. This creates inequality between children depending on the preferences of their parents to bequeath to their children, even conditional on the earnings abilities of the parents. The optimal estate tax considers that inheritance taxation discourages labor supply activity of parents, while it levels the playing field of the child generation. In comparison to their earlier study, Farhi and Werning (2013a) find it can be optimal to tax inheritance if the principle of equality of opportunity carries sufficient weight in the objective function of the tax designer, which they argue could be an explanation why inheritance taxation exists in many countries.

A restrictive assumption in the analysis of Farhi and Werning (2010, 2013a) is that they examine a two-period model, with one generation of parents who give bequests and one generation of children who only consume. Piketty and Saez (2013) study a more realistic setup where each generation both gives and receives bequests. This implies that those who bequeath to a greater extent are those who have inherited in the past. In addition, their analysis considers a correlation in earnings abilities across generations, which implies that those who receive large inheritances are more likely to also be individuals with a high earnings ability. Similar to Farhi and Werning (2013a), the results of Piketty and Saez (2013) derive from the assumption that individuals differ not only in terms of their earnings abilities but also in terms of their altruism towards their offspring. The fact that earnings abilities are no longer the unique determinant of life-time resources is the main reason for the finding of positive inheritance taxation in their model.^{18 19}

To sum up the insights from the above-mentioned papers, we can conclude that a positive correlation between earnings ability and inheritances received as well as the circumstantial nature of inheritance due to parental altruism heterogeneity are arguments favor of inheritance taxation. However, the “double-dividend” of giving (referring to the fact that inheritance provides utility not only to the donor but also to the recipient) represents a serious challenge in assessing the welfare effects of inheritance taxes that has not yet been resolved. The benefit to the recipient is an externality, and therefore motivates to tax bequests less than other consumption goods.²⁰

¹⁸ For mathematical reasons, Piketty and Saez restrict attention to a linear inheritance tax. Their analysis is therefore not informative about optimal progressive inheritance taxation, analyzed by Farhi and Werning.

¹⁹ De Nardi and Yang (2016) quantitatively analyze inheritance taxation in the US. In their model, individuals are born with different circumstances, both with respect to inheritance and in how much their parents have invested in their human capital (alternatively, allowing for a genetic correlation in ability across generations). They find that in the long-run equilibrium, estate taxes of inheritances over a certain threshold have small or insignificant effects on the capital accumulation of the economy, but can deliver large welfare gains for a newborn who do not know in which economic environment they will grow up, while generating large welfare losses for the very rich.

²⁰ See Boadway and Cuff (2015) for a recent discussion.

2.5 Efficiency arguments in favor of taxing capital income

2.5.1 Reducing distortions on human capital accumulation

One of the most important objections to the Chamley-Judd analysis concerns its assumption that only capital accumulates over time. In economies with progressive income taxation, an equally serious concern should be to provide incentives for individuals to invest in education, exert effort on the job, and advance in their careers. That is, the accumulation of human capital can be just as important as the accumulation of physical capital. Jacobs and Bovenberg (2010) analyze the role of human capital accumulation for the desirability of taxing capital income. They find that, in a model where not all education investments are verifiable by the government, and therefore cannot be directly subsidized, a positive tax on capital income serves to alleviate the distortions of the labor tax on human capital accumulation. The intuition is that labor taxes encourage individuals to substitute human by financial assets. The optimal capital tax trades off the distortions on the overall level of total savings and the composition of saving (human vs financial assets), which can lead to positive capital taxation. Importantly, the result in Jacobs and Bovenberg does not depend on non-separable utility, heterogeneous preferences, or financial market failures. Since that study, there has been a surge of papers emphasizing the importance of considering human capital accumulation in optimal tax analysis. Stantcheva (2017) is a recent contribution that further discusses this strand of the literature.

2.5.2 Taxing economic rents

The literature on optimal income taxation has almost exclusively analyzed how the so-called “normal” return to savings should be taxed (such as the return to an average investment or the yield of a government bond). As acknowledged above, returns are likely to be heterogeneous across individuals. If an individual earns a return on an investment that is greater than the normal rate of return, this is an “excess return”. If excess returns reflect chance events (and not factors over which individuals exert control), they are viewed as “economic rents”, which can be taxed without distortions. On the other hand, if excess gains are the result of productive economic activity, taxing excess returns entail distortions.

An important difference between a tax on the stock of capital (a wealth tax), and a capital income tax is the taxation of excess returns. If the normal return on an investment is 5 percent, a capital income tax of 20 percent is comparable to a wealth tax of 1 percent. However, for individuals who receive a return greater than 5 percent, they will have to pay tax on the excess return under capital income taxation, but not under a wealth tax.

Most of the theoretical research on the optimal design of capital taxation departs from models where a single asset is used as vehicle for consumption smoothing and to fuel investments in the economy. To usefully analyze the taxation of excess returns, one can consider a framework where individual investors to choose between risky and safe assets. The standard model to analyze this issue goes back to Domar

and Musgrave (1944) which was further generalized by Stiglitz (1969).²¹ The main message is that, under certain conditions, investors who are faced with a capital income tax with full loss offset (implying that losses can be deducted from the tax base) can change their choice between risky and safe assets in such a way so as to obtain the same expected after-tax return on their investment as in a no tax situation. The reason is that the capital income tax provides insurance that allow agents to increase the risk of their portfolios, mitigating the effect of the tax on the after-tax return.

It is a difficult, but important, empirical exercise to determine to which extent the taxation of excess returns represents taxation of economic rents and to which extent it represents distortionary punishment of highly skilled investors. Most economists would probably agree that it is desirable to tax excess returns, and the academic discussion has mostly centered on the whether or not to tax the normal return to savings. The Mirrlees Review (Mirrlees et al. 2011) recommends taxing excess returns but not taxing the normal return to savings. Notably, this policy advice goes against their background report, Banks and Diamond (2010). The main argument in Mirrlees et al. (2011) is that the taxation of the normal rate of return violates principles of neutrality in the tax system.²² However, the purpose of the tax system is not to achieve neutrality, but to maximize social welfare. Thus, capital income taxation must be judged by how it interacts with the desire to redistribute income at the lowest efficiency cost. Few studies, however, have analyzed the optimal taxation of capital income in models featuring idiosyncratic investment risk and ex-ante heterogeneous individuals. An exception is Spiritus and Boadway (2018). These authors build upon the works of Gordon (1985), Christiansen (1993) and Schindler (2008), and develop a general framework to analyze the question whether the exemption of the risk-free component of capital income (normal rate of return), as recommended by the Mirrlees Review, continues to hold when some assets earn excess returns. In the standard mean-variance portfolio framework where returns to private investment satisfy constant returns to scale (and hence, do not include rents), taxing excess returns and exempting normal returns (as in the Mirrlees review) is optimal. If, on the other hand, there are returns to scale in private investments, the normal return to capital should be taxed when returns to scale in investment are increasing, and subsidized when they are decreasing. Notice that these results apply in a model where all other arguments for positive capital taxation discussed in this section explicitly have been ruled out.

²¹ See also Atkinson and Stiglitz (1980).

²² Norway allows, since 2006, a tax-free normal rate of return on investments in stocks. According to Sørensen (2005) this system does not distort firm's marginal investment decisions and how these investments are financed within the firm. This conclusion has been criticized by Lindhe and Södersten (2012) who suggest that neutrality of this kind is not fulfilled when returns to investments largely are determined by international capital markets. In this paper we focus on capital taxation at the personal level.

2.5.3 Correcting capital market failures

Atkinson and Sandmo (1980) is a seminal study of capital taxation in an OLG framework where each generation lives for two periods, working in the first, and being retired in the second. In this setting, they found that it can be desirable to tax capital income for a reason related to the well-known property of OLG models, namely that the economy does not always reach its full production capacity since current generations do not consider the effects of their savings on future generations (each generation lives for a finite period whereas the economy lives forever). This dynamic inefficiency can effortlessly be corrected if the government is free to issue public debt or is allowed to use age-dependent lump-sum transfers. However, when there are restrictions on the use of such instruments, a positive capital tax can be desirable as it enables redistribution between different generations.

Atkinson and Sandmo demonstrated that a positive tax on capital income can be desirable in order to induce agents to save more if the income effect on savings is sufficiently strong. Moreover, a positive capital tax can finance tax reductions on labor, which can be a way to make younger generations save more. At the end of the day, it is however unclear how large of a role intergenerational redistribution issues should play when designing taxes on labor and capital. There are other ways to redistribute between generations that are more effective, for example by adjusting the pension system. The Atkinson-Sandmo framework also only considered a model with a representative agent. Later studies have analyzed OLG models with redistribution motives both between and within generations (due to skill heterogeneity), which makes the policy implications of dynamic inefficiency less clear.²³

2.5.4 Correcting insurance market failures

A well-known situation, in which the models of Atkinson-Stiglitz and Chamley-Judd lead to a positive capital income tax, is when future earnings are uncertain. In a perfect market, individuals would be able to handle the prospect of an uncertain income by borrowing in periods with low income and pay back these loans when incomes have recovered. The problem is that the market is not perfect, individuals cannot always borrow, and there are many risks that are difficult or impossible for individuals to insure themselves against. This can give rise to precautionary savings, where individuals save in periods with high income to secure their consumption in periods with (unexpected) low incomes.

Aiyagari (1995) considered an infinite-horizon model where individuals are borrowing-constrained, face uninsurable uncertainty about their future wages, and only decide about how much to consume in each time period. The borrowing constraints prevent individuals from insuring against idiosyncratic shocks, implying precautionary savings. In this setting, Aiyagari showed that the incompleteness of markets could lead to an over-accumulation of capital, which motivates positive capital income taxation to reduce this over-accumulation and move the capital stock closer to the level prevailing with complete

²³ See Conesa, Kitao and Krueger (2009) and Bastani, Blomquist and Micheletto (2013).

markets.²⁴ This is related to the capital market failure that happens in OLG models, discussed above. However, in the Aiyagari economy, the government cannot use public debt to correct the market failure and move the economy to the optimal level of capital accumulation.

The distinction whether or not individuals face deterministic or stochastic productivity profiles over their life cycle also matters for the desirability to tax savings in models analyzing *nonlinear* income tax systems. If individuals face uncertainty regarding their future productivity, individuals might self-insure through their savings. This precautionary motive to save implies a negative impact on labor supply. The reason is that individuals tend to save “too much” (depending on the third derivative of the utility function) and will bring the same amount of savings into the future, irrespectively of if they realize a high or a low productivity in the future, which has a negative effect on labor supply in both states. The provision of insurance over the life cycle in response to uncertain productivity is the focus of the so-called *New Dynamic Public Finance* literature (see Golosov et al. 2006).²⁵ Dynamic uncertainty seems, however, to be of secondary importance to the taxation of capital income, as suggested by Farhi and Werning (2013b) and Bastani, Blomquist and Micheletto (2013).

2.5.5 Reduce distortions on labor supply

In the early public finance papers, it was common to analyze models where individuals work only in the first period of life. The subsequent literature has analyzed the optimal taxation of capital income in lifecycle models where workers work in multiple periods. In such a setting, age-dependent labor income taxes become desirable due to age-specific labor supply behavior.²⁶ Erosa and Gervais (2002) show that if age dependent labor income taxes are not available, and (realistically) individuals’ life-cycle productivity profiles are not flat, positive capital income taxes are desirable because they can serve as a substitute for age dependent labor income taxation. The intuition is that if consumption is a stronger complement to leisure later in life, as compared to earlier in life, it is optimal to tax savings in order to boost labor supply and reduce the distortions associated with labor income taxation. This is reminiscent of the classic result by Corlett and Hague (1953) recommending that goods complementary to leisure should be taxed. However, the reason for a positive tax on capital income in life-cycle models survives even if the utility function is weakly separable between consumption and leisure, making it an inherently dynamic result.²⁷ The life-cycle elements in labor supply is one of the essential features of the economy analyzed by Conesa, Kitao and Krueger (2009), who find a positive and sizable optimal tax on capital income in their simulations calibrated to fit the US economy.

²⁴ Borrowing constraints are common components of modern models used to analyze capital income taxation, such as Conesa et al. (2009).

²⁵ Two of the most important papers in this literature are Albanesi and Sleet (2006) and Golosov et al. (2016).

²⁶ These effects are present in any life-cycle model, not only models where generations overlap (OLG).

²⁷ See propositions 3.2 and 3.3 in Erosa and Gervais (2002).

The early literature analyzing capital income taxation in dynamic frameworks considered economies with a representative individual and with a focus on linear (proportional) tax instruments (and in the case of Erosa and Gervais 2002, a representative individual within each generation).²⁸ The following literature has analyzed richer dynamic models where agents are heterogeneous in skills, work in multiple periods, and face deterministic or stochastic productivity profiles over their life cycles. The goal of the social planner in these settings is to achieve redistribution or insurance at the lowest efficiency cost. These models imply that, in general, it is optimal to tax savings since individuals tend to react to progressive income taxation by working less and consuming their savings. This result is similar to the motivation for taxing savings that occur in life-cycles models of the type studied by Erosa and Gervais (2002). Here, consumption late in the life cycle is more complementary to leisure than is consumption early in the life cycle. However, a key difference is that the taxation of savings in dynamic Mirrlees models arises from the desire to redistribute income (or provide insurance) through nonlinear income taxation and the taxation of savings enables to counteract the distortions associated with income taxation and thereby perform redistribution at a lower efficiency cost. To see this most clearly, consider the case of a high wage thirty-year-old. If this person anticipates having a high wage also when in his/her fifties, he/she might choose to work less when in his/her fifties. The benefit of doing so would be that, when this person is in his/her fifties and is working less, he/she would have the same income as a low-wage person working full time and, if there is progressive income taxation, qualify for a lower tax burden. However, the high-wage person would save a larger amount as compared to the low wage person, and therefore be able to consume more. Taxing savings implies that such reduction in labor supply in response to progressive income taxation becomes less attractive.

The desirability of taxing savings to improve the efficiency of the tax system crucially depends on the sophistication of the income tax available to the government. If the government could impose different taxes on individuals in different ages then high wage individuals in their fifties could be provided with age-specific incentives to supply high amounts of labor without the need to disrupt the incentives of thirty-year olds. However, in contrast to the analysis of optimal capital taxation in representative agent models, the presence of within-generation heterogeneity makes it desirable to tax capital income even if the labor income tax is allowed to be age dependent. If the labor income tax is even more sophisticated, however, so that it can be both age and *history* dependent (depending on the present and past labor incomes of an individual) then the gains of taxing savings to combat labor income tax distortions

²⁸ There are some exceptions, such as the paper by Ordober and Phelps (1979), that considered the optimal nonlinear taxation of labor and capital income in an OLG model where agents are heterogeneous in skills, as in Mirrlees (1971). However, in these papers, individuals typically supplied labor in the first period and were retired in the second.

becomes smaller or disappear completely.²⁹ In the above example, an individual supplying a high income when young could be rewarded if he/she continues to earn a high income as middle-aged if the income tax is history dependent, mitigating adverse effects of savings on future labor supply.

2.6 Efficiency effects of inheritance taxation

In policy discussions about inheritance taxation, a few specific efficiency considerations frequently present themselves. First, inheritance can have negative effects on government revenue if those who receive an inheritance work less (an income effect).³⁰ From this perspective, inheritance taxation can provide additional positive effects on government revenue beyond the direct mechanical effect (this is sometimes labelled a positive “fiscal externality”). Second, taxing inheritance may make it less attractive for parents to work if a motivation for working is the possibility to transfer resources to the next generation. Third, to the extent that bequests are accidental, taxing them is efficient.³¹ The literature on optimal inheritance taxation is not conclusive, and further work is needed to understand how these aspects affect optimal tax analysis. Moreover, further research is needed in order to understand why individuals bequeath their wealth. This is relevant both when assessing welfare effects and when assessing the effects on labor supply. Finally, we may note that there are other transfers to children that are not taxed, such as human capital investment. This means that inheritance taxation might distort parent’s decisions about how to invest in their children.

A recurrent issue with the inheritance and gift tax is how business assets should be treated, in particular those relating to the generational succession of family firms. Many countries have introduced reliefs for these asset types. A common motivation for such reliefs is the liquidity problems that may arise which potentially may require heirs to sell their shares to finance the payment of the tax (and then potentially incur additional taxes when latent capital gains become realized). Valuation problems are another common motivation for implementing special reliefs for inherited business assets.³²

2.7 The Nordic ‘Dual’ income tax system and the backstop function of the capital income tax

The optimal tax on labor and capital income is likely to be a fully nonlinear function of both labor and capital income. In other words, individuals with low and high labor income should face different capital income taxes and optimal capital income taxes are likely to be progressive, namely, the capital income tax rate is different for individuals with low and high levels of capital income. In practice, tax systems

²⁹ In fact, with deterministic productivity profiles, zero taxation of capital income is optimal if the income tax is history dependent.

³⁰ See Kindermann et al. (2017) for a recent contribution assessing the importance of this effect.

³¹ However, Blumkin and Sadka (2004) and Cremer, Gahvari and Pestieau (2012) question the desirability of 100 percent taxation of accidental bequests.

³² Gifts transmitted during a person’s life, *inter vivos*, represent an important part of total lifetime transfers. For this reason, inheritance taxation must be accompanied by gift taxation. Taxing inheritance and *inter vivos* gifts is commonplace in the industrialized world. A majority of EU’s member currently tax intergenerational transfers, and such taxes exist in a number of large Asian and North American countries.

do not take this advanced form. One reason is the problems of tax arbitrage. If one tried to tax savings through a nonlinear function, there would be large incentives for someone with a high marginal tax on savings to ask a friend or a relative with a lower marginal tax on savings to save for him. This is essentially the same argument that prevents the nonlinear taxation of commodities, namely, the difficulties for the government to observe and verify personal consumption levels.

The US and many other countries adopt some form of the so-called *comprehensive income tax* where the sum of labor and capital income is taxed together according to a nonlinear tax schedule.³³ A benefit of the comprehensive income tax is that it taxes all sources of income, at the margin, at the same rate, which reduces incentives for tax planning (cross-base shifting). However, according to optimal tax principles, taxing labor and capital income at the same rate is sub-optimal.

A more flexible system is the Nordic so-called *Dual Income Tax*, which combines the progressive taxation of labor income with the proportional taxation of capital income.³⁴ From an optimal tax perspective, such a system has the desirable feature that the capital income tax rate and the labor income tax rate can be made different for high-income earners. At the same time, an optimal dual income tax must consider the possibility for individuals to shift between the labor and capital income tax bases.³⁵ The latter is usually presented as an argument in favor of not making the difference between the top marginal labor income tax rate and the proportional capital income tax rate too large. In particular, it is an argument for a positive tax on capital income.³⁶

Appropriately calibrating the marginal tax rates on labor and capital income in the dual income tax system is an important task. As discussed above, optimal marginal tax rates on labor and capital income are not necessarily the same. The appropriate calibration of these tax rates depends on both equity and efficiency factors. From an efficiency point of view, the elasticities of the labor and capital income tax bases as well as the elasticities of cross-base income shifting. Kleven and Schultz (2014) find that the elasticity of capital income is two to three times as high as the elasticity of labor income using Danish data, suggesting a lower tax rate on capital income. From an equity point of view, the calibration of

³³ Such systems are based on the notion that it is the sum of all incomes that is relevant to the well-being of individuals. In addition, having individuals with the same total income pay the same income tax can be argued to respect the principle of horizontal equity. In practice, however, the comprehensive income measure that is available to tax authorities is seldom a complete account of all the sources of income that are relevant to an individual's welfare, as there are sources of income that are not observable, such as the intra-family transfers and unrealized capital gains.

³⁴ The progressive taxation of labor income is administratively feasible by virtue of the now widespread use of third-party reporting of income to the tax authority (Kleven et al. 2011).

³⁵ Alstadsæter and Jacob (2016) have found evidence of income shifting in Sweden among business owners by using a reform in 2006 in which both the tax differential and the amount eligible for reclassification increased. Pirttilä and Selin (2011) study similar questions in Finland and find evidence of income shifting, especially among the self-employed.

³⁶ See Christiansen and Tuomala (2008) for a theoretical argument in favor of taxing capital income due to the possibilities for income shifting. See also Selin and Simula (2017) for a recent analysis of the social welfare effects of income shifting.

optimal tax rates depends on the correlation between the labor and capital income tax bases and the welfare of individuals. An attempt to calibrate these tax rates is being made in Saez and Stantcheva (2018). In the case where they allow for nonlinear taxes on labor and capital income, and the elasticity of capital income is higher than the elasticity of labor income, the structure of capital income tax rates appear relatively flat, and are lower than labor income tax rates. This suggests that the dual income tax system, with a proportional tax on capital income, at a lower rate than the marginal tax rate on labor income, might not be that very far from optimal. However, further research is needed to quantify the welfare losses associated with adopting simple tax systems, such as the dual income tax system, using realistic measures of cross-base income shifting.

2.8 The taxation of different types of investments

As mentioned above, most of the theoretical research on the optimal design of capital taxation departs from models where a single asset is used as vehicle for consumption smoothing and to fund investments in the economy. We briefly discussed the implications of allowing individuals to choose between a safe and a risky asset. In practice, individuals invest in other assets as well that have special properties. In reality, individuals choose how to allocate their savings between financial assets, pensions, housing and closely-held businesses. In this context, an important aspect that is often overlooked is the distinction between wealth and capital. Not all savings and wealth is productive and facilitates physical investment. In this paper, we focus on capital taxation at the personal level, and going into detail into how these taxes affect production and firm activity (e.g., the effects of capital taxation on innovation and entrepreneurship or the implications of reduced domestic saving on domestic investment in a world where firms have access to international capital markets) would be out of the scope of the present paper. We will, however, discuss a few theoretical benchmarks and general viewpoints below.

The conventional wisdom among economists is that, when there are multiple assets categories, the returns to investment in these assets should be taxed uniformly. This is sometimes referred to as ‘neutral’ capital income taxation. This avoids not only distortions in consumer choices (to the extent that assets provide consumption benefits), but also avoids distortions in production. The rationale for uniform capital income taxation to avoid production distortions is based on the so-called production efficiency theorem developed in the seminal contribution of Diamond and Mirrlees (1971). In short, the result relies on the observation that taxing different input factors in different ways distorts production, and these distortions, in the end, manifest in the form of different consumer prices. As the effect of the input tax differentiation can be replicated by using differential taxation of final consumption goods, eliminating the differential taxation of production inputs and replacing it with differential taxation of final commodities can generate a Pareto-improvement, as this will increase total output produced in the economy. The Diamond and Mirrlees analysis relied, however, on some rather specific assumptions, such as that pure profits can be fully taxed. If this is not the case, it is desirable to impose higher tax rates on input

factors used in sectors characterized by imperfect competition or assets where price increase mainly reflect economic rents (Dasgupta and Stiglitz 1972). It should also be pointed out that the production efficiency theorem should not, however, be interpreted as an argument against taxing capital income in general, as clarified by Diamond and Saez (2011).

The most important argument in favor of uniformity, however, is that it is an important benchmark case and usually regarded as a useful principle in modern tax systems. It is very difficult to know what an optimal capital income tax differentiation would look like since the optimal differentiation would depend in a complex way on a host of elasticities of substitution in consumption and production and properties of the financial markets.³⁷ Moreover, uniform taxation is also valuable to suppress attempts of special interest groups to pressure politicians to modify the tax system.

2.8.1 Taxation of wealth

A wealth tax is a tax on the stock of capital. In principle, wealth taxes would not be needed if all income sources that form the basis of wealth would be taxed. Since inheritance is the intergenerational transmission of wealth, the same argument could be made about inheritance taxation. Nonetheless, many countries do tax both wealth and inheritance. One main motivation for this is that the wealth distribution is a function of not only the present design of the tax system, but also the design of the tax system in the past, as well as present and past opportunities for tax evasion, tax arbitrage and tax planning. In a sense, wealth and inheritance taxation can be viewed as ways to compensate for inability to tax income optimally in the past. This can be due to an inability of the government to tax certain kinds of hard-to-observe income, but also due to political or administrative failures.

The wealth tax base is not easy to define. According to the official wealth definition in the UN's System of National Accounts, private wealth includes not only real estate, bank deposits, bonds, corporate equity etc., but also all funded insurance savings in life insurance and occupational pension schemes. Including the latter in the tax base not only creates administrative challenges but can also imply an unreasonable tax burden for many low-income households. However, excluding insurance and occupational pension schemes from the tax base distorts investment choices. One major problem is the valuation of assets, especially the equity of non-listed firms. In the absence of secondary market prices, these firms have to be valued based on accounting information and errors in the valuation creates both uncertainty and potential liquidity problems. In an attempt to respond to such problems, most countries introduced reliefs, and even total exemptions, on business assets. While these measures alleviated some problems, they represented a departure from the conceptually advantageous broad-based feature of the general wealth tax. Finally, international mobility of capital is seen as a severe problem for the wealth tax. Even if we still do not know much about how important this constraint is in reality, cross-border

³⁷ Sørensen (2007) provides a more elaborate discussion of capital tax neutrality and open-economy issues.

capital flight represents a credible criticism against wealth taxation. Nonetheless, wealth taxation might be one of the few ways to tax business assets representing the bulk of the wealth of the very wealthiest in society.

In ongoing work, Guvenen et al. (2017) analyze wealth taxes in a model where individuals have different returns to their investment. They propose that there could be welfare gains associated with shifting from capital income taxation to wealth taxation. The argument is that when only capital income is being taxed, the burden of taxation falls disproportionately on high skilled investors, whereas passive and less successful investors avoid taxation. An interesting conflict therefore arises between redistribution (those who generate high returns have a high earnings ability) and efficiency (taxing capital income can lead to reduced investment among high skill investors). This presumes that excess returns are created by productive activities and not luck or circumstance.

2.8.2 Taxation of capital gains

Personal capital income refers to the return on a person's capital stock, which includes interest income, dividends, realized and unrealized capital gains. In similarity to wealth taxation, the taxation of capital gains represents a serious challenge for the tax system. In contrast to the taxation of capital income in the form of dividends or interest income, the problem with the taxation of capital gains is that they should ideally be taxed when they occur, but are in most countries taxed only when they are realized in a market transaction. This gives rise to a lock-in effect where individuals hold on to their assets in order to not trigger a tax payment. This lock-in effect can be mitigated by taxing assets continuously by computing an imputed rate of return on the asset. One solution is discussed by Auerbach (1991) who proposed to tax capital gains upon realization, but charging an interest on past gains when realization finally occurs, effectively eliminating the incentives to postpone realization. In the case of capital gains pertaining to housing, an annual property tax based on assessed market values can be used to continuously tax latent capital gains, thereby reducing the need to tax everything upon realization and avoiding some of the lock-in effect. We discuss property taxation in more detail below.

2.8.3 Taxation of property

A specific type of investment is land and buildings. "Property taxation" or "real estate taxation" is an annual tax on real property where the tax base may be land or buildings, or some combination of the two. The tax is usually based on an assessment of the market value of the property.

An investment in property is similar to an investment in a business asset. In the case of housing, the owner receives a return either in the form of an income stream obtained by renting out the house or a consumption stream obtained by using it as a personal accommodation. In the former case, the income accruing to the proprietor is observable, and can be directly taxed. In the latter case, the tax authority

needs to make an estimate of the value of the consumption the investment generates to its owner, which is referred to as the “imputed rent”. A common feature in many countries is that housing is subsidized in many ways. Poterba (1992) discusses these issues in the US and calculates the net-of-tax income from owning a house, considering it a business asset generating real economic profits, and discusses how these profits should be taxed in order to avoid efficiency costs associated with the subsidization of housing (see also Poterba and Sinai 2008). Gervais (2002) quantifies the welfare losses associated with the preferential tax treatment of housing in the US using a calibrated life-cycle model. He finds that individuals at all income levels would gain by the proper taxation of imputed rents and a restriction of the deductibility of mortgage interest.

The theory of optimal nonlinear income and commodity taxation can be used to assess the role the taxation of housing in an optimal tax system. According to the Atkinson-Stiglitz theorem, the imputed rent should be taxed in the same way as all other consumption goods, unless there is a good reason not to.³⁸ One such good reason could be if high skill individuals reduce their labor supply in order to perform home improvements that raise the value of the house. In this case, housing taxation becomes an indirect way of taxing leisure, increasing the attractiveness of work, which could mitigate the distortionary costs associated with progressive income taxation. Another reason why one would like to deviate from taxing properties in accordance with other goods would of course be if there are externalities. Some have argued that there are positive externalities if people take good care of their houses, as it provides a benefit to other people, and may result in better neighborhoods. Others argue that marginal quality improvements in housing produce negative externalities if individuals compare their housing consumption with others (that is, status-effects or envy, see Alpizar, Carlsson and Johansson-Stenman 2005, and Aronsson and Mannberg 2015).³⁹

In the context of property taxation, it is worth noticing that if the value of a house mainly reflects the value of the land upon which it was built, and the land value reflects economic rents, then additional taxation of housing beyond that to achieve uniformity with respect to other goods is warranted.⁴⁰ Finally, it is also important to distinguish between properties such as housing, and commercial properties

³⁸ The analysis of AS is not directly applicable to housing taxation as it neglects the durable aspect of housing consumption, which suggests that a dynamic framework is needed to analyze it. Koehne (2018) develops a dynamic framework of optimal commodity taxation where some goods are durable. In an application to housing, he finds that housing investment should be taxed at a higher rate than nondurable consumption.

³⁹ A large literature has found that consumption goods are not only valued based on their absolute qualities, but to a large extent how they compare to the consumption of others. Alpizar et al. (2005) found that housing is consumption good where such ‘relative consumption concerns’ are the strongest. For instance, it is likely that a person could achieve a higher utility living in an expensive house in an area where the average price of housing is low, as compared to living in an equally expensive house in an area where the average price of housing is high (*ceteris paribus*).

⁴⁰ Land is immobile and is the canonical example of a tax base for which price appreciation is independent of personal effort and almost exclusively determined by demand and supply. For example, a new public transport facility that reduces commuting time in a certain area will result in higher land prices in that area. Still, this

that are used as inputs in production. To avoid distorting production choices, commercial properties should be taxed in the same way as other inputs in production.

The correlation between individuals' capital ownership and their ability to generate income is one motivation for property taxation. The strong concentration of real estate capital in the upper part of the income distribution could be a particular motivation for a progressive property tax. Another factor that could motivate a more progressive tax on real estate would be if wealth directly enters individuals' utility functions, as real estate wealth constitutes the bulk of total wealth for most households.⁴¹

In the public debate, the property tax is a recurrent theme. Economists embrace it because it is efficient, while the public usually are less positive. In the US, so-called "property tax revolts" have erupted recurrently since the 1970s, often associated with middle-class homeowners protesting against the tax and many times successfully convincing policymakers to amend policies (Martin 2008).

Saliency is another potential determinant of the support for property taxation.⁴² Individual homeowners themselves often have the responsibility to pay the tax to the tax authority, in contrast to other taxes, such as income taxes, which often are withheld at source, and therefore less visible to taxpayers. Cabral and Hoxby (2012) study the relationship between saliency and the level of property taxation in the US by comparing US states where the degree of saliency varies as a function of technical features of the tax collection. They find that the saliency of the property tax could be one important factor explaining why it is so unpopular.

Liquidity problems are another possible explanation for the low popularity of property taxation, but one that has received less attention in the academic literature. There are practical tools that can deal with such issues. A *limitation rule* can mitigate the tax burden for people with low income (introducing, however, adverse labor supply incentives in certain income ranges). A *dampening rule* can be used to smooth tax payments in periods with soaring real estate prices.

3. Distribution of wealth and capital income

Two particular recent empirical developments in the Western world place emphasis on the role that capital taxation can play in advanced economies. One is that the stock of capital has increased in aggregate importance. Recent empirical studies show that private wealth as share of national income has gone from being approximately 300 percent (three years of national income) in the 1980s to a level of around

capitalization effect also goes for the buildings on the land, and therefore one usually taxes not only the land, but the entire real estate.

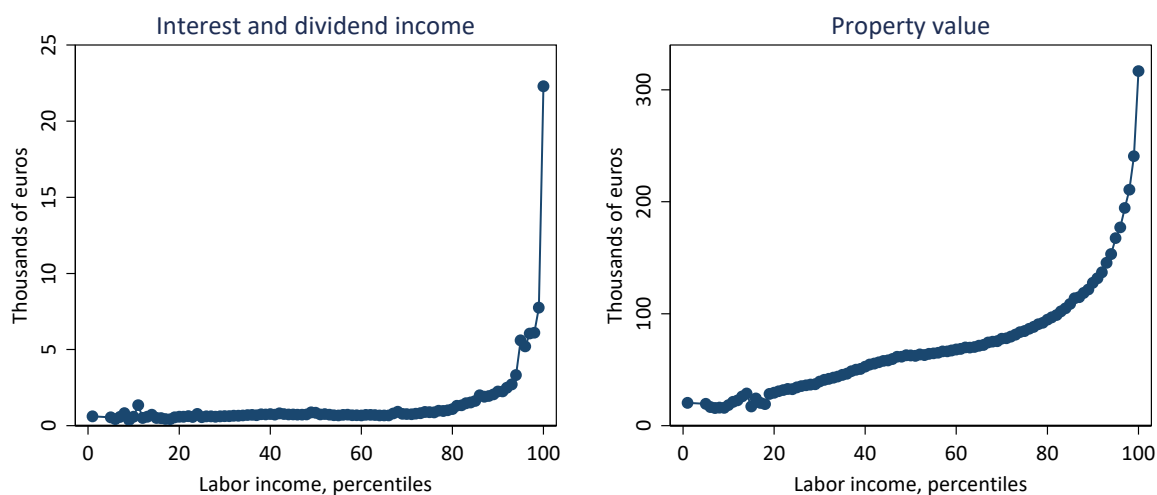
⁴¹ Progressive property taxes exist in several countries, for example, Denmark, Finland, France, Germany and Norway. Progressivity can appear in different forms. There can be a progressive tax schedule, or a basic deduction in combination with a proportional tax rate.

⁴² For contributions emphasizing the importance of tax saliency, see Chetty, Looney and Kroft (2009) and Finkelstein (2009).

600 percent today.⁴³ The other is the secular increase in income inequality in most Western countries since the 1980s, which has been to a considerable extent due to a growth in capital income, especially among top-income earners.⁴⁴ While being relatively uncontroversial on the whole, one should notice that there is a fair amount of cross-country variation in the order of magnitude and compositional structure of these developments.

In our theoretical analysis above, we discussed that one important distributional aspect of capital is the relationship between capital income (and capital ownership in general) and earnings ability. However, relatively little is known about this relationship. A study of US households by Gordon and Kopczuk (2014) shows that both high labor income and large personal wealth indeed correlates with wage rates, which can be seen as proxies for earnings abilities. In Figure 1, we study the Swedish case by showing the correlation between labor income and two proxies of capital ownership for the adult population during the period 2012–2013. A first notable fact is the relatively low capital income for the majority of the population, which partially reflects low market rates during our examination period, but also a low level of financial saving among Swedish households in general. House ownership appears to be more broadly distributed in the population, yet it is monotonically increasing in the earnings distribution. In both cases, there is a sharp increase in the level of capital income and property values in the top of the earnings distribution.

Figure 1: Correlation between capital and labor income



Notes: Adults (20+) ranked according to the taxable labor income. All incomes and property values are averaged over the years 2012–2013. Properties do not include tenant-owned apartments. *Source:* Swedish income and property tax registers, Statistics Sweden.

⁴³ See, for example, Piketty and Zucman (2014, 2015) and for Sweden also Waldenström (2016, 2017). Note that we define capital as the sum of asset values less the value of liabilities, and thereby use the terms capital and wealth interchangeably.

⁴⁴ See, for example, Atkinson, Piketty and Saez (2011) and Roine and Waldenström (2015).

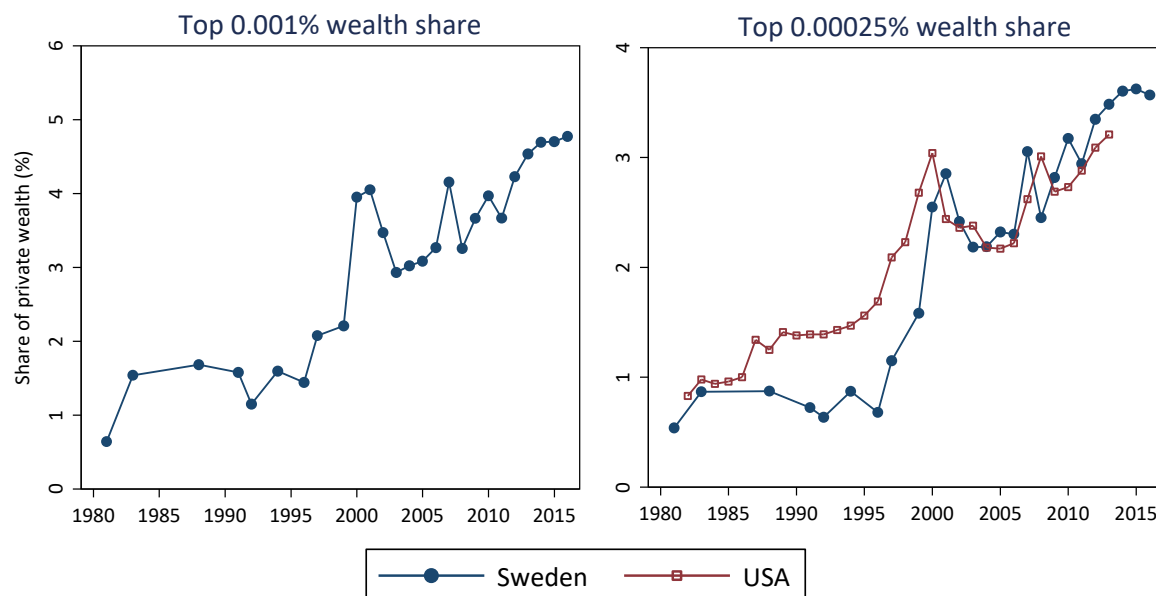
A salient distributional aspect of capital is the inequality in personal wealth. The scarcity of individual wealth data that includes all wealth categories and covers long time periods prevents a comprehensive analysis of the wealth distribution and its development over time. When looking at the most recent evidence from different Western countries, comparability between countries is hampered by a use of different sources and methods, but taken at face value, there does not seem to have been any large increases in wealth inequality in developed economies during the last years. The US is a potential outlier with an upward trend in several data series, even though the exact magnitude and timing of the increases is discussed. Saez and Zucman (2016) present evidence using capitalized income tax data that suggests dramatic increases in wealth inequality, in particular since 1990. When instead using US estate tax returns transformed into portraying the wealth distribution of the living population, no such increase is recorded (Kopczuk and Saez 2004). The household data in the Survey of Consumer Finances that are collected since decades indicate an increase, but it is much smaller than the one suggested by Saez and Zucman as discussed by Kopczuk (2015) and Bricker et al. (2015). Looking at European countries, the UK wealth distribution estimated by Alvaredo, Atkinson and Morelli (forthcoming), using estate tax returns, does not indicate any increased wealth inequality since the 1970s. Studies of the Nordic countries that use administrative register databases offer perhaps the best currently available wealth data. Jakobsen et al. (2018) estimate wealth inequality in Denmark and find no trend in top wealth shares since the 1980s. Lundberg and Waldenström (forthcoming) find a similar result in a study of the Swedish wealth distribution using a combination of observed wealth stocks and capitalized taxable capital income.

A different way to assess wealth inequality is to focus on the wealth concentration in the extreme top of the distribution. Several countries have journalistically generated “rich lists” that cover the richest known individuals or families (widely defined), and well-known examples of such lists are Forbes 400 for the US, “Manager Magazin” for Germany, “Challenge for France” and the “Sunday Times Rich List” for the UK. Since 1981, Swedish business magazines have published lists of the wealthiest Swedes. The Swedish list contained 26 individual fortunes in 1981 and in 2016 it contained 178 individuals having a personal wealth worth more than 1 billion SEK (about 100,000 million euros). Focusing on such an exclusive group in society may seem extreme, not to mention the coarse methods underlying the creation of this data.⁴⁵ However, the amount of wealth controlled by this group is enormous: the 154 Swedish billionaire families living in Sweden in 2016 owned SEK 1,136 billion, which is equivalent to 6.5 percent of the total private net wealth in the country, or roughly equal to the net worth of central government (1,176 billion SEK). If one also includes 38 Swedish billionaire families living

⁴⁵ The credibility of the material depends on the quality of the underlying journalistic effort. Estimating the resources of wealthy families is complex. The largest sources of error exist in the valuation of non-listed business equity and debt and the difficulties involved in obtaining a complete account of all assets.

abroad, the total fortune of this exclusive group becomes SEK 2 220 billion, or 13 per cent of the wealth of all Swedish households.

Figure 2. The wealth share of super-rich: Sweden and the US, 1981–2016.



Source: Sweden: Own compilations of Affärsvärlden, Veckans Affärer. USA: Saez and Zucman (2016).

Figure 2 shows the evolution of wealth shares of the super-rich over the past 35 years. The left panel shows the share of the richest 0.001 percent, around 40 super rich Swedish families. The share has increased markedly over time, from 1 percent in the early 1980s, to 6 percent in 2016. The lumpiness of the curve is partly due to measurement differences across years, but partly also due to real economic changes. For example, the Swedish economic crisis in 1991–1993 appears in the form of a fall in 1992. The 1999–2000 financial bubble, the 2008 financial crisis and the recoil thereafter are also clearly visible.

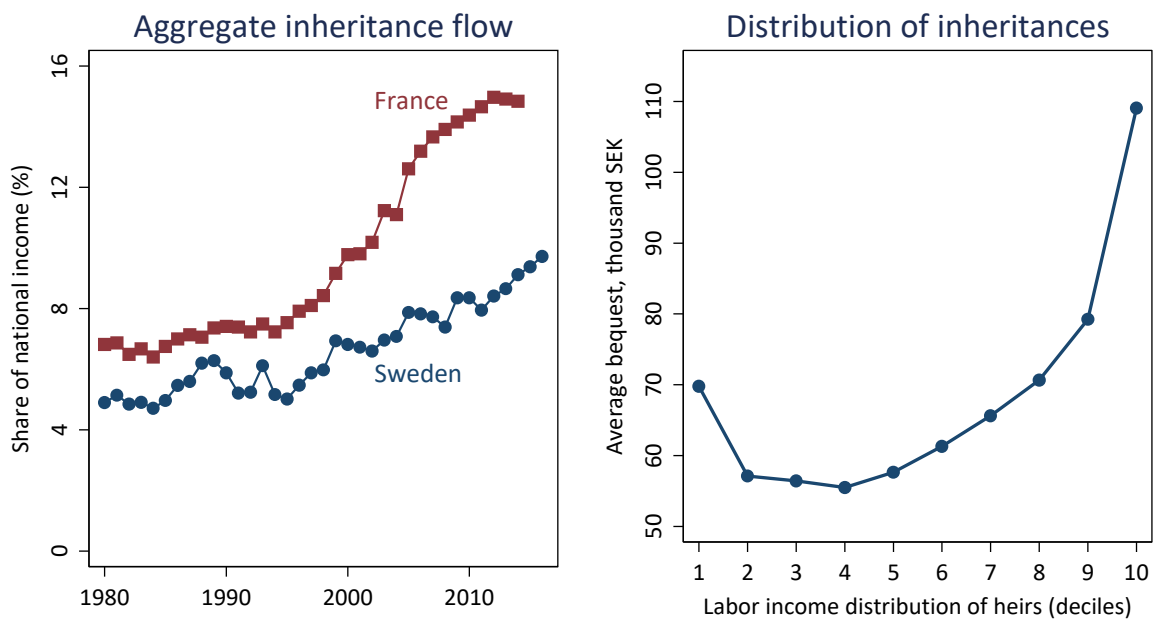
Is this level and trend in wealth concentration among the super-rich unique for Sweden? Similar evidence does not exist for many other countries, but an exception is a compilation by Saez and Zucman (2016) of the data in the Forbes 400 where the data collection began in 1983, one year after the Swedish list was initiated. The right panel of Figure 2 shows the development of the wealth share of the super-rich in Sweden and in the United States, now depicting the share of the largest possible group for both countries, the richest 0.00025 percent (about 250 families in the U.S. and 10 families in Sweden). The results show that both the level and the rate of increase are astonishingly similar in the two countries.

Yet another way to study the distributional consequences of capital is by examining their impact on intergenerational mobility of income and wealth. In a study of generational income links in Sweden, Björklund, Roine and Waldenström (2012) find that the correlation between father and son incomes

become stronger when capital income is included in the income concept. Another study of Swedish data by Adermon, Lindahl and Waldenström (2018) looks at intergenerational wealth mobility and its determinants. Their most important finding is that a large part, perhaps half, of the measured mobility can be attributed to inheritance and gifts, which are observed through linked inheritance tax returns.⁴⁶

Inheritance is a direct channel through which capital can influence intergenerational mobility, as well as the overall inequality of opportunity in society. Looking first at the aggregate, macroeconomic, picture, estimates of the annual flow of inheritance and lifetime gifts indicate a share of national income of between 5 and 15 percent. Figure 3's left panel shows this share for France and Sweden since 1980, drawing upon recent estimates by Piketty (2011) for France and by Ohlsson, Roine and Waldenström (2014) for Sweden. In both countries, the importance of inheritance clearly trends upwards over this period. A very substantial share of actual wealth is in fact inherited. In Sweden, the share of wealth that is inherited amounts to almost 50 percent (Ohlsson, Roine and Waldenström 2014), and the share varies between 30 and 60 percent in Western countries (Wolff 2015; Piketty and Zucman 2015).

Figure 3: The role of inherited wealth: aggregate flow and distributional effects



Source: Inheritance flows are defined as aggregate flow of inherited wealth including *inter vivos* gifts divided by national income. For Sweden, data come from Ohlsson, Roine and Waldenström (2014) and for France from Piketty (2011, with updates). Distribution of inheritances from the Swedish inheritance tax register, average over the years 2002–2004 (for data description, see Elinder, Erixson and Waldenström 2018).

⁴⁶ This finding is in line with a study by Boserup, Kopczuk and Kreiner (2018) who documents that intergenerational wealth correlations are higher for Danish children and young adults with deceased parents or grandparents.

Turning to examine the distributional patterns, Figure 3's right panel shows that the average bequest size increases in the pre-inheritance income of heirs, which indicates a strong, positive correlation between inheritances and the abilities of heirs, a correlation that appears to be especially marked in the top of the distribution. Thus, those who inherit the most appear to be those who have high earnings capacity, suggesting that inheritance taxation can serve an important redistributive role.

4. Behavioral responses to capital taxation

This section analyzes the behavioral effects of capital taxation. First, we briefly outline the current practice of capital taxation in the developed world. Thereafter, we present and discuss the existing empirical evidence on behavioral responses to different capital taxes.

4.1 Capital taxation in practice: An international comparison

Capital taxes take many different forms, as we discussed in previous sections. If one wishes to assess their relative importance in the economy and compare them across countries, one tractable way is to relate their respective revenue shares as a percentage of GDP. Figure 4 presents such a cross-country comparison for a selection of OECD countries. To place things into perspective, we highlight four different representations: Panel (a) shows the overall tax-to-GDP ratio, panel (b) the capital tax-to-GDP ratio, panel (c) the so-called "wealth-based" capital tax-to-GDP ratio, and panel (d) the percentage point change in the wealth-based capital tax ratios over the past 15 years.

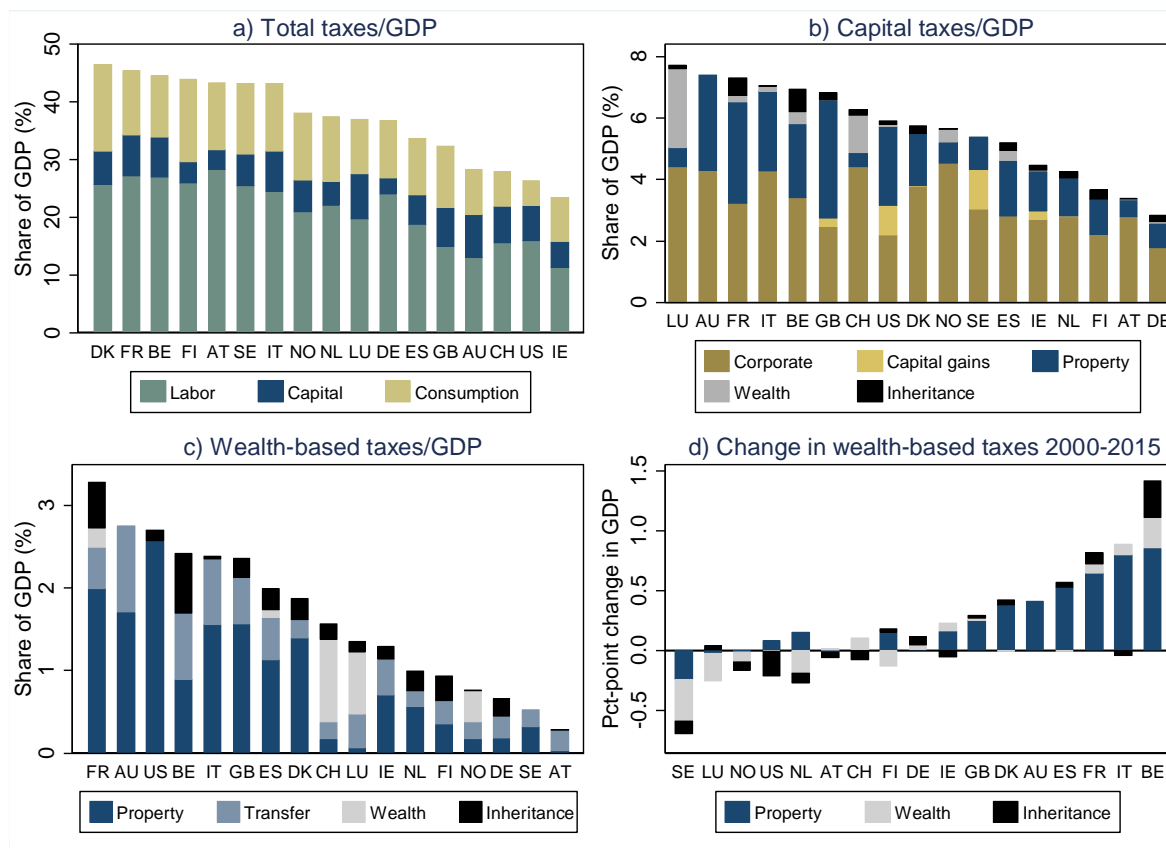
One stylized fact that emerges from the figure is that in all rich countries, direct labor taxes constitute the largest source of tax revenues, followed by indirect consumption taxes. Capital taxes represent a minor share, only about one tenth of all tax revenues, and this does not vary much between countries. The relatively limited fiscal importance of capital taxes is expected; in fact, it is in line with macroeconomic fundamentals concerning the size of the capital stock, real wealth returns and capital tax rates. To see this, assume a private wealth-to-GDP ratio of 450 percent (the ratio ranges between 300 and 600 percent in developed economies), a real rate of return of three percent and a capital income tax of 30 percent. The effective capital tax revenue would then be about four percent of GDP, which is in line with Figure 4.⁴⁷

Looking at the composition of capital tax revenues, panel (b) shows that the corporate tax is the most important, representing roughly half of total capital tax revenues in most countries. Property taxes, including both recurrent and transfer taxes, are also relatively important. Panels (c) and (d) highlight

⁴⁷ That is, $450\% \times 3\% \times 30\% = 4.05\%$. An alternative calculation departs from the net capital share of national income at around 20 percent (it ranges between 10 and 30 percent in rich countries) and a capital income tax of 30 percent. This would result in a capital tax revenue of 6 percent ($20\% \times 30\% = 6\%$) of GDP.

wealth-based capital taxes: property taxes (recurrent and/or on transfers), net wealth taxes and inheritance/gift taxes. These taxes play the most significant role in larger countries such as France, the US, Italy, Great Britain and Spain, and in two smaller countries, Belgium and Denmark, with revenues around 2–3 percent of GDP. In the other OECD countries, they matter much less and are around one percent of GDP. Wealth taxes, defined as taxes on household non-financial and net financial wealth, were commonplace until the 1990s and 2000s when most countries decided to dismantle them. Today, only Spain and Luxembourg (and to some extent France and the Netherlands) in the EU, and Norway and Switzerland outside the EU have them. Inheritance taxation has also become less commonplace in recent decades, but it is still used in a dozen OECD countries, either as an inheritance tax (applying to the transfers received by heirs) or as an estate tax (applying to the wealth of the deceased). In most countries, the inheritance taxes affect transfers above 100-200 thousand euros and marginal tax rates range between 20 and 50 percent (Henrekson and Waldenström 2016).

Figure 4: Tax revenues in OECD countries (percent of GDP).



Note and source: Data from 2015, OECD tax revenue statistics.

The rate of change in wealth-based taxes since 2000 in the OECD countries is shown in panel d of Figure 4. As is clear, there is a quite large variation across countries, with Sweden standing out as the only country where these taxes have decreased significantly in importance. The main explanation for

the Swedish decrease was an exceptionally large cut in property taxation in the late 2000s, which, together with the abolishment taxes on wealth and inheritance, contributed to the fourfold increase in house prices over this period. In almost all other OECD countries, property taxes have grown in importance, most notably in France, Britain, Belgium and Spain.

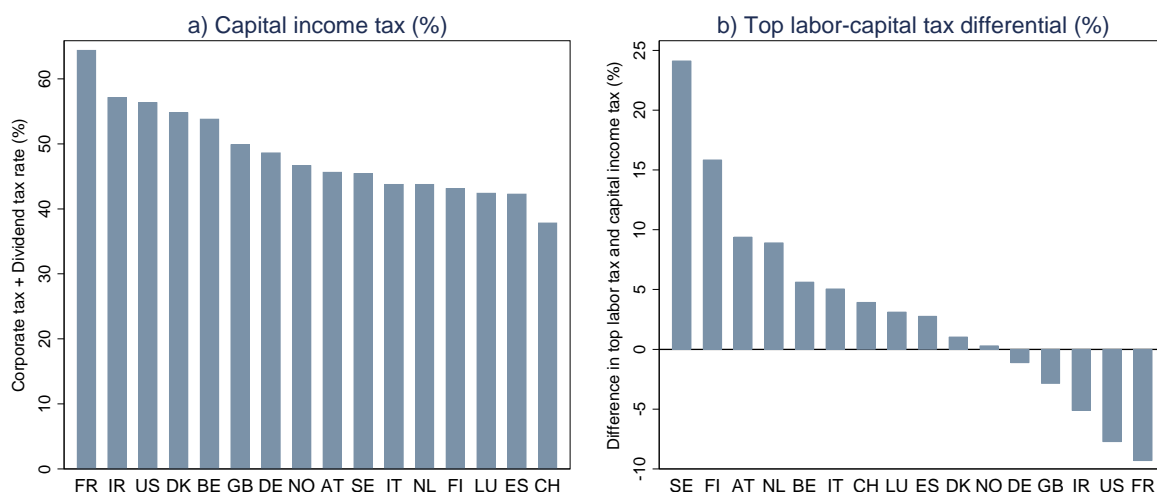
A specific feature of capital taxation concerns its balance vis-à-vis labor taxation. In our theoretical analysis above, we discussed this question in the context of “dual” income taxation in the Nordic countries. Dual taxation means that capital income is taxed separately from labor income, and this practice has been used (in slightly different variants) in the four Nordic countries for about 30 years.⁴⁸ One of the key principles in the dual tax system is the uniformity, or “neutrality”, of the capital income tax. The original idea was that a uniform proportional tax rate (at around 30 percent) would apply to all asset types and holding periods, allowing deductions for capital losses and capital expenses, thereby minimizing incentives for tax planning, tax arbitrage and other distortionary activities. However, the uniformity turned out to be difficult to uphold due to political pressures from special interest groups to implement tax changes catered to specific groups in society. In Sweden, for example, differentiated tax rates and changes in the method used to calculate taxable returns implies that the effective tax rate can differ across types of capital incomes.⁴⁹ Policymakers have motivated the departure from uniformity in different ways, mainly by pointing to the need for special exemptions to promote business activity among small and middle-sized firms.

An international comparison of the balance between labor and capital income taxation is difficult to make because of deductions and differential tax treatments depending on the holding period etc. Figure 5 is an attempt to make such a comparison, showing capital income tax rates (dividend income tax + corporate income tax) in panel (a) and the difference between top marginal labor income tax rates (including the tax component in social security contributions and payroll taxes) and the capital income tax rate in panel (a). While the variation in capital income tax rates is modest, the level in most countries is between 40 and 50 percent. The differential between labor and capital income tax rates varies more notably. The highest tax gap is found in Sweden and Finland at 25 and 15 percent. Both these countries tax capital incomes at a level close to the OECD average, which means that the large gap can be explained by the high taxation of labor income. Notice that this differential is not an artefact of the dual income tax system; Denmark and Norway have almost no tax difference at all. At the bottom of the scale, we find France, the US and Ireland, with negative tax differentials of around –5 to –10 percent.

⁴⁸ Denmark was the first to introduce the dual tax system in 1987. Thereafter, Sweden did it in 1991, Norway in 1992 and, finally, Finland in 1993.

⁴⁹ Specifically, dividends and capital gains are taxed at different rates depending on whether the companies are listed on the stock exchange or not. Some investments in special “investment accounts” are taxed based their imputed, rather than actual, return, making them more like a tax on the stock of financial wealth.

Figure 5: Total maximum marginal tax on dividends from listed companies.



Note: OECD Tax Database, table “Statutory corporate income tax rate”. The capital income tax τ_K in panel (a) is computed to include the corporate tax τ_C and the dividend tax τ_D as $\tau_K = 1 - (1 - \tau_C)(1 - \tau_D)$.

4.2 Behavioral responses to wealth taxes

There is not much empirical research on the efficiency cost of wealth taxes. The main reason is the lack of adequate data and credible identification strategies. Housing wealth constitutes the bulk of most household portfolios, and it is almost entirely insensitive to wealth taxation (apart from capitalization effects). Entrepreneurial activity and business wealth is perhaps what economists are mostly interested in but is imperfectly covered in most wealth databases and sometimes not even part of the tax base.

Most empirical studies examining behavioral responses to the wealth tax analyze taxable wealth rather than the economically more relevant total marketable, market-valued wealth. In other words, these studies capture how owners adjust their investments according to how they are taxed (reporting effects) rather than the allocation of real physical investment (see Brühlhart et al. 2017 and Seim 2017 for two recent contributions). Jakobsen et al. (2018) is a recent attempt to identify the real effects of wealth taxation by analyzing behavioral responses to the Danish wealth tax that existed until 1997. Using a rich administrative register dataset, they find that the behavioral effects of the wealth tax on wealth accumulation were small in general, but large among very wealthy households. The order of magnitude of the estimated effects indicate fairly notable efficiency costs of the wealth tax, although the estimates should be interpreted with some caution due to the uncertainties in the historical data series.

4.3 Behavioral responses to inheritance taxation

To empirically analyze the economic consequences of inheritance taxation is difficult and there are few studies available. One of the major challenge is to distinguish actual capital accumulation effects from tax planning (reporting effects). In a survey of the literature, Kopczuk (2013) concludes that the effects of inheritance taxation on taxable inheritance appear to be relatively small. Goupille-Lebret and Infante

(2017) examine changes in the French inheritance taxation and effects on private savings in life insurance funds. Using discontinuities in the tax code with respect to time and age, the authors make an attempt to disentangle real accumulation effects from avoidance responses and find modest effects on real capital accumulation. Kopczuk (2007) made an influential study of estate tax planning in the US, exploiting the receipt of news about terminal illness. The results show that the estates of individuals who received the news substantially decreased in value, primarily due to tax planning.

Estimating the consequences of inheritance taxation on economic efficiency is difficult, both because adequate longitudinal data sources are usually lacking and also because identifying the effects empirically is challenging. One of the major empirical challenges is to distinguish actual capital accumulation effects from tax planning (reporting effects). In a survey of the literature, Kopczuk (2013) concludes that there seem to be relatively small effects of inheritance taxation on the taxable inheritance. Goupille-Lebret and Infante (2017) examine changes in the French inheritance taxation and the effects on private savings in life insurance funds. Using discontinuities in the tax schedule with respect to time and age, the authors disentangle real accumulation effects from avoidance responses. However, the real accumulation responses are found to be small. Kopczuk (2007) made an influential study of estate tax planning in the US, exploiting the receipt of news about terminal illness. The results show that the estates of individuals who received the news substantially decreased in value, primarily due to tax planning.

Another strand of the literature has studied if there are any more general efficiency considerations of inheriting wealth in the context of entrepreneurial activities and family-firm successions. In an unpublished study of Swedish administrative register data on inheritances and firm performance, Escobar (2017) finds that firms whose owners inherit significant amounts tend to survive longer than other, comparable firms do. However, this survival does not seem to be driven by higher productivity, measured as firm profits or owners' incomes, but instead by enabling small business owners of lower ability to subsist. A similar conclusion regarding the effects of inheritance on entrepreneurial performance was presented by Bennedsen et al. (2007) based on a large Danish micro dataset of family firms, which contains information on whether or not the main owner has deceased. An instrumental variable approach is used exploiting the sex of the first-born child as instrument for whether the firm is taken over by the first-born son in the family or by an external professional CEO. The main result is that there is a large, negative impact of sons inheriting the firm leadership on the firm's subsequent performance. These studies suggest that inheritances in some cases can be harmful for economic efficiency.

4.4 Tax-driven reallocation of investment

Capital taxes influence net-of-tax returns on savings and investments, and if these taxes differ across capital investments, they will also affect the allocation of savings and investments. A large literature

has studied the role of taxes for household portfolios and found large and persistent effects.⁵⁰ For example, Agell and Edin (1990) showed how increases in the tax on bank interest income led to an increase in the share of stock investments among Swedish households. At the same time, Rydqvist, Spizman and Strebulaev (2014) show how postwar dividend tax policies have been pivotal to explain the decline in individual direct stock ownership while stock holdings of financial institutions have surged, especially within the context of pension plans.

5. International capital mobility, hidden wealth and information exchange

In a closed economy, the efficiency costs of capital taxation relate to how individuals change their intertemporal consumption patterns and how capital taxation discourages productive domestic investments and growth. In an open economy, additional efficiency costs arise to the extent that individuals can migrate and/or move their wealth abroad.

Most countries' tax systems abide by the so-called residence principle, which means that individuals are liable to pay taxes on all their incomes, independently of where these incomes have been earned. An important determinant of the economic costs of capital taxation is the possibilities for individuals to engage in tax evasion and tax planning, thereby avoiding taxation in their home country. As there is a clear upward trend in terms of information exchange agreements between countries, the possibilities to avoid taxation in the home country are diminishing. This increases the capacity of small open economies to tax capital. If all tax planning and tax avoidance possibilities disappear, the only way for an individual to avoid taxation in the home country is to migrate.

5.1 Capital flight and hidden wealth in tax havens

Tax-driven capital flight and the stock of hidden wealth in offshore tax havens have been studied intensively in recent years, but due to the scarcity and complex nature of data, it has been difficult to draw strong conclusions about the role of capital taxation for international capital mobility and tax evasion. What stands absolutely clear, however, is that the amount evaded is enormous. Zucman (2013) attempted to estimate the extent of hidden offshore wealth globally using an ingenious approach based on netting out financial assets and liabilities in national balance sheets with the purpose of identifying unexplained gaps. His finding was that approximately USD 6 trillion, or 8 percent of global wealth, was placed in tax havens in 2007. Annual tax losses due to tax evasion are also significant, estimated to range between 300 and 1000 billion globally, of which the majority of these are concentrated to OECD countries (Crivelli, De Mooij and Keen 2016).

⁵⁰ For overviews, see Poterba (2002) and Campbell (2006).

Country-level evidence can offer important hints to the channels through which taxes and monitoring efforts affect tax-driven capital mobility. Statistics from the Swiss tax authorities presented in Johannesen (2014) support the existence of extensive tax evasion; 80 per cent of all wealth that Europeans placed in Switzerland is not reported in their respective countries, which strongly suggests avoidance of domestic taxes. The evolution of tax evasion and hidden offshore wealth over time can indicate the importance of past tax changes. Alstadsæter, Johannesen and Zucman (2018) show that the phenomenon of hiding wealth in offshore tax havens is old, dating back to the early postwar period but that its relative importance has grown over time. Roine and Waldenström (2009) examine the case of Sweden and estimate a notable increase in offshore wealth following the country's liberalization of the capital account in 1989, which removed most formal restrictions on cross-border flows.

The distributional consequences of this tax evasion have been studied recently by Alstadsæter, Johannesen and Zucman (2017) using newly released leaked documents of named tax evaders. These documents originate from the renowned "Swiss leaks" and "Panama papers", which contain lists of private individuals from Europe and the US holding assets in tax havens. The researchers use information about names and addresses to locate thousands of Scandinavian individuals in these documents and then link them to administrative tax registers in Denmark, Norway and Sweden. Using this evidence, they document that these individuals appear to be relatively wealthy; about 80 percent of them belong to the top 0.01 percentile of their countries' wealth distribution. While this shows that domestic wealth inequality is larger than what the official estimates show, it also suggests that tax evasion could be widespread and that these wealthy individuals evade approximately one third of their personal taxes.

Avoiding domestic capital taxes through individual migration represents a high-cost tax-avoidance strategy. While the documented capital migration to some extent reflects the emigration of individual business owners, some recent studies examine tax-induced mobility also among different high-income groups, for example professional football players (Kleven, Landais and Saez 2013), high-income earners in Denmark (Kleven, Landais and Saez 2014), and scientists and innovators (Akcigit, Baslandze och Stantcheva 2016, Moretti and Wilson 2015). The results from these studies are relatively consistent in that relative top marginal income taxes seem to be correlated with migration patterns among high-ability individuals.

5.2 Information exchange agreements

Increased transparency and greater information exchange between countries could counter the problems of tax evasion and the tax-driven capital flight to tax havens. In recent years, there has been a rapid and intensive development to install infrastructures for information exchange between countries, initiated and directed by cross-national organizations such as OECD, G20 and EU, but bilateral initiatives also

exist. These efforts largely consist of introducing reporting standards and automated information exchange arrangements, aimed at curbing tax evasion and tax planning.⁵¹

The impact of these information exchange agreements is still under scrutiny, but an increasing number of studies suggest that they have significantly reduced tax evasion. OECD (2017) estimates that over 500,000 taxpayers have disclosed assets over the past eight years, resulting in an increase of over 85 billion euros in tax revenues. For Sweden, 9,800 Swedes had recovered about 1.8 billion kronor by March 2016 through self-corrections.

Some research studies have found evidence of capital flowing back from tax havens as a result of the information treaties, and particularly those that are signed at the multilateral level. Johannesen and Zucman (2014) study the effect of bilateral treaties regarding the reporting of banking transactions. Their main finding is that tax evaders seem sensitive to the risk of exposure, but instead of repatriating, shifted their funds to tax havens that were not covered by the treaties. Slemrod et al. (2017) analyze how a series of US initiatives have affected tax evasion of US citizens presumably hiding assets around the world. Although results are preliminary, individuals reporting foreign assets increased by 20 percent, but the largest effect came from voluntary compliance outside the control initiatives.

The effectiveness of information exchange agreements relies ultimately on the number of participating countries. The finding by Johannesen and Zucman (2014) of tax evaders moving to tax havens outside the treaties, underscores this issue. Elsayyad and Konrad (2012) highlight the importance of signing multilateral agreements in order to minimize the risk of a single non-participating tax haven reaping all the hidden wealth. A related problem is how to sanction non-complying countries.

6. Concluding discussion

For decades, economists have relied on canonical optimal tax models that do a poor job explaining inequality in wealth and capital income. Studies from the 1970s and 1980s almost closed the case on capital taxation by showing convincingly that they had a minor role to play in an optimal tax system. In recent years, however, scholars are increasingly bringing in capital taxation from the cold and have questioned many of the conventional wisdoms. Taxes on capital are today increasingly regarded as potentially both efficient and equitable parts of fiscal policy.

We have analyzed the theoretical literature on optimal taxation to learn about the desirability of taxing individual wealth and capital income as well as empirically examined the distributional role of wealth and capital income, and assessed the distortionary costs of capital taxation. Our overall message is that there are good arguments to tax capital. Taxation of capital income can be motivated on both equity and

⁵¹ Among these initiatives are OECD's Base Erosion and Profit Shifting (BEPS), EU's Anti-Tax Avoidance Package (ATAP) and the US's Foreign Account Tax Compliance Act (FATCA).

efficiency grounds. Most importantly, as individuals with higher incomes (or more precisely, higher earnings capacity) often are those who have high capital income or have inherited wealth, capital income taxation becomes an efficient complement to progressive labor income taxation. Tax rates on labor and capital income are likely to be different as these tax bases are related in different ways to the welfare of individuals and differ in their responsiveness to taxation.

While, in principle, progressive capital taxation could be desirable on equity grounds, we deem the administrative problems relating to tax avoidance and tax arbitrage to be too great. The Nordic ‘dual’ income tax, which taxes labor income according to a nonlinear progressive tax schedule and capital income according to a proportional rate, could therefore be a constructive way to strike a balance between an optimal and administratively feasible tax system. Even though the dual income tax employs a proportional tax on capital income, and therefore does not reap the potential equity gains of adopting a progressive capital income tax, it is possible to increase the overall progressivity of the tax system by complementing capital income taxes with taxes on property, wealth and inheritance.

Empirical evidence suggests that capital income is more responsive to taxation than labor income, which suggests that the capital income tax rate should be lower than the tax rate on labor income. However, care must be taken so that the divergence is not too large to prevent cross-base income shifting. Further research is needed to quantify the welfare gains of different ways of taxing capital. A quantitative comparison of the relative gains of adopting fully nonlinear non-separable taxes on capital, comprehensive income tax systems, and dual income tax systems, allowing for realistic cross-base shifting is needed to gain further insights into this important policy issue.

Property should be taxed on both equity and efficiency grounds. In particular, the imputed income from owner-occupied housing should be taxed, both because housing provides consumption benefits and because it is an investment with the same properties as a business asset. Liquidity problems should be mitigated by relating property tax payments to household income and employing dampening rules to smooth the changes in tax burden from year to year. Capital gains on property should also be taxed, just like any other investment.

Inheritance should probably be taxed. We have discussed several efficiency effects of inheritance taxes, but they are notoriously difficult to quantify empirically. It is therefore hard to draw general conclusions about the social desirability of inheritance taxation. However, as inherited wealth does have substantial effects on the wealth distribution and affects the life chances of individuals, we still think a compelling case for inheritance taxation can be made.

An overall ambition should be to tax different investments as uniform as possible to avoid distortions in investment choices. Maintaining uniformity requires policymakers to withstand pressures from special interest groups as well as solve practical problems associated with the implementation of certain capital taxes (such as liquidity problems).

To place our theoretical analysis into perspective, we have presented a number of empirical results on the extent and distribution of capital. We note that there is a large divergence between countries in terms of the taxation of capital, especially in terms of the relative tax burden between labor and capital income, as well as in the use of wealth taxes. What is puzzling about these observations is that the divergences are observed among countries with comparable institutional characteristics and similar ambitions regarding income redistribution and desires to promote growth-enhancing business activity.

The balance between labor and capital taxation can probably be improved in several countries. It seems appropriate to be equally careful about the distortionary effects of labor income taxes on human capital investments as one should be about the distortionary effects of taxes on physical capital accumulation. Given the large reliance of progressive labor income taxation in many modern welfare states, particularly the Nordic countries, we think that a better balance between labor and capital taxation could be achieved by increasing the tax burden on capital.

There are certain angles and questions that we have not been able to cover. One of these is that governments can facilitate an egalitarian income and wealth distribution in other ways than through taxation, for example by providing individuals better incentives and opportunities to create wealth. Another question that we have only touched lightly upon is how automation of the workforce and the digitalization of services will affect the importance of capital and capital taxation. Some recent studies argue that automation has resulted in falling wage shares (see, for example, Autor et al. 2017). However, several Western countries have not experienced such declines, despite rising automation. Furthermore, the theoretical basis for understanding the role of capital taxation in light of these changes is still lacking, and we hope that these and related questions will attract considerable attention in the years to come. Finally, we have not analyzed the political economy of capital taxation. From a theory perspective, Scheuer and Wolitzky (2016) highlight the importance of political constraints by analyzing optimal capital taxation under the threat of a radical political reform that could entail a significant redistribution of wealth. From an empirical perspective, these questions have been analyzed by Alesina et al. (2018), Fisman et al. (2017), and Bastani and Waldenström (2018). These are very relevant and interesting topics that we also hope will generate much research in the future.

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