

Optimal Taxation in Practice: Lessons for the Swedish Tax System

En forskningsöversikt inom teoretisk normativ skatteforskning skriven av Sebastian Koehne, forskare vid Institutet för Internationell Ekonomi vid Stockholms universitet.

Riksrevisionen beställer löpande *forskningsöversikter* i syfte att öka kunskapen om vad forskningen säger inom vissa av de områden som Riksrevisionen planerar att granska.

Idag publicerar Riksrevisionen en översikt av forskningen om optimal beskattning med särskilt fokus på det svenska skattesystemet, skriven av Sebastian Koehne, forskare vid Institutet för Internationell Ekonomi vid Stockholms universitet.

Översikten är i huvudsak begränsad till den så kallade teoretiska normativa skatteforskningen. Denna forskningslitteratur ger vissa insikter om vad som karakteriserar ett bra utformat skattesystem med hänsyn tagen till både effektivitet och politiskt önskvärd fördelning. Den omfattar inte i detalj alla de skatter som finns i det svenska skattesystemet, utan framförallt skatt på arbetsinkomster, kapitalinkomster och konsumtion. Den omfattar inte heller den empiriska forskning som finns om skatters beteende- och fördelningseffekter. Denna del av forskningslitteraturen har också begränsningar när det gäller effekter av den ökade internationaliseringen, digitaliseringen och beskattningen av entreprenörer. Författaren förklarar noga vilka slutsatser som kan dras från denna forskning och vilka begränsningar den har.

Några andra faktorer som är viktiga för skattesystemets utformning och som också är viktiga utgångspunkter för Riksrevisionens granskningar inom skatteområdet är enkelhet, begriplighet, legitimitet och effektiv skatteindrivning.

Den publicerade översikten ska ses som ett viktigt men i vissa delar avgränsat bidrag till kunskapen om vilka faktorer som enligt forskningen är centrala för ett väl utformat skattesystem.

De slutsatser som dras i översikten är författarens egna och ska inte uppfattas som Riksrevisionens ståndpunkter i frågan.

Robert Boije, chefsekonom och chef för Effektivitetsrevisionen

Optimal Taxation in Practice: Lessons for the Swedish Tax System

*Sebastian Koehne (Institute for International Economic Studies,
Stockholm University)*

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Abstract

This report surveys the main academic findings about the optimal design of taxes. The general policy lessons are as follows.

Lesson 1: Given current empirical knowledge, optimal tax rates on labour incomes cannot be predicted with high precision.

Lesson 2: Except for health-promoting benefits (e.g., *friskvårdsbidrag*), there is no evidence against treating all types of labour incomes (wages, bonuses, other pecuniary benefits) symmetrically for tax purposes.

Lesson 3: There is no scientific consensus on the main determinants of capital income taxes, nor on the optimal magnitude of capital income taxation.

Lesson 4: There is no evidence against treating all types of capital incomes symmetrically for tax purposes. In particular, property taxes on real estate should match the tax burden on imputed rents if those rents were classified as capital incomes.

Lesson 5: Corporate income taxes should be low. Policy makers should pay attention to global trends in corporate taxation.

Lesson 6: A uniform VAT is advisable. Any remaining exceptions should be abolished and income taxes and transfers adjusted to compensate households for the higher tax burden.

Lesson 7: To correct for negative social effects, there should be taxes on environmentally harmful activities, alcohol and tobacco. (Possibly also on unhealthy foods and drinks.) Policy makers should seek up-to-date estimations of the external costs when setting the rates for these taxes.

Lesson 8: Household-related services, job-related expenses (travel, commuting, clothing, equipment, etc.) and human capital investments should be favoured by the tax system. In particular, *RUT* and *ROT* reductions are generally advisable.

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1. Introduction

Tax design is one of the most fundamental tasks of policy makers. It is also a core area of economic research. To provide information to the policy debate, this report surveys the most relevant academic contributions about the optimal design of taxes. The aim is to summarize the main findings without paying too much attention to technical details and formal equations. The report also discusses shortcomings and limitations of existing studies and points out some possible avenues for future research. Moreover, the report briefly sketches recent taxation trends in the OECD countries and current challenges for tax policy. Finally, the report draws some general policy lessons based on a comprehensive evaluation of the main findings.

The report overlaps with several other surveys of optimal taxation theory. In particular, there are many similarities to contributions by Mankiw et al. (2009) and Diamond and Saez (2011), who derive tax prescriptions with a focus on the US tax system. The *Mirrlees review* (Mirrlees et al., 2010) makes a comprehensive attempt at improving taxation in the United Kingdom. What distinguishes the present report from earlier contributions is its focus on the Swedish case. Moreover, the present report also discusses some very recent developments in the optimal taxation literature.

Beyond the material reviewed in the present survey, the academic literature also includes a large number of contributions on positive (rather than normative) aspects of taxation. The positive branch of the literature is mainly empirical and does, in particular, study the economic efficiency and the incidence of taxation. By contrast, the optimal taxation literature addresses the normative question of optimal tax design and is mainly focused on the taxation of labour incomes, capital incomes and commodities, whereas property taxes, corporate taxes and entrepreneurial taxes have received less attention.

2. What can policy makers learn from the theory of optimal taxation?

This section tries to summarize the main insights from optimal taxation theory in easily accessible, nontechnical terms. The discussion covers taxes on labour incomes, capital incomes and commodities (e.g., value added taxes and excise duties such as alcohol or tobacco taxes). Special attention is paid to the role of external effects and the case of tax allowances.

The theory of optimal taxation has a long tradition in economics. Nearly a century ago, Pigou (1920) argued that externality problems warranted corrective taxation. To illustrate this idea, Pigou suggested that industrial production could harm local residents through congestion, loss of light and health damages from pollution. Therefore, a tax on industrial output might help reduce the negative side effects of production. Another prominent early contribution to optimal tax theory by Ramsey (1927) studied how gov-

ernments could raise revenues from commodity taxes at small efficiency costs. Some decades later, Mirrlees (1971) revolutionized the field and introduced a new conceptual framework to analyse taxation. Mirrlees' contribution to tax theory and economic theory more generally was also acknowledged by the Prize in Economic Sciences in Memory of Alfred Nobel in 1996.

Following Mirrlees' tradition, the common approach in modern economic research is to analyse tax systems with the aim of maximizing a given social objective. This objective is defined by a social welfare function that aggregates measures of individual well-being across the population. The overall aim is to choose taxes in order to make society as well off as possible, where the notion of social welfare depends on average outcomes as well as the distribution (or inequality) of outcomes. To avoid making strong normative assumptions, economists typically explore a large class of feasible social welfare functions. For example, it is common to explore tax systems under different assumptions about the preference for redistribution embodied in the social welfare function.

Once the objective has been specified, models of optimal tax theory describe the constraints governments face when choosing the tax system. In particular, the tax system must satisfy some budgetary requirement. Moreover, it is crucial to formalize possible adverse consequences (disincentive effects) caused by taxation. For example, a high tax on labour incomes can induce individuals to exert less effort on their job, or switch to a low-paid occupation that is attractive for non-pecuniary reasons (short working hours, convenient location, pleasant working conditions, etc.). Taking into account such behavioural responses is fundamentally important for the optimal design of the tax system.

At the heart of most optimal tax problems lies a tension between equity and efficiency. The tax designer generally prefers relatively equal economic outcomes (equity) in the population. However, because of negative incentive effects of taxation, redistribution comes at the cost of economic efficiency. Without this trade-off, there would be a socialist utopia: tax rates on incomes could be set to 100 per cent and the revenues could be redistributed to make all households equally well off without any efficiency loss.

Implicitly, lump-sum taxation is ruled out. A lump-sum tax is a tax that cannot be avoided. That is, the amount of the tax is fixed irrespective of changes in the taxed entity. Because the relative prices of goods remain fixed, economic efficiency is not affected by lump-sum taxation. Therefore, uniform lump-sum taxes ("head taxes") enable the tax authority to raise revenues without efficiency losses. Yet, uniform lump-sum taxes do not help with the problem of redistribution. To achieve a more equal distribution of after-tax incomes, *individual-specific* lump-sum taxes (or transfers) are required. For instance, if individuals differed in their ability to earn labour income and the tax authority had perfect information, it could tax individuals in a lump-sum fashion based on their individual earnings abilities rather than their actual earnings. That is, the marginal tax rate on earnings could be set to zero, implying that the incentives to work remain fully intact. In that case, the tax authority would be able to levy differential taxes without behavioural consequences (except perhaps for income effects: behaviour may change because the wealth of taxpayers

changes) and the trade-off between equity and efficiency would vanish. In practice, however, it is highly unlikely that tax authorities have all relevant information on individual taxpayers. Thus, to make the analysis of taxation applicable to real-world tax systems (and nontrivial from a theoretical point), lump-sum taxation is generally ruled out. That is, optimal tax theory considers taxes that depend on the behaviour rather than the characteristics of the taxpayers.

The basic approach of optimizing a social welfare function subject to a set of constraints applies to virtually all analyses of optimal taxation. In what follows, the formal details of the optimal taxation models will be omitted and the focus will be on the main results derived from these models.

2.1. Taxation of labour incomes (including payroll taxes)

The modern theory of optimal income taxation originates from Mirrlees' (1971) pioneering article. In Mirrlees' analysis, the key trade-off is between equity and efficiency: redistribution from high earners to low earners makes after-tax earnings more equal, but reduces the incentive for high earners to work. Simply put, tax design in the Mirrlees model faces a tension between having a large pie and having an equal distribution of the pie. Optimal tax systems find a reasonable trade-off between these two conflicting goals.

Diamond (1998) and Saez (2001) characterize the solution to Mirrlees' model in a particularly transparent way. They show that three main elements determine the optimal shape of the tax system: the elasticity of taxable income with respect to the marginal tax rate, the distribution of abilities and the social preference for redistribution.

In order to describe the role of these three elements, consider a hypothetical tax reform which increases the marginal tax rate on incomes between 500k and 600k SEK by one percentage point from, say, 51% to 52%. Then, all individuals whose incomes fall into that range face a higher marginal tax rate and may be tempted to earn somewhat less (work fewer hours, bargain less hard for a pay rise, engage more in tax avoidance or evasion activities, etc.). The magnitude of this adverse behavioural effect of taxation is measured by the elasticity of taxable income with respect to the marginal tax rate. If this elasticity is large, the marginal tax rate has a strong effect on taxable income. In that case, increasing the marginal tax rate will yield relatively little additional tax revenue. Hence, other things equal, marginal taxes should be small when behaviour is highly responsive to the marginal tax rate.

A second effect of the proposed tax hike is that individuals earning incomes in excess of 600k SEK need to pay 1k SEK more taxes, because the marginal tax on all incomes between 500k and 600k SEK increased by one percentage point under the reform. Their marginal tax remains unaffected by the reform, because the marginal tax rate changed only in the income band between 500k and 600k SEK. (If the motivation to earn income does not only depend on the marginal tax rate but also on wealth, individuals with earnings above 600k SEK might, in fact, increase their efforts to earn income because the tax hike has made them poorer. Saez (2001) provides a formal discussion of such effects.) The

increased tax take from these higher earners has a redistributive value. How big this value is depends on the social preference for redistribution.

Finally, to relate the adverse behavioural effect to the positive redistributive effect, it becomes important how large is the group of taxpayers whose marginal tax rate changes (earners in the band between 500k and 600k SEK in the example) as compared to the group that pays a higher total tax (earners above 600k SEK). Therefore, the distribution of individual earnings abilities in the population becomes a third factor in the determination of optimal taxes. Other things equal, the marginal tax rate should be high in income ranges where there are few individuals who are affected at the margin, but many inframarginal individuals whose tax payments increase when the marginal tax is raised on incomes below their own. For instance, the tax reform considered above is particularly appealing if relatively few individuals earn incomes in the range between 500k and 600k and many individuals earn incomes above 600k. Recall that individuals with earnings between 500k and 600k may be tempted to earn somewhat less because their marginal tax rate increases under the reform, whereas individuals with higher earnings pay a larger total tax but face the same marginal tax rate as before.

The optimal tax system is obtained when the adverse behavioural effect and the positive redistributive effect (weighted by the relevant population shares) form a reasonable relationship. The defining feature of an optimal tax system is that there exists no reform of the marginal tax rates in any income range such that social welfare in the population improves after the reform. The optimality condition in the Mirrlees model expresses this condition in formal terms using the three elements highlighted above: the elasticity of taxable income with respect to the marginal tax rate, the distribution of abilities and the social preference for redistribution.

The academic literature on optimal income taxation largely focuses on taxes paid by the individual. Payroll taxes (social security contributions) paid by employers only play a secondary role in this literature. Payroll taxes are simpler than general income taxes because they are restricted to employment earnings, the tax rate is typically flat, and earnings are often considered only up to a cap. The main purpose of payroll taxes is to finance social security programmes such as pensions, health care, unemployment insurance and parental benefits, for example. As a consequence, the eligibility criteria and the expenditure patterns of these programmes predetermine the design of payroll taxes to a large extent. In particular, if payroll taxes were set in an actuarially fair way, no degree of freedom would remain regarding their design.

Payroll taxes with no link to benefits are equivalent to standard taxes on labour income. In that case, their design involves the same trade-offs as for taxes paid directly by the individual. In Sweden, for instance, payroll taxes are charged on the full wage, but benefits are capped at a certain level. This feature of the Swedish tax system gives rise to similar behavioural and redistributive effects as the central government income tax. Relatedly, several European countries finance their health care systems by a proportional payroll

tax, implying that individuals make different contributions despite having identical entitlements to health care. Moreover, payroll taxes for unemployment insurance are typically not differentiated, even though some sectors have lower layoff risks than others. Although such redistributive elements of payroll taxes are similar to those of standard labour income taxes, this particular form of redistribution is not given much attention in the optimal tax literature.

2.2. Taxation of capital incomes (including property/real estate taxation and corporate taxation)

Capital income taxes are a major source of government revenues across the world. Nonetheless, the theoretical findings on the desirability of capital income taxation are quite mixed. A number of influential contributions from the 1970s and 1980s argue that capital incomes should not be taxed at all. Some more recent articles challenge this view and identify economic mechanisms that earlier studies have neglected. Yet, there is still little academic consensus on the most relevant trade-offs for capital income taxation and the order of magnitude of optimal tax rates. Different from the issue of labour income taxation, a comprehensive approach summarizing all economic responses to capital income taxation in terms of simple statistics has not yet emerged.

The main rationale against capital income taxes is that taxation distorts the intertemporal consumption choice. First, Atkinson and Stiglitz (1976) analyse in a seminal article whether consumption goods should generally be taxed at different rates. Their findings also shed some light on capital taxes, because taxing capital incomes means that the price of consumption goods depends on time: the higher the tax on capital incomes, the less attractive it is to save and, thus, the more expensive it becomes to consume tomorrow rather than today. An immediate application of the “Uniform Taxation Theorem” by Atkinson and Stiglitz (further discussed in Section 2.3 below) implies that capital incomes should not be taxed.

Second, Chamley (1986) and Judd (1985) provide an argument against capital income taxes based on the analysis of very long (in fact, infinite) time horizons. Simply put, their argument builds on the logic that taxing capital income generates an ever-growing distortion of the price of consumption. Taxing capital income means that next year’s consumption becomes more expensive relative to this year’s consumption. Similarly, it becomes more expensive to consume ten years from now rather than nine years from now, and so on. By repeating this argument, a tax on capital income will make consumption in the very far future extremely expensive from the present point of view. Those extreme distortions can only be avoided if the tax on capital income is zero. Although Chamley and Judd provide an important theoretical benchmark, the interpretation and relevance of their result are not without controversy among economists. In particular, recent research indicates that their result is not as general as initially assumed (Straub and Werning, 2014).

There are various counterarguments against the zero-tax results by Atkinson and Stiglitz (1976), Chamley (1986) and Judd (1985). First, Atkinson and Stiglitz mainly focus on a

cross section of goods and their model has shortcomings when it is applied to an intertemporal context. Dynamic uncertainty is particularly missing in their analysis. In practice, individuals face an uncertain future when making savings decisions. For instance, a worker may lose her job in the future or may be forced to switch occupations for health-related reasons. A product designed by an entrepreneur may become outdated after technological innovations. If uncertainty plays a role for savings decisions, capital income taxation becomes desirable again (Diamond and Mirrlees, 1978; Golosov et al., 2003). The practical relevance of this finding is still subject to some debate, because optimal capital income taxes in environments with dynamic uncertainty are complex objects that depend on the full history of an individual's income (Kocherlakota, 2005). Moreover, the welfare gains and the implied tax rates on capital incomes vary considerably across studies (Farhi and Werning, 2013; Abraham et al., 2016; Golosov et al., 2016).

Second, several studies demonstrate that the Chamley-Judd result becomes invalid in lifecycle models. In such models, individuals have shorter time horizons and the extreme distortions from Chamley's and Judd's analysis can be neglected. Moreover, in lifecycle models, individual attributes (such as the attachment to the labour force) typically change as people age, creating a reason for age-dependent taxation. For example, if labour supply decisions of workers close to retirement are particularly sensitive to the tax rate, there can be a case for lower marginal taxes on older workers. If the tax code does not explicitly depend on age, capital income taxes (or subsidies) can help target age-specific subgroups of the population in order to mimic age-dependent taxation (Erosa and Gervais, 2002). Capital income taxation is also warranted in frameworks with imperfect credit markets (Aiyagari, 1995). For example, if households face tight borrowing constraints, a tax on capital income can be useful because it redistributes from wealthy to constrained households. Conesa et al. (2009) combine borrowing constraints and age-dependent labour supply profiles in a macroeconomic simulation for the United States. They conclude that capital income taxes should be significantly positive.

Difficulties in distinguishing returns to capital from returns to labour provide a further justification to tax capital incomes (Christiansen and Tuomala, 2008). For example, self-employed workers might have discretion to report some of their business income as a return to their capital investment rather than their entrepreneurial effort. Hence, if labour income is taxed, but capital income is not, creative accounting could enable self-employed workers to substantially reduce their tax bills.

An alternative motivation to tax capital income is due to the role of inheritances. Inherited wealth is a key driver of inequality and, thus, an important source in explaining differences in capital incomes across the population. Some studies argue that inheritances should be taxed at high rates if society cares about those receiving small inheritances. Piketty and Saez (2013), for instance, argue that optimal tax rates on inheritances could exceed fifty per cent. If actual taxes on inheritances are too low, a capital income tax can make up for parts of the difference. In practice, high levels of inheritance taxes may be difficult for the following reasons: problems for widows/widowers to stay in an owner-

occupied dwelling, frictions when a family-owned firm is taken over by the next generation, and incentives for tax avoidance.

Besides capital income taxes, property taxes constitute a second major form of wealth taxation. Property taxes are levied on property values rather than incomes derived from those properties. Hence, it becomes possible to tax objects that generate returns not visible in market transactions. In particular, imputed rents from owner-occupied (private or corporate) housing can be addressed by a property tax. The imputed rent describes the amount of money that would have changed hands had the owner and occupier been different individuals. Note that when the owner is not the occupier, she receives capital income in the form of monthly rents and needs to pay taxes on this type of income. Therefore, to the extent that the sheltering of imputed rents seems unfair, property taxes are well justified. Indeed, many countries impose property taxes on real estate. These taxes are typically levied by local authorities and serve to fund public goods. Property taxes are generally attractive for local authorities because land and real estate are immobile and cannot escape from taxation. Hence, the desire to tax imputed rents may not be the only reason for property taxation in practice.

The academic literature on property taxation largely focuses on the incidence of the tax rather than its normative implications. One possible explanation is that, when property taxes are used to finance local public goods, optimal tax theory would strongly depend on assumptions about the individual-specific valuations of these goods.

Closely related to capital income taxation is the issue of corporate taxation. Here, taxation already takes place at the firm level rather than at the level of an individual who receives a share of corporate profits. Optimal tax theory provides a clear prescription for profits from economic rents (profits purely from non-produced inputs such as land, natural resources, market power, etc.). The tax system should fully skim such rents because taxing non-produced inputs is not distortive. In practice, however, it may be difficult to determine the exact share of a firm's profits that is due to economic rents.

Apart from the extraction of economic rents, optimal tax theory generally argues that the tax authorities should not get involved in the businesses of private enterprises. A particularly well-known version of this insight is the *Production Efficiency Theorem* by Diamond and Mirrlees (1971). The theorem states that productive efficiency is desirable even when other private decisions (e.g., consumption) are distorted by taxation. Production efficiency requires that all firms face the same prices for inputs and outputs. Therefore, there should be no taxes on inputs (or intermediate goods) that differ across firms. The underlying rationale is roughly as follows. Differential taxes on productive inputs will eventually change the relative prices of final goods. Moreover, such taxes will make production inefficient because the producer cost of inputs will differ from the true resource cost. By contrast, if taxes are only imposed on final goods, the same system of relative prices for final goods can be obtained without forfeiting any output due to productive inefficiencies. Notably, the production efficiency result also suggests that taxes should not differ between corporate and unincorporated businesses. That is, if corporate incomes are taxed,

the total (corporate plus personal) tax burden on the returns to corporate capital should match the tax burden on the returns to non-corporate investment (see Devereux and Sørensen, 2006).

Albanesi (2006) argues that deviations from a neutral taxation of different capital investments can be advisable for the case of entrepreneurial capital. Because the return to entrepreneurial capital depends on the entrepreneur's own effort, a differential taxation of entrepreneurial investment and general (corporate or non-corporate) investment is desirable for incentive reasons. However, the optimal tax wedge between these two types of investments is difficult to assess and depends, among other things, on their risk correlation. Apart from this particular contribution, the taxation of entrepreneurs has received relatively little attention in the optimal taxation literature.

Sørensen (2007) proposes an alternative argument for a differential taxation of capital incomes. The argument is based on the assumption that capital is internationally mobile and foreign investment cannot be taxed. Under those assumptions, Sørensen shows that capital income taxes should depend on the sector-specific capital/labour intensities. However, it is not obvious whether capital income taxation would actually be welfare enhancing in such a model.

Finally, even without the considering production efficiency result, it is not at all obvious why a tax on corporate income should be implemented if a well-designed system of capital income taxation is in place. Any tax on corporate income ultimately amounts to a specific capital income tax. Until now, there has been no widely accepted argument in the optimal tax literature as to how corporate taxation can improve upon capital income taxation at the individual level.

2.3. Taxation of commodities (value added taxes, excise duties, etc.)

Compared to the lessons for the taxation of labour incomes and capital incomes, the findings in the literature on optimal commodity taxes are strikingly simple. The most influential result in this literature is the *Uniform Taxation Theorem* derived by Atkinson and Stiglitz (1976). In their seminal article, they show that when income can be taxed nonlinearly (i.e., when marginal tax rates on income are allowed to vary by income level), commodity taxation should be uniform, i.e., all consumption goods should be taxed at the same rate. This result is driven by the fact that nonlinear income taxation is generally a powerful tool to perform redistribution. Commodity taxation, in contrast, is a coarse instrument that affects prices and, thereby, distorts the consumption decisions in the entire population. Such distortions can cause large efficiency losses. Therefore, it is better to perform redistribution through income taxes and other direct means of redistribution such as the social security system and the pension system. This result has been extended and qualified in various ways in the subsequent literature, and remains a cornerstone of optimal tax theory as of today.

In particular, the Uniform Taxation Theorem shows that commodity taxes are not justified based on redistributive grounds. Therefore, this theorem provides a strong argument

against proposals to tax necessities such as food at reduced rates, or tax luxury goods at particularly high rates. At the same time, the Uniform Taxation Theorem does not preclude that commodity taxes raise government revenue. However, commodity taxes should be set in a way that minimizes the distortions caused by taxation. That is, if commodity taxes are nonzero, they should be uniform across goods.

There are some important exceptions where the Uniform Taxation Theorem does not hold. First, the tax rates should differ for goods that impose positive or negative effects on third parties (e.g., environmental damages). This topic is discussed in detail in Section 2.4.

Second, goods or services related to earnings activities should also be treated differently (Atkinson and Stiglitz, 1976; Christiansen, 1984). More specifically, any good that helps individuals boost their incomes should be taxed at a lower rate. Examples include job-related books, apparel and equipment, or expenses for professional development. Another relevant example is childcare, because childcare services facilitate the labour supply activities of parents. In order to tax those goods and services at preferential rates, one possibility would be to reduce the rate of the value added tax. A more targeted approach is to subsidize those items through reductions in the income tax system. The latter possibility is explored in Section 2.5 further below.

Third, there can be a case for differential commodity taxation if the preferences for some consumption goods are correlated with individual earnings abilities. If individuals with a higher earnings ability have a stronger preference for a specific good, this good should be taxed at a higher rate. Simply put, such a tax is similar to a direct ability tax and contributes to the redistribution with rather small adverse consequences for earnings activities. In this particular situation, a commodity tax can be a more efficient instrument for redistribution than a nonlinear income tax. However, identifying examples of goods that are preferred by high-ability individuals is a very difficult task in practice. Note that it is not sufficient to observe that a high-ability individual consumes more of a particular good, say oysters, than a low-ability individual. It must also hold that the high-ability individual would still consume more oysters than the low-ability individual, if both had identical levels of income. However, consumption decisions for such hypothetical income levels are never observed in the data.

Fourth, differential commodity taxation may be beneficial when consumption goods are durable (Koehne, 2017). Durable goods are similar to savings. Thus, their purchase may diminish the incentive to earn incomes in the future. Given that housing is a prime example of a durable good, this mechanism could justify a tax on housing investments. However, the empirical evidence linking housing investment and labour supply decisions is not fully conclusive. For instance, quasi-experimental evidence by Sodini et al. (2016) suggests that home ownership makes households work harder.

Last but not least, it seems important to mention two prominent early contributions on commodity taxation. Ramsey (1927) explores optimal linear commodity taxes when the tax authority has a given revenue target. The goal of commodity taxes is to minimize the deadweight losses caused by taxation. Assuming that the demand functions for different

goods are independent from each other (i.e., there are no cross-price effects), Ramsey establishes the *Inverse Elasticities Rule*: commodity taxes should be inversely related to the elasticity of demand. That is, goods whose demand is relatively inelastic should be taxed at high rates. As demonstrated by the Uniform Taxation Theorem (Atkinson and Stiglitz, 1976), the Inverse Elasticities Rule becomes invalid when nonlinear taxes on income are feasible (or when cross-price effects are nonzero). Building on Ramsey's general framework, Corlett and Hague (1953) argue that income taxation induces individuals to consume more leisure. Therefore, it is advisable to tax goods that are more complementary with leisure at higher rates, thereby raising the implicit price of leisure and alleviating the distortion of the income tax. Although there are large differences in modelling assumptions (Corlett and Hague study linear taxation in a representative agent model, whereas Atkinson and Stiglitz allow for nonlinear taxes and heterogeneous households), the *Corlett-Hague Rule* can be interpreted as an early version of the idea that goods contributing to earnings activities should be taxed at lower rates (Atkinson and Stiglitz, 1976; Christensen, 1984).

2.4. The need to correct for external effects (environmental/climate taxes, green tax swap, health corrective taxes, etc.)

External effects (or externalities) arise if an activity imposes a cost or benefit on a third party. For example, the consumption of cigarettes has a negative effect on other people's health through passive smoking. Driving a car makes roads more congested, which results in delays for other drivers and may increase the number of accidents. A factory polluting the environment causes harm for crops, animals and public health. Although many examples of external effects involve costs imposed on other parties, there are also cases of positive externalities, where an activity is beneficial for a third party. For example, beekeepers have a positive impact on the local environment because their bees pollinate the surrounding crops. A firm offering first-aid courses to its employees may contribute to saving lives beyond the workplace. A vaccination does not only protect the patient from an infection, but also diminishes the risk that the patient transmits the disease to others.

When production or consumption activities cause externalities, market prices tend to be inefficient because they do not reflect the costs or benefits incurred by third parties. Corrective taxation is then desirable to make economic actors internalize these costs (or benefits). This fundamental insight has a long tradition in the economic literature and goes back at least to Pigou (1920). Baumol (1972) framed Pigou's findings in modern economic language.

Honouring Pigou's contribution, taxes that correct externalities are often labelled as *Pigouvian taxes*. According to Pigou, the tax rate should be set equal to the marginal social damage of the activity causing the externality. Such an intervention corrects market prices and makes all economic actors internalize the true social costs of their activities. For example, if a firm pollutes the environment (a negative production externality), an emission tax will make production more expensive for the firm. Therefore, the tax will likely reduce the firm's production activities, resulting in less pollution. Moreover, in the

long run, the tax may encourage research and development efforts focused on cleaner technologies, again leading to a gain for the environment. As illustrated by this case, a Pigouvian tax guides the firm to reduce a socially harmful activity and impose smaller environmental costs on others.

Generally, externalities in the form of environmental damages are prime examples where a corrective taxation is socially desirable. One particular way of increasing the tax burden on environmentally harmful activities is to perform a *green tax swap*, i.e., to increase the tax on polluting activities while simultaneously reducing the tax on some other, environmentally neutral activity such that the total tax revenue remains approximately constant. Proponents of such reforms often argue that a green tax swap entails a double dividend, because it reduces environmental damage and diminishes distortions created by other taxes. However, it is important to keep in mind that a “perfect” corrective tax on polluting activities does not exist. First, measuring the social cost of a specific source of pollution is very difficult in practice, because the effects of pollution are uncertain and stretch far into the future. Moreover, there are technological constraints that make a precise measurement of some forms of emissions impossible or very costly. Therefore, the rate of an environmental tax can easily be chosen too high, implying that the tax would create a new form of inefficiency. Moreover, firms may be tempted to move production activities to countries without pollution taxes and laxer environmental standards. In that case, the introduction of an environmental tax could actually increase pollution at a global level. Yet, although these issues cast some doubt on the exact consequences of a shift towards greener taxation, the theoretical justification of taxes that correct environmental externalities remains pervasive.

Goods that cause health damages constitute a second important group where a corrective taxation can have benefits for society. The consumption of alcohol and tobacco (along with illegal drugs, for which a tax is not enforceable) is particularly associated with negative externalities. Two types of effects are relevant here. First, the consumption of these goods can cause direct harm for specific individuals. For example, a smoker may harm other household members through passive smoking. A drunken person may be more likely to start a violent fight or cause a car accident in which other people are injured. Second, the consumption of alcohol and tobacco affects the health of the consumer. Since health costs are shared by society, any adverse medical consequences impose a monetary burden on others. Moreover, there may be further effects on the public budget because the health status can affect an individual’s earnings (and hence tax contribution) as well as her expected pension benefits.

More generally, when health care is publicly financed, externalities emerge from any behaviour that is bad for the individual’s own health (e.g., smoking, drinking too much alcohol, unhealthy food, and even some sports) because other people pay for the treatment of the consequences. Therefore, the associated public budget externality can be used to justify a corrective tax on other forms of unhealthy behaviour. For instance, Denmark and India have recently experimented with a tax on fat foods. France, Norway, Mexico and many US states have introduced a tax on soft drinks.

2.5. Tax reductions such as earned income tax credits, *RUT* and *ROT*

Income tax systems often feature two common types of tax reductions. First, there is a personal allowance up to which income is not taxable. More broadly, there can be low (perhaps even negative) tax rates on low levels of income (earned income tax credits, *jobbskatteavdraget*). Second, tax rules can define specific items that diminish an individual's taxable income or reduce that person's tax bill in some other way (e.g., *RUT* and *ROT avdrag*).

From a general point of view, the first type of tax reduction is just a particular form of a marginal tax rate that depends on income. Therefore, the theoretical study of such reductions is a special case of the general analysis of labour income taxation as described in Section 2.1.

In its most basic form, the Mirrlees model of optimal income taxation (Mirrlees, 1971) prescribes that the marginal tax rates on labour incomes should be nonnegative at all income levels. This result implies that tax credits for low earners should not be overly large (in terms of marginal rates), i.e., they should not lead to situations in which an extra krona of labour income increases the individual's after tax-income by more than one krona. Stated differently, the Mirrlees model is compatible with a preferential tax treatment of low incomes, but it rules out the possibility that the tax system marginally subsidizes incomes. However, the original Mirrlees framework focused on labour supply decisions along the intensive margin, i.e., on the decision of how hard to work given that the individual participates in the labour force. For potential earners of low incomes, a very relevant decision is whether or not to work at all. For example, some individuals may find it unattractive to work because they live in a remote destination with few jobs, or they have to look after young children or elderly parents. Once this extensive margin of labour supply is accounted for, optimal tax rates on low incomes may become negative (Saez, 2002; Chone and Laroque, 2011). This finding can possibly justify the use of income subsidy schemes for lower earners such as, for example, the *Earned Income Tax Credit* programme in the United States, where the after-tax income of lower income earners increases by more than one dollar for each additional dollar of before-tax income.

The second type of tax reduction, where specific expenses reduce an individual's tax bill, is generally sensible if the expenses contribute to the individual's earnings potential. Two broad categories of items are relevant here. First, investments in human capital (educational expenses, job-related clothing and equipment, professional development courses, etc.) should receive a favourable tax treatment, because such investments boost the individual's productivity. A more productive individual tends to earn higher incomes, generating larger tax returns for society. This beneficial social effect (a positive fiscal externality according to the terminology of Section 2.4) justifies tax rules that reduce the costs of human capital investments for the individual (Bovenberg and Jacobs, 2005).

Beyond productivity enhancing investments, an individual's earnings potential also depends on the time that is available for work. Hence, goods and services that help households save time are socially desirable and should be encouraged by the tax system

(Kleven, 2004; Koehne and Sachs, 2016). The reason is that households can earn higher incomes, and pay higher taxes, when they have more time for market work. For instance, a baby sitter picking up children after pre-school can help parents work full time rather than part time. In addition to childcare services, other household chores such as cleaning, washing, gardening and home improvement activities (repairs, renovations, furniture assembly, etc.) are further examples that reduce individuals' time budgets. If households hire a professional to carry out such tasks on their behalf, they can arguably improve their possibility of being successful, well-paid earners. This process entails positive fiscal externalities in the form of higher revenues from income taxation. Therefore, tax reductions for household-related services (e.g., *RUT-avdrag*, *ROT-avdrag*) are supported by the findings from optimal tax theory.

3. What are the main limitations of the theoretical conclusions as regards practical policy relevance?

Although research on optimal tax theory follows a normative approach, not all results in this literature generate immediate policy recommendations. This section presents a tentative list of reasons that may limit the practical application of theoretical conclusions. At the same time, the discussion points out areas where future research efforts might help narrow the gap between tax theory and policy advice.

3.1. Measurement of economic effects

Optimal tax theory seeks to understand the fundamental determinants of successful tax systems. The theoretical conclusions often provide clear recommendations about desirable *qualitative* properties of taxation. However, policy makers are also interested in *quantitative* advice: is a given tax rate too high or too low from an optimal taxation perspective?

For a quantitative evaluation of the theoretical findings, it is important to know the sizes of the involved economic effects as exactly as possible. For example, the Mirrlees (1971) model of optimal income taxation provides an elegant theoretical formula for the taxation of labour incomes. Yet, to numerically evaluate this formula, it is inevitable to have good measures of three fundamental determinants: the elasticity of taxable income, the social preference for redistribution and the distribution of earnings abilities. None of these objects is trivial to measure.

The elasticity of taxable income (ETI) is a central issue in labour economics and expresses how responsive the tax base is to changes in the marginal tax rate. Formally, the ETI measures the percentage change in reported income when the net-of-tax rate (one minus the marginal tax rate) increases by 1%. That is, the ETI is 0.5 if a 10% increase in the net-of-tax rate implies that taxable income increases by approximately 5%. Labour economists attempt to estimate the ETI using changes in marginal tax rates across time, space

or groups of individuals. There is some general consensus on a range of plausible estimates. Yet, simulations of optimal tax rates are quite sensitive to this parameter and vary substantially within the range of values that is currently empirically plausible. Another challenge is that estimations typically identify a local value of the ETI (or an average value across the income range). However, the ETI may well depend on earnings; for example, the ETI can be higher for top earners if top earners are more mobile across countries. Future research will most likely be able to exploit better data sets in order to gain a more precise understanding of ETI. This should make simulations of optimal income taxes more reliable.

Currently, most estimates of the ETI (with respect to the marginal net-of-tax rate) lie in a wide range between 0.1 (e.g., Kleven and Schultz, 2014) and 0.9 (e.g., Weber, 2014). For an extensive literature review, see Saez et al. (2012). Many contributions to this literature exploit tax reforms in the United States. Given the differences in labour markets, institutions and tax systems between the US and Sweden, these estimates may have a somewhat limited relevance for Swedish tax policy.

Blomquist and Selin (2010), Gelber (2014), and Bastani and Selin (2014) estimate elasticities of taxable income specifically for Sweden. As shown by a comparison of these studies, ETI estimates can show a large amount of variation even for a given country. Blomquist and Selin (2010) explore Swedish tax reforms between 1981 and 1991 and use data from the representative Swedish Level of Living Survey. They report an (uncompensated) ETI of approximately 0.2 for males and a range of 0.96–1.44 for females. Note that the uncompensated version of the ETI includes two types of responses to tax reforms. First, if the net-of-tax rate increases, the relative price of leisure increases and individuals tend to work more because of a substitution effect. Second, individuals become richer if the net-of-tax rate increases. Hence, they tend to work less because of an income effect. There is also a compensated version of the ETI that isolates the pure substitution channel. For this reason, the compensated ETI is typically larger than the uncompensated elasticity. For example, in the study by Blomquist and Selin (2010), the compensated elasticity is about 5 percentage points higher for males (and 2 percentage points higher for females) than the uncompensated one. Gelber (2014) explores the large Swedish tax reform of 1990/91 based on the Longitudinal Individual Dataset for Sweden (LINDA), which contains administrative records for about 3% of the Swedish population. In this study, the main estimates of the (uncompensated) ETI are 0.21 for husbands and 0.23 for wives. The compensated elasticities for husbands and wives are 0.41 and 0.47, respectively. Finally, Bastani and Selin (2014) exploit administrative records covering the whole universe of Swedish taxpayers between 1998 and 2005. The empirical methodology in their study is as follows: when behaviour responds to taxation, any jumps in the marginal tax rate should imply that a disproportionate number of taxpayers bunch at the kink points of the tax system. Yet, at least among wage earners, they find no economically significant bunching at the most relevant kink point. This finding suggests that the compensated ETI (around the in-

come level of the kink point) may be very close to zero. Like most other empirical approaches, the estimates by Bastani and Selin (2014) refer to the short-run responses to taxation. Therefore, the long-run elasticities may differ from these results.

A precise measurement of economic effects is also crucial for the case of externalities. For instance, environmental taxes cannot be appropriately chosen without convincing estimates of the social costs of environmental damage. Estimations of such costs are particularly intricate for greenhouse gas emissions, because long time lags occur between an emission and its full climatic impact. Moreover, climate change can have diverse consequences throughout the world, which makes a comprehensive accounting of all costs and benefits quite challenging in practice.

Measuring the social costs of health-related externalities is not a trivial task, either. For the case of smoking, for instance, the social costs include adverse external effects through passive smoking as well as publicly funded costs for the treatment of smoking-induced diseases. Moreover, health problems associated with smoking can make workers less productive, leading to lower revenues from income taxation. At the same time, there are effects on the public budget because smokers have lower life expectancies and receive smaller pension benefits in expectation. In a widely cited study, Manning et al. (1989) present a comprehensive evaluation of the external effects of smoking in the United States. They find the external costs of smoking to be of a similar magnitude as the US tax on cigarettes at the time. However, smoking habits, health technologies and tobacco taxes have all changed in recent years and, hence, the calculation could look quite different now. Moreover, there is evidence that the external costs of smoking may differ across countries. For example, Barendregt et al. (1997) find that quitting smoking tends to increase an individual's long-run health care costs in the Netherlands, whereas Rasmussen et al. (2004) report substantial health cost savings of smoking cessation in Denmark.

Given the close link between externalities and optimal corrective taxes, measuring the external costs of environmental harm and unhealthy behaviours (consuming alcohol, tobacco, unhealthy foods, sweet beverages, etc.) should rank high on the agendas of researchers, think tanks and policy makers.

3.2. Welfare objective

The social welfare objective is a key input for most studies in optimal tax theory. Formally, this concept determines how society values the transfer of a krona of tax revenue to different individuals in the population. The optimal tax literature generally assumes that some redistribution is desirable. More precisely, it is assumed that, absent behavioural consequences, society prefers giving a krona to a low-income rather than a high-income person. Yet, how quickly these social welfare weights change across income levels is far from clear. Academic research typically sidesteps this deeply normative issue and instead explores a large host of possibilities. However, aiming for generality comes at the cost of predictive power.

There is a small but growing literature investigating the role of the social welfare objective for optimal policy. Some contributions analyse the normative criteria that guide actual policy proposals. For example, Zoutman et al. (2016) study the social preferences of Dutch political parties as reflected by their election programmes. Bastani and Lundberg (2016) explore the preferences for redistribution inherent in Swedish tax policy. They find that the implied social welfare weights are high for non-workers, small for earners of low incomes, hump-shaped around median incomes, and negative at the top of the income distribution.

Other articles question the general approach of social welfare maximization and call for a generalization of the objective or an entirely different normative approach. In particular, Saez and Stantcheva (2016) present an optimal reform approach that puts weight on the status quo and allows for more general notions of social welfare weights than standard theory. For instance, welfare weights may depend on personal characteristics that do not enter individuals' utilities. Moreover, their framework includes principles such as "equality of opportunity" or "poverty alleviation" as possible goals for policy. Relatedly, Weinzierl (2014) presents survey evidence on views about redistributive taxation in the United States. In his study, a sizable fraction of respondents reject at least some consequences of conventional welfare objectives. Many respondents support the principle of "equal sacrifice", where taxation is chosen such that the loss of utility as a result of taxation becomes equal for all taxpayers.

Ultimately, a better scientific understanding of the normative views shared by society will add further relevance to the predictions from optimal tax theory. Current research makes an early step towards this bigger agenda.

3.3. Insights from behavioural economics

Although the rational, well-informed consumer remains the benchmark in optimal tax theory, there is evidence that taxes also affect individuals in ways neglected by standard approaches. For example, Chetty et al. (2013) document that the knowledge about earned income tax credits in the United States is far from perfect. Moreover, knowledge is heterogeneously distributed across geographic areas.

There is also evidence on the importance of framing effects. These effects refer to a cognitive bias that changes an individual's perception depending on how a given situation is presented. For example, Chetty et al. (2009) show that sales taxes have different consequences depending on whether they are added at the register or included in posted prices. Similarly, individuals may perceive an economic incentive very differently when it is framed as a loss from a high baseline or as a gain relative to a low baseline. If such effects are appropriately managed, they can induce beneficial outcomes at zero economic cost. Indeed, Fryer et al. (2012) report that teacher performance improves when monetary incentives are depicted as a loss from a high salary instead of a bonus on top of a low salary.

Closely related to framing effects, behavioural economics also argues that defaults can affect individual decisions. For instance, Madrian and Shea (2001) show that the automatic enrolment of employees in a retirement savings plan (combined with an opt-out possibility) induces substantially higher enrolment rates in the plan than an opt-in system.

New policy tools may emerge from these insights. For instance, information campaigns, framing effects and well-designed defaults could improve public policies. Overall, behavioural economics also suggests that there can be costs to complexity. Hence, it may be advisable to choose tax systems that are simpler than those prescribed by standard theories.

Finally, insights from behavioural economics may also shed some light on the common public aversion against certain types of taxes. In Sweden, for instance, it seems to be politically difficult to justify a tax on imputed rents, because many taxpayers have concerns against taxes on non-monetary incomes. Moreover, forms of double taxation are generally unpopular. In particular, a widespread argument against the taxation of inheritances is that the accumulated wealth has already been taxed during the deceased's lifetime.

4. Recent taxation trends in the OECD countries and challenges for tax policy (globalisation, tax competition, digital transformation, etc.)

This section summarizes the recent trends for the taxation of labour incomes, capital incomes and corporate incomes in the OECD countries. Moreover, some potential challenges for current and future tax policy are discussed.

4.1. OECD trends

Figure 1 presents the evolution of labour income taxes for selected OECD countries from 2000 to 2015. The chart displays the average tax wedge of a single person without children earning the average wage in each country at the respective dates, where the tax wedge represents the combined burden of income taxation and employee and employer social security contributions net of cash benefits.

Overall, tax burdens on labour income have largely remained stable over the period: the average tax wedges across OECD countries were 36.6% in 2000 and 35.9% in 2015. Sweden stands out as a country where the tax wedges fell from 50.1% to 42.7%. Only Israel experienced a stronger decline in tax wedges during that period. Tax wedges also fell considerably in Denmark and Hungary. By contrast, tax wedges increased sizably in Iceland, Japan, Korea, Mexico and Portugal.

Figure 2 explores the progressivity of labour income taxation, measured as the gap in average tax wedges for single persons without children earning 167% of the average wage as compared to 67% of the average wage. Once more, no strong trend is visible. Averaged

across OECD countries, the progressivity measure was 8.0 percentage points (pp) in 2000 and 8.3 pp in 2015. In Sweden, the progressivity measure rose from 7.1 pp to 10.2 pp. Italy, The Netherlands, New Zealand, Turkey and the UK had even more pronounced increases of progressivity. By contrast, progressivity fell sharply in Hungary, Iceland, Ireland and Mexico.

Table 1 considers the taxation of high incomes. The table compares top marginal tax rates on labour earnings in selected countries between 2000 and 2015. Averaged across OECD countries, top marginal tax rates fell by 2 percentage points over that period. Yet, there is a great deal of heterogeneity across countries: from 2000 to 2015, the top marginal tax rates fell in 18 countries, and increased in 13 countries. In Sweden, the top marginal tax rate grew slightly from 55.4% to 57.0%.

In summary, for the OECD countries there appears to be no broad trend in the taxation of labour incomes over the considered period. However, a marked change took place in Sweden: from 2000 to 2015, the tax wedges of average earners fell significantly and the progressivity of the tax system increased. These changes were particularly pronounced in the years between 2007 and 2011, when the tax reductions of the Reinfeldt administration (*jobbskatteavdraget*) took effect.

Figure 3 considers the trends in capital income taxation for selected OECD countries between 2000 and 2016. The figure presents net personal tax rates on dividend incomes. Averaged across OECD countries, the dividend tax rate was 23.8% in 2000. The average rate declined to 19.5% in 2004 and then moved back to earlier levels, reaching 23.9% in 2016. In Sweden, personal tax rates on dividend incomes remained flat at 30% over the period considered.

A different trend appears for the total tax burden on distributed corporate profits. Figure 4 shows the overall (corporate plus personal) tax rate on distributed profits between 2000 and 2016. On average, the overall tax rate on distributed profits declined by more than 5 percentage points (from 48.2% in 2000 to 42.5% in 2016). In Sweden, the rate fell from 49.6% to 45.4%. Given that the tax rates on dividend incomes were similar in both years, falling corporate income taxes are responsible for the difference. Figure 5 indeed documents that corporate income tax rates on distributed profits declined from 31.7% on average in 2000 to 24.6% in 2016. All OECD countries except Chile and Hungary experienced a fall in corporate income tax rates during that period.

4.2. Challenges for tax policy

Businesses and governments are massively affected by the current *digital transformation*. In this process, an increasing number of operations are becoming paperless. Digital tax declarations have already become the new standard in several countries. The digital transformation has an obvious potential to make tax collection more efficient, reducing the administrative costs for governments as well as the compliance costs for the taxpay-

ers. However, academic research on optimal taxation largely abstracts from practical administrative details. Thus, the digital transformation has not had a strong impact on optimal taxation research.

Globalisation is another fundamental transformation that policy makers should take into account. Globalisation changes many aspects of society and can be relevant for tax policy through a wide range of mechanisms. In particular, globalisation tends to enhance the mobility of individuals, firms, goods and savings across borders. For example, the volume of cross-border shopping and internet orders from abroad has arguably increased in recent years. This trend may make it more difficult to levy value-added taxes that differ across countries.

Furthermore, globalisation may affect the earnings distribution. For instance, it is sometimes argued that low-skilled workers in rich countries lose from globalisation because their jobs can be outsourced to low-wage countries abroad. There are also arguments that higher earners, in particular top executives, may benefit from globalisation because successful firms can grow even bigger as the world becomes more connected. If globalisation affects within-country inequality, policy makers may want to act. Up to now, there is no strong evidence that globalisation has contributed to earnings inequality (OECD, 2011). Moreover, as shown by the discussion in Section 4.1, taxes on labour and capital incomes in OECD countries have remained stable in the last fifteen years. No clear trend is visible for average tax rates of typical earners, tax rates of top earners, or the progressivity of the tax system. The taxation of capital incomes (in the form of dividends) has been similarly stable over the period from 2000 to 2016. What these statistics do not show, however, are recent efforts by several advanced countries to crack down on tax havens in order to make capital income tax evasion more difficult. Yet, tax havens are not a new phenomenon and it is not obvious whether the recent steps against evasion were actually triggered by the process of globalisation.

In contrast to personal taxation, a robust trend towards lower corporate tax rates is visible for almost all OECD countries (compare Figure 5). During the globalisation process, many firms have internationally diversified their production and sales activities. This trend has arguably made it easier for firms to shift profits abroad to countries with lower tax burdens. Hence, the tax competition for corporate profits may have increased in recent years, possibly explaining the lower corporate tax rates in OECD countries.

5. Lessons for the Swedish tax system taking into account theory, practical relevance, OECD trends and tax challenges

This section draws policy conclusions from the previous findings. The goal is to derive some simple lessons for the Swedish tax system that take into account the general theoretical findings (including their limitations) as well as recent global trends and challenges for tax policy.

5.1. Taxation of labour incomes

Lesson 1: Given current empirical knowledge, optimal tax rates on labour incomes cannot be predicted with high precision.

Optimal tax theory has developed transparent formulas to characterize optimal marginal tax rates on labour incomes. These formulas weigh redistributive gains against adverse incentive effects of taxation. However, current empirical results (on society's preferences for redistribution and the responsiveness of behaviour with respect to taxation) are not sufficiently precise to predict optimal tax rates without large confidence intervals.

Because of Lesson 1, optimal tax theory is most useful for studying *qualitative* properties of desirable tax systems. For example, if wage distributions change over time, tax theory can be applied to determine the direction in which income taxes should change. For example, if there is evidence that globalisation and/or technological progress tend to improve the earnings prospects of some groups in the population more than those of other groups, optimal tax theory should be used to study the policy consequences.

Complementary to the normative theoretical approach to taxation, there is also an extensive literature about policy simulations. That literature relies on rich structural models of household decisions that are estimated using micro data (e.g., Hoynes, 1996; Keane and Moffitt, 1998; Blundell et al., 2000; Flood et al., 2004). The models can be used for simulating the household responses to tax reforms and for evaluating the welfare consequences of specific policies, whereas an optimization over the full policy space is typically numerically infeasible. Relatedly, Sørensen (2010) estimates the deadweight losses of several tax instruments in Sweden.

Lesson 2: Except for health-promoting benefits (e.g., *friskvårdsbidrag*), there is no evidence against treating all types of labour incomes (wages, bonuses, other pecuniary benefits) symmetrically for tax purposes.

Typically, optimal tax theory considers only one abstract type of labour income. There is hardly any distinction between wages, bonuses and other types of pecuniary benefits. Hence, from the standard perspective of optimal tax theory, there is no evidence against treating all types of labour incomes symmetrically.

Health-promoting benefits constitute an exception to the rule of symmetric treatment. It is advisable to tax those benefits at lower rates than regular incomes, because healthy individuals are likely to cause lower medical costs, retire later, miss fewer work days due to sickness, and so on. All these mechanisms generate positive externalities in the form of cost savings for the public budget.

5.2. Taxation of capital incomes (including property/real estate taxation and corporate taxation)

Lesson 3: There is no scientific consensus on the main determinants of capital income taxes, nor on the optimal magnitude of capital income taxation.

Optimal tax theory presents several reasons why capital incomes should be taxed. For example, capital income taxation is advisable if it is difficult to distinguish between labour incomes and capital incomes. Credit market imperfections and incentive concerns in models with dynamic uncertainty provide further justifications to tax capital incomes. At the same time, there are influential theoretical results arguing that capital incomes should not be taxed at all.

Lesson 4: There is no evidence against treating all types of capital incomes symmetrically for tax purposes. In particular, property taxes on real estate should match the tax burden on imputed rents if those rents were classified as capital incomes.

Perhaps because of the missing consensus regarding the most relevant general mechanisms, little effort has been invested in studying the tax implications of different types of capital incomes (bonds, stocks, property gains, etc.). Therefore, there is no conclusive evidence against the principle of uniformity. In one of the few studies of differentiated capital goods, Auerbach (1989) finds that a uniform taxation of capital goods is close to optimal.

Lesson 5: Corporate income taxes should be low. Policy makers should pay attention to global trends in corporate taxation.

Optimal tax theory presents two rationales against corporate income taxation. First, corporate taxation ultimately results in a tax on capital incomes at the shareholder level. In the optimal tax literature, except for the principle that economic rents (profits from non-produced inputs such as land, natural resources, market power) should be taxed, there is no widely accepted argument that would give corporate taxation an advantage over capital income taxation at the personal level. Second, corporate income taxation increases the tax burden on the returns to corporate investment (relative to non-corporate forms of investment), possibly resulting in productive inefficiency.

From a more practical perspective, it is hard to overlook the worldwide trend towards lower corporate tax rates (Figure 5). To the extent that there is tax competition across countries, policy makers should take this trend into account. There might be an increased global pressure towards further reductions of corporate tax rates in the coming years.

5.3. Taxation of commodities (value added taxes)

Lesson 6: A uniform VAT is advisable. Any remaining exceptions should be abolished and income taxes and transfers adjusted to compensate households for the higher tax burden.

Optimal tax theory suggests that redistribution is best done through income taxes and transfers, not through preferential VAT rates for specific classes of goods. Although Sweden has made some efforts towards establishing a largely uniform VAT system, exceptions remain for food, travel, restaurants and publications, among other things. Scrapping these exceptions is advisable. However, households should be compensated for the higher tax burden by means of reduced labour income taxes and increased transfers to needy households.

It is difficult to estimate the precise welfare gain from a more uniform VAT system, but findings from the *Mirrlees review* for the United Kingdom suggest that they could be substantial. Specifically, the authors argue that:

“(...) ending all current zero and reduced rates (except for housing and exports) while increasing all means-tested benefit and tax credit rates by 15% would leave the poorest 30% of the population better off, on average, and raise £11 billion that could be used to help them further or for some other purpose.” (Crawford et al., 2010, Mirrlees review, p.277)

Although the numbers might look different for Sweden, these calculations suggest that uniform VAT systems could yield large welfare gains in practice.

Optimal tax theory also concludes that goods and services enhancing an individual's earnings capability (e.g., job-related books, digital devices usable for telework, time-saving household-related services) should be favoured by the tax system. However, this conclusion does not necessarily mean that the VAT should be reduced for such items. Because those goods and services can also be consumed by individuals outside of the labour force (e.g., pensioners), it seems sensible to make those items cheaper through special provisions in the income tax system. See Section 5.5 for further discussion.

5.4. The need to correct for external effects (environmental/climate taxes, health corrective taxes)

Lesson 7: To correct for negative social effects, there should be taxes on environmentally harmful activities, alcohol and tobacco. (Possibly also on unhealthy foods and drinks.) Policy makers should seek up-to-date estimations of the external costs when setting the rates for these taxes.

Optimal tax theory recommends corrective taxes on activities or goods that impose costs on third parties. Environmental damage constitutes a prime example because pollution and climate change affect society as a whole. Alcohol and tobacco are further important

examples because their consumption has negative consequences for others (car accidents caused by drunken drivers, health risks from passive smoking, etc.) and for the consumer's health. Given that medical expenses are shared by society, any health impact will affect the public budget. Moreover, unhealthy workers tend to be less successful in the workplace. Hence, they earn reduced incomes and pay lower taxes, again affecting the public budget. Along the same lines, a corrective taxation can generally be advisable for any form of unhealthy behaviour. Indeed, several countries recently experimented with taxes on fat foods (Denmark, India) and soft drinks (France, Norway, Mexico, United States).

To determine the appropriate rate of corrective taxation, it is crucial to have reliable estimates of the social costs. Such estimations are generally difficult, because external effects can be long-lasting and uncertain (in the case of climate change) and perfect experiments to identify causal impacts in those contexts do not exist. Nonetheless, academic research in economics, medicine and climatology offers a range of viable approaches to estimate some of the most relevant types of social costs. Where suitable estimates are missing, policy makers should commission new research on the topic.

5.5. The Swedish tax reductions (*jobbskatteavdraget*, *RUT*, *ROT*)

From 2007, the introduction of *jobbskatteavdraget* changed the taxation of labour incomes in Sweden. *Jobbskatteavdraget* constitutes a non-refundable earned income tax credit that reduces the average and the marginal taxes for lower earners. An important feature of the Swedish tax credit (in contrast to tax credits in many other countries) is that, initially, it did not phase out for higher incomes. Therefore, all earners faced lower average tax rates when the credit was introduced. A recently enacted phase out of the credit has reversed this effect and increased the tax burden on higher earners.

Overall, the findings from optimal tax theory are too general to imply any straightforward lessons for this particular set of tax reforms. Although it is possible to numerically simulate optimal tax systems and compare them to the situation before and after the reforms, given the imperfect empirical knowledge regarding the behavioural responses to taxation and the social preferences for redistribution, it seems unlikely that such simulations will generate very tight predictions. An alternative approach to evaluating the Swedish tax credit would be to resort to purely empirical methods. Such an approach is not well suited to answer normative questions but may uncover changes in observable variables (in particular, labour supply) induced by the reform. Unfortunately, empirically evaluating the Swedish tax credit is a problematic task, because the credit applies in the same way to all individuals in the labour force. Therefore, it is impossible to apply credible quasi-experimental evaluation methods (Edmark et al., 2012).

Lesson 8: Household-related services, job-related expenses (travel, commuting, clothing, equipment, etc.) and human capital investments should be favoured by the tax system. In particular, *RUT* and *ROT* reductions are generally advisable.

Optimal tax theory suggests that the tax system should favour expenses enhancing an individual's earnings potential. This recommendation is motivated by the idea that successful earners pay higher labour income taxes, resulting in a gain for society. Three broad classes of expenditures are particularly relevant. First, there are human capital investments (job-related books and magazines, professional development courses, mentoring services, educational expenses, etc.). Such investments can improve an individual's career prospects and raise future earnings. Second, individuals may need to commute in order to find a job that ideally suits their interests and qualifications. Therefore, commuting expenses (as well as moving expenses) can enable workers to find well-paid jobs. Similarly, some jobs may require specific clothing or equipment. Third, there are household-related services that replace the recipient's engagement in non-market work. For example, a baby sitter picking up children from school can help parents work full time rather than part time. A professional house cleaner can enable households to work longer hours, and so on. Therefore, tax reductions for household-related services are generally advisable. Contrasting with the Swedish system of *RUT* and *ROT* reductions, there is no theoretical justification to impose tight limits on those reductions. Moreover, it seems natural to tie the tax reductions to the personal marginal tax rate rather than having a uniform reduction rate as in the Swedish system.

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During the work on this report, I have greatly benefited from numerous constructive comments by Spencer Bastani, Robert Boije and Anna Brink. Christina Lönnblad provided excellent proofreading and editing services.

Tables and figures

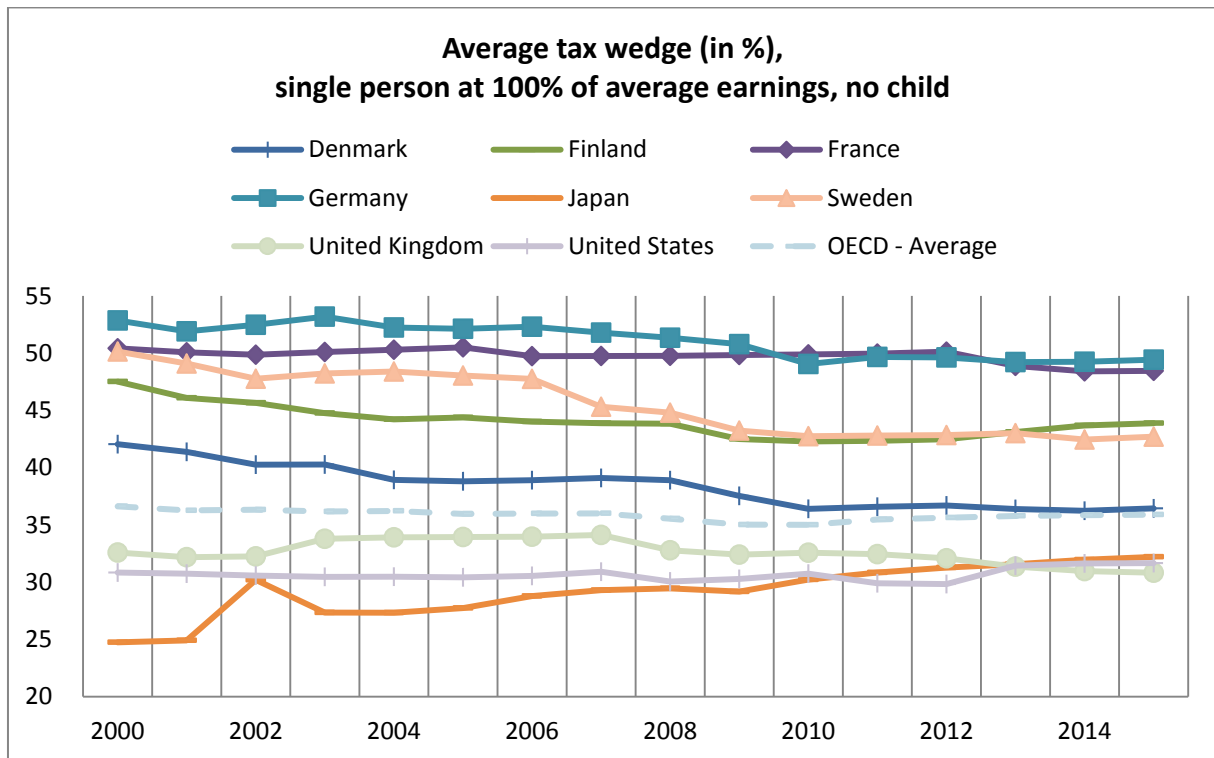


Figure 1: Average tax wedge (combined burden of income taxation, employee and employer social security contributions net of cash benefits). Source: OECD.

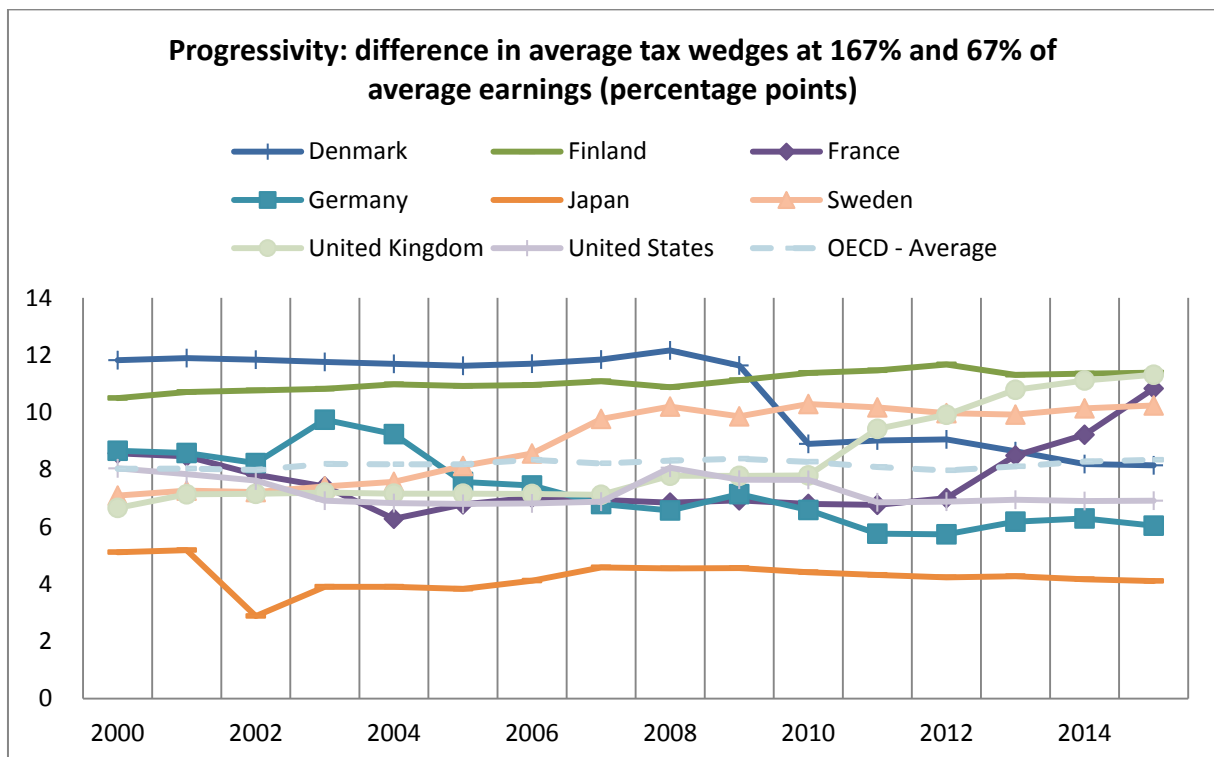


Figure 2: Tax progressivity. Source: OECD.

Top marginal tax rate, personal income tax (in %)			
	2015	2000	Change
Denmark	55.8	53.7	+2.1
Finland	49.1	52.6	-3.5
France	54.0	40.5	+13.5
Germany	47.5	53.8	-6.3
Japan	55.7	45.5	+10.2
Sweden	57.0	55.4	+1.6
United Kingdom	45.0	40.0	+5.0
United States	46.3	46.5	-0.3
OECD average	42.0	44.0	-2.0

Table 1: Top marginal tax rates. Source: OECD.

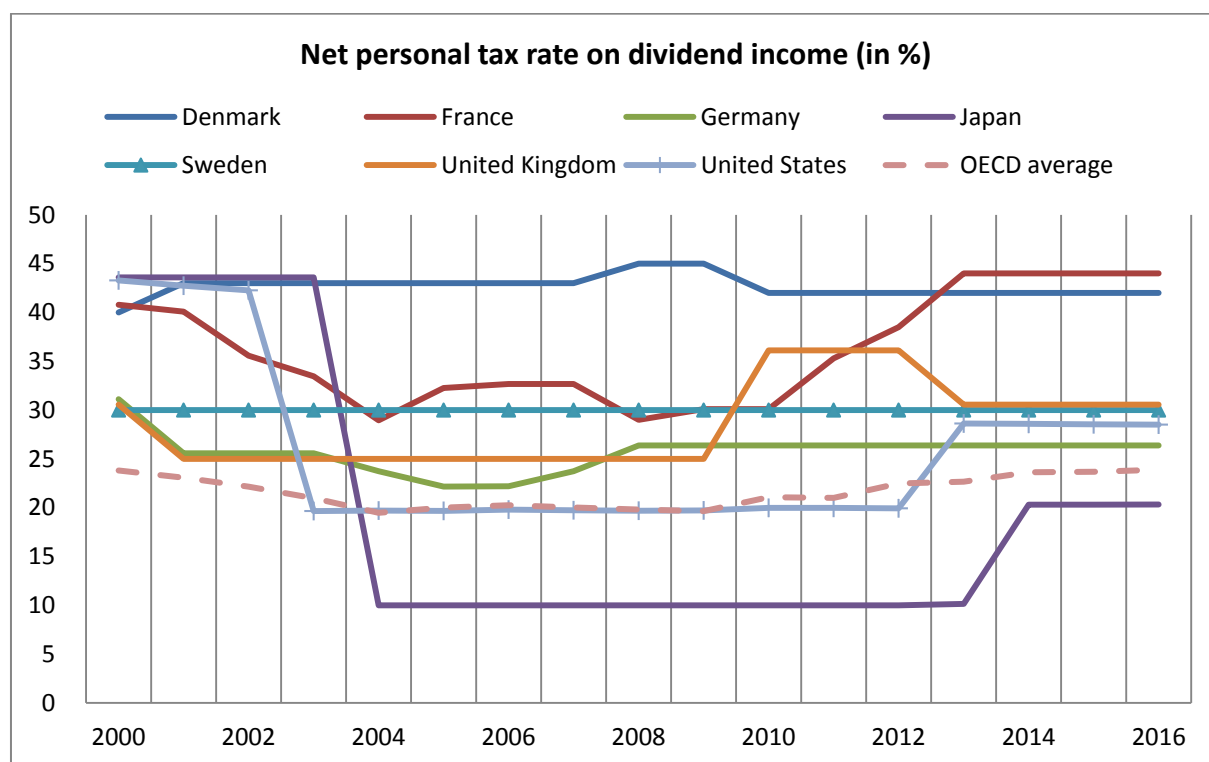


Figure 3: Net personal tax rate on dividend incomes. Source: OECD.

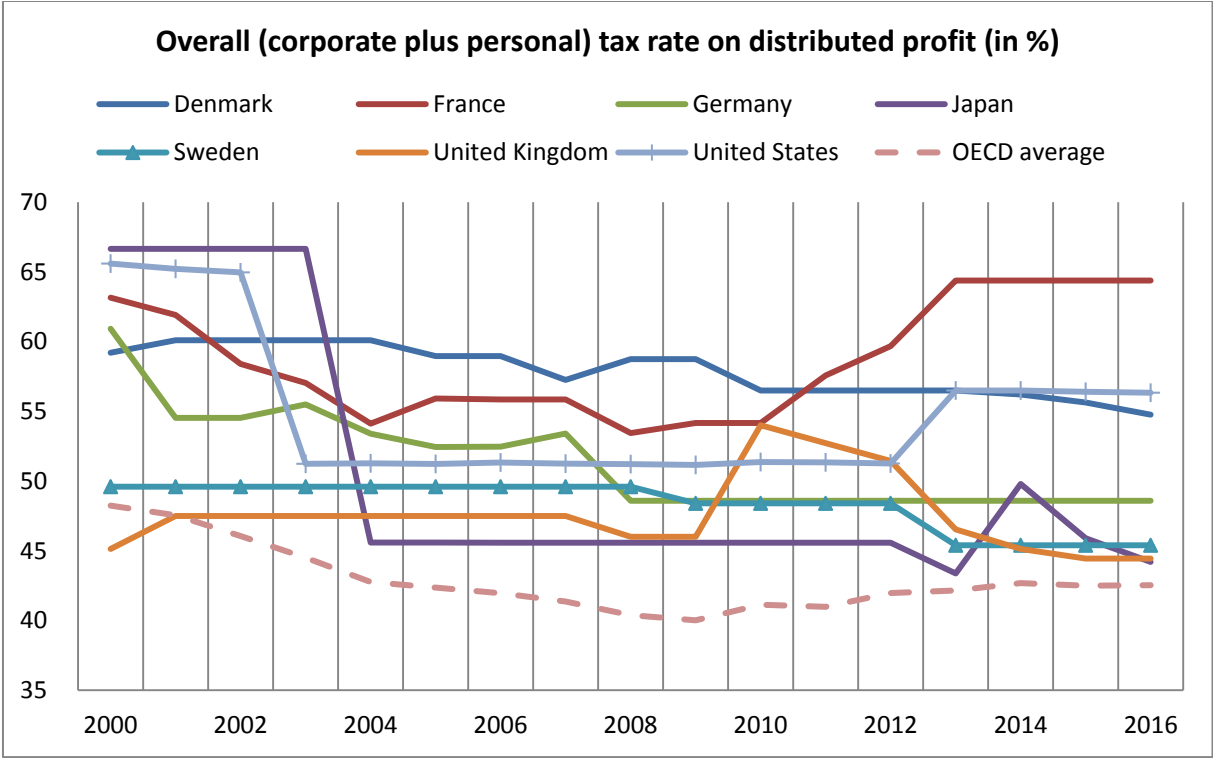


Figure 4: Overall tax rate on distributed profit. Source: OECD.

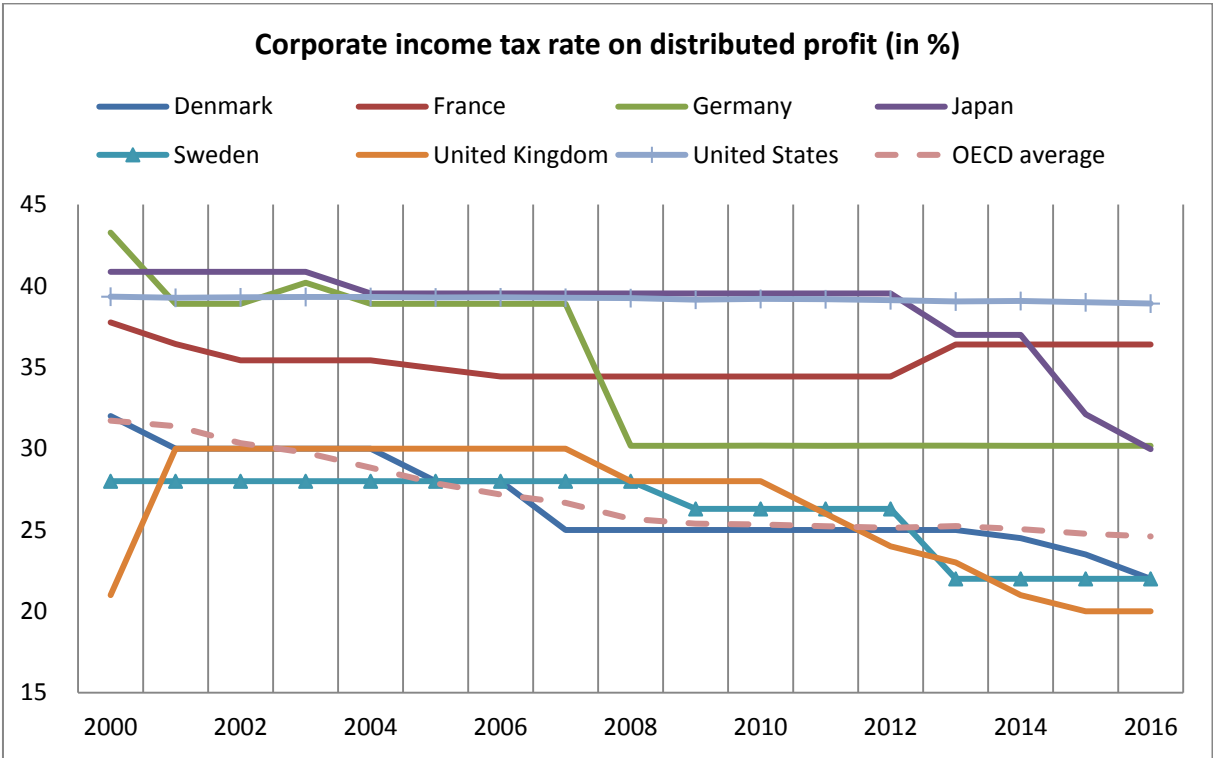


Figure 5: Corporate income tax rate on distributed profit. Source: OECD.

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