

# How Should Consumption Be Taxed?

Spencer Bastani\*

Sebastian Koehne†

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## Abstract

We review the theoretical justification of consumption taxes in advanced economies, providing a systematic overview of the vast public finance literature exploring how goods and services should be taxed. Our discussion focuses on both the determinants of the optimal level of consumption taxation in relation to other taxes, as well as the optimal differentiation of taxes across goods and services. We blend classical public finance results, recent developments in the optimal tax literature, as well as practical considerations. The purpose is to provide guidance to academics and policymakers about the key trade-offs in consumption taxation as well as point out important areas where more research is needed.

**Keywords:** taxation, consumption, commodity, labor, capital, wealth

**JEL codes:** H21, H24

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\*Institute for Evaluation of Labour Market and Education Policy (IFAU); Research Institute for Industrial Economics (IFN); Uppsala Center for Fiscal Studies (UCFS); Uppsala Center for Labor Studies (UCLS); CESifo, Germany. E-mail: [spencer.bastani@ifau.uu.se](mailto:spencer.bastani@ifau.uu.se).

†Kiel University, Germany; CESifo, Germany. E-mail: [koehne@economics.uni-kiel.de](mailto:koehne@economics.uni-kiel.de)

# 1 Introduction

In this paper, we review the theoretical justification of consumption taxes in advanced economies, providing a systematic overview of the vast public finance literature exploring how goods and services should be taxed. We acknowledge that the relevant literature is based on a large number of different models and assumptions, making it a difficult terrain for academics and policymakers to navigate. Moreover, there are few discussions of the the basic principles behind consumption taxation, and what the economic consequences are of changing the relative importance of consumption taxes and other taxes in the tax system. The purpose of this paper is to fill those gaps. Our discussion blends classical public finance results, recent developments in the optimal tax literature, as well as practical considerations.<sup>1</sup>

Considering the different forms of consumption taxation that exist in practice, our paper focuses on two natural policy questions: (i) How should consumption be taxed in relation to other tax bases such as income, capital or wealth? and (ii) How should consumption taxes be differentiated across goods and services? These two overarching questions will guide our discussion. Regarding the issue of tax differentiation, it should be noted that differential tax rates can be created in various ways such as, for instance, by means of excise taxes, reductions or exemptions within the VAT system, or by deduction rules in the income tax code (e.g., for child care expenses, household services or owner-occupied housing). Our discussion of tax differentiation will focus on the general reasoning behind any form of differentiation—without taking a strong stance on specific implementations of differential rates.<sup>2</sup>

Regarding the optimal level of consumption taxation, it is sometimes claimed that if consumption taxes were raised and taxes on labor income were lowered, the reform would stimulate labor supply. We consider this to be a weak argument for consumption taxation, since the purpose of earning an income is to consume, either today or in the future. However, despite many similarities, we demonstrate that consumption is a broader tax base than labor income, as it is financed not only by taxed labor income, but also by wealth and undeclared income. Moreover, taxable consumption arises also in the context of international tourism and cross-border shopping.

Critics of consumption taxation argue that it is regressive, given that low-income individuals consume a larger share of their income.<sup>3</sup> This is certainly a valid objection against relying

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<sup>1</sup>This paper builds in part on the Swedish policy reports by [Bastani \(2021, 2022\)](#).

<sup>2</sup>In some cases, one of those implementations appears to be particularly natural. For example, if the government would like to reduce environmentally harmful consumption, it seems straightforward to use an excise tax where the tax burden is directly tied to the consumed quantity, rather than a tax which is based on the value of sales (price times quantity), since it is usually the consumed quantity that causes the environmental damage. As an additional example, if the government would like to subsidize child care in order to facilitate labor supply, providing the subsidy through income tax deductions or tax credits means that the government can fine-tune its effect to particularly targeted households.

<sup>3</sup>Undesired regressivity may be one reason why countries that rely substantially on consumption taxation have preferential tax rates for necessities such as food or medicine. Such reductions are, however, inefficient because distributional considerations can be more precisely addressed using income taxation and directed transfers to households. If distributional concerns are approached in this way, distorted competition and distorted con-

excessively on consumption taxation. Yet, in practice, consumption taxes are always combined with many other modes of taxation, and it is the distributional profile of the tax system as a whole that matters. In addition, we present two distributional arguments for consumption taxation. First, a tax change from labor to consumption increases the tax revenue from labor income that is re-classified as leniently taxed capital income.<sup>4</sup> Second, a tax change from labor to consumption increases the taxation of excess returns to capital, which is desirable on distributional grounds provided that individuals with a higher earnings ability yield higher returns on their investments.<sup>5</sup> Overall, we conclude that there is a convincing and manifold theoretical justification for consumption taxation. Finding the appropriate level of consumption taxation, however, will require new quantitative advances that assess the relevance of those theoretical mechanisms.

Regarding the optimal differentiation of consumption taxes, two canonical results in public finance by [Atkinson and Stiglitz \(1976\)](#) and [Diamond and Mirrlees \(1971\)](#) provide seminal starting points. Taken together, they recommend that all goods and services should be subject to the same tax rate in order to avoid tax-driven distortions in consumption and production decisions. We argue that several practical considerations strengthen this view. First, uniform tax rates are less susceptible to pressure from lobbying groups. Second, uniform rates are compatible with horizontal equity principles, since they avoid redistribution across individuals with identical income but different consumption tastes. Third, uniform rates are administratively parsimonious and prevent delineation problems.

However, we highlight two broad areas where differentiated consumption taxation is motivated. The first area is, quite naturally, consumption that causes negative externalities or internalities. Typical examples are goods that have adverse effects on the environment or individual health, such as fossil fuels, alcoholic drinks, tobacco products, or sugary foods and drinks. Here, unit taxes are useful to improve economic efficiency by integrating the social impact of consumption into the final prices. The taxes should be directed at the underlying environmental or health problem and be levied at levels that are motivated by the caused damages. They should not be used as general instruments to raise tax revenue.

The second area of differentiation concerns goods and services whose demand depends on labor supply, such as child care and household services. Subsidies to such services can enable redistribution at a lower efficiency cost by mitigating the distortionary effect of high marginal income tax rates. At the same time, such subsidies affect the choice of individuals between carrying out these services themselves and purchasing them in the market, which increases the

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sumption and production decisions are avoided. Adding to these issues is the fact that the distributional effects of differentiated consumption taxes are notoriously difficult to quantify, as they depend on how firms adjust their prices in response to the taxes.

<sup>4</sup>If the change involves reductions of labor income tax rates for high earners, it also reduces the incentive for cross-base income shifting.

<sup>5</sup>The change can also be motivated on efficiency grounds if excess returns reflect rent seeking rather than hard work and careful investment. However, it should also be noted that excess returns provide important incentives for risky investments and entrepreneurship that may stimulate economic growth.

incentive to work in the market relative to the household sector and contributes to an increased specialization in the economy.

As will be illustrated below, consumption taxes are quantitatively very important for the tax revenues of advanced economies. Nonetheless, the research literature discussing the theoretical principles behind them is seldom surveyed.<sup>6</sup> Here we mention a few notable exceptions. As part of the Mirrlees Review (Mirrlees et al., 2011), Crawford et al. (2010) summarize the public finance literature to derive policy recommendations for value added taxes and excise duties on alcohol and tobacco for the United Kingdom. Cnossen and Jacobs (2020) produce a volume in a similar spirit for the Netherlands. Jacobs (2013) and Boadway and Cuff (2022) survey a broad range of topics in optimal taxation and apply the theoretical insights to various policy questions concerning the taxation of labor incomes, capital incomes, pensions and consumption. Moreover, several surveys of the public finance literature focus on the taxation of labor and capital income (Mankiw et al., 2009; Banks and Diamond, 2010; Diamond and Saez, 2011; Bastani and Waldenström, 2020; Kaplow, 2022).

The work most closely related to ours is by Christiansen and Smith (2021) who provide an in-depth textbook treatment of the economic principles behind commodity taxation, focusing in particular on economic aspects of the VAT, financial services, and international aspects of indirect taxation. In comparison to their work, we place less emphasis on the aforementioned issues and instead focus more on the relation between consumption taxation and capital taxation (and the implied taxation of excess returns inherent in consumption taxation), subsidies to child care and household services, and the implications of wealth differences and heterogeneous preferences, among other things. We therefore view our work as complementary.

The paper is organized as follows. Section 2 briefly summarizes the practical relevance of consumption taxation. Section 3 addresses the optimal level of consumption taxes relative to other forms of taxation. Then, we turn to tax differentiation. Section 4 presents arguments for taxing consumption at a uniform rate. Section 5 discusses cases where differentiated taxes on consumption may be warranted. Section 6 concludes and suggests some areas for future research.

## 2 Consumption taxation in practice

Consumption is generally one of the most important tax bases throughout the world (Figure 1). In the 148 countries covered in the UNU-WIDER Government Revenue Dataset, consumption taxes raised on average 9.2% of GDP in 2019 (UNU-WIDER, 2021). The magnitude of consumption taxation is even higher in the OECD, where it reached 10.8% of GDP in 2019 (OECD, 2022). As the close resemblance of these two numbers indicate, consumption taxation

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<sup>6</sup>In contrast, capital taxation has received substantially more scholarly attention in recent years. Although wealth and capital income play an important role in explaining inequality trends, capital taxes do not raise much revenue, and therefore their role in supporting modern welfare states is limited.

is nowadays pervasive at all stages of development.

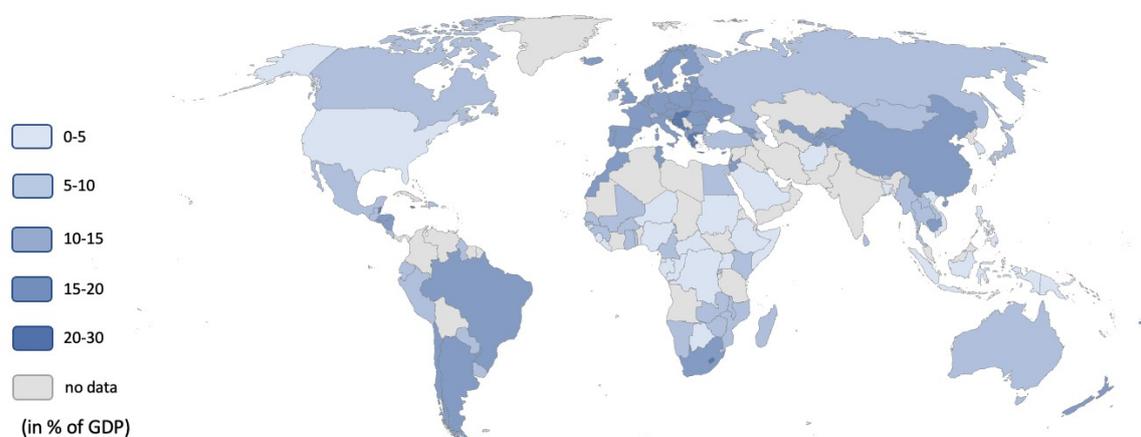


Figure 1: Consumption tax revenues as a share of GDP in 2019. Data source: UNU-WIDER Government Revenue Dataset (UNU-WIDER, 2021).

In the OECD, consumption taxes constitute the largest public revenue source and account for approximately one third of total tax revenues (Figure 2). However, in line with most forms of taxation, there are notable differences across countries. Chile, Hungary, Latvia and Estonia are the OECD countries rely most heavily on consumption taxation and raise more than 40% of their tax revenue from this source (OECD, 2022). The United States, Switzerland and Japan are at the opposite end of the spectrum and raise less than 20% of the tax revenue from consumption taxation (OECD, 2022).

Consumption taxation typically consists of various layers. The major form of consumption taxation in most OECD countries is the value added tax (VAT)—and a sales tax in the United States. Both types of taxes are broad-based and target goods and services consumed by households.<sup>7</sup> Beyond general consumption taxes, tax authorities levy additional taxes on specific goods, often referred to as excise taxes. Goods that are commonly covered by specific taxes include alcoholic drinks, tobacco products, fossil fuels, vehicles and, more recently, foods and drinks with a high content of sugar or fat. Historically, such excise duties accounted for the largest share of consumption tax revenues. Nowadays, however, general consumption taxation in the form of the VAT has become dominant and raises more than twice as much revenue as specific taxes; see Figure 2.

While the move towards the VAT largely has been uniform (apart from in the United States) and included 170 countries as of 2020 (OECD, 2020), the rate of VAT varies substantially across countries.<sup>8</sup> The standard rate of the VAT ranges from low levels of 5% in Canada and 7.7% in Switzerland all the way up to 25% in Denmark, Sweden and Norway, and even 27%

<sup>7</sup>Sales taxes and value added taxes differ importantly in their implementation—value added taxes are assessed at each stage of the production process, whereas sales taxes are imposed only at the retail level. The approaches thus vary in their administrative complexity and their scope for tax evasion (e.g., OECD, 2020).

<sup>8</sup>The United States is the only OECD country without a VAT and employs a sub-national sales tax instead.

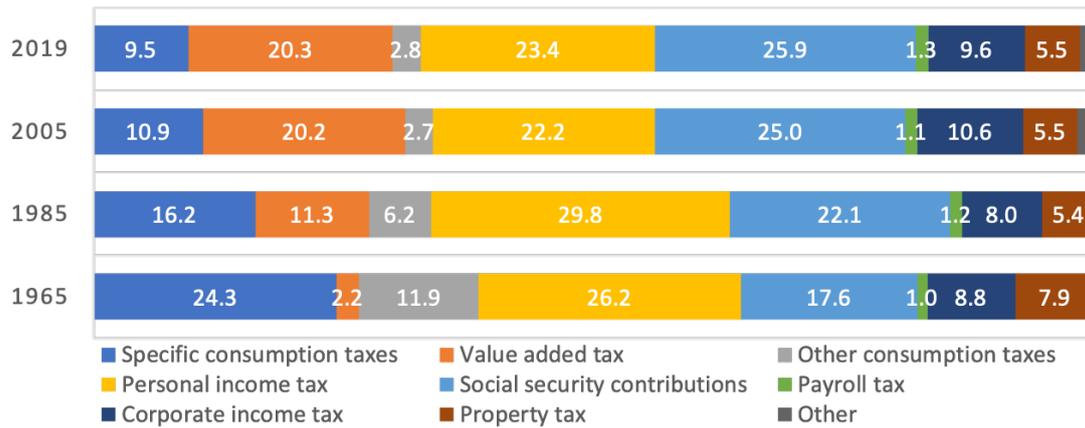


Figure 2: Tax structures as a percentage of total taxation, 1965–2019, OECD average. Data source: OECD (2022). Notes: *Specific consumption taxes* are defined in line with the the OECD classification 5120 and contain in particular excise taxes, customs, import duties, and taxes on specific services.

in Hungary. Most countries employ reduced VAT rates for selected goods and services such as necessities (some foods and drinks, housing, medicine, health care, etc.) and a diverse range of other goods and services including, for example, transport, newspapers, cultural products, hospitality services and agricultural inputs. The levels of the reductions and the types of goods that qualify for them once more vary strongly across countries (OECD, 2020).

### 3 Optimal level of consumption taxation

When discussing consumption taxation, it is useful to separate between the general *level* of consumption taxes (relative to other taxes) and the extent to which taxes on goods and services should be differentiated. In this section, we focus on the first issue and explore the key benefits of consumption taxes relative to taxes on income. We address the advantages and disadvantages of differentiated tax rates in Sections 4 and 5 further below.

We demonstrate that consumption taxes have many similarities with income taxes. The simple reason is that what is earned will sooner or later be consumed. Therefore, both labor and income taxes create comparable disincentives to work, invest in education, become an entrepreneur, et cetera. Yet, some important differences emerge. In particular, consumption taxes reap distributional gains by imposing an extra burden on wealthy individuals, individuals earning excess returns to capital and individuals benefiting from income shifting opportunities. Moreover, consumption taxes may be desirable from a tax enforcement perspective, provided that non-declared income is used to finance domestic consumption. On the other hand, consumption taxes are typically restricted to be proportional, whereas income is more easily taxed in a progressive way. Overall, income and consumption taxes should thus both be strong pillars of the tax system.

### 3.1 Consumption taxation and labor income taxation

An often expressed view is that a stronger reliance on consumption taxation (in exchange for a reduced taxation of labor income) induces individuals to increase their labor supply. In its generality, this view is incorrect, since the purpose of earning an income is to consume it, either today or tomorrow.

The simplest way to illustrate the equivalence between labor income taxation and consumption taxation is to consider a world with two consumption goods  $x_1$  and  $x_2$  with prices  $p_1$  and  $p_2$  and constant marginal costs of production. For an individual with income  $y$ , the budget constraint is:

$$p_1x_1 + p_2x_2 = y. \quad (1)$$

Suppose the government introduces a uniform tax on the value of the consumption goods, a so-called *ad-valorem* tax, with tax rate  $t_c$ . The tax implies that the expenditure on the left-hand side of the budget constraint is multiplied by  $(1 + t_c)$ . An equivalent condition is obtained if the right-hand side of the constraint is instead divided by  $(1 + t_c)$ , i.e.,

$$(1 + t_c)(p_1x_1 + p_2x_2) = y \quad \iff \quad (p_1x_1 + p_2x_2) = (1 - t_y)y, \quad (2)$$

where  $t_y = 1 - 1/(1 + t_c)$ . Hence, a proportional consumption tax is mathematically equivalent to a proportional tax on labor income.<sup>9</sup>

The equivalence between labor income taxation and consumption taxation can be broken if individuals for some reason consider future consumption expenditures less relevant. For example, if individuals are myopic and neglect future taxes, a shift to consumption taxation will mask some of the tax burden and may boost the perceived returns to work. In that case, a move towards consumption taxation may stimulate labor supply.

A related issue is that unexpected tax changes are, by construction, not harmful for past labor supplies. Thus, tax changes affect present incomes differently from past ones. We outline the consequences of this distinction in Section 3.2 below.

### 3.2 Consumption taxation as an implicit wealth tax

A popular argument for consumption taxation is that consumption is a broad tax base, since it can be financed not only by income from labor and capital, but also by depleting the wealth of the consumer.

To take up this argument, suppose that the consumer owns a wealth stock  $W$  in addition to her labor income  $y$ . The wealth stock may be interpreted as an unexpected inheritance or as an

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<sup>9</sup>This example compares proportional consumption taxes with proportional labor income taxes. An important practical difference is that taxes on consumption are in most cases proportional, whereas taxes on income are often nonlinear (progressive). We discuss distributional aspects in Section 3.7.

income that has been accumulated before the introduction of the tax system, and therefore can be considered as exogenous. In this case, the budget constraint (1) takes the form:

$$p_1x_1 + p_2x_2 = y + W. \quad (3)$$

In equation (3), taxes on labor income and consumption are no longer equivalent, since part of the consumption is financed by the wealth  $W$ . Instead, proportional consumption taxation is equivalent to a proportional tax on both income and wealth.

The fact that consumption taxation implies an implicit tax on wealth can be regarded as desirable as it may lead to reduced wealth inequality. Moreover, by shifting the tax burden away from present incomes towards past incomes (wealth), consumption taxation will stimulate the incentive to work, provided that the tax reform is not anticipated. However, it should be noted that such tax reforms hit individuals very differently depending on their position in the life-cycle. An unexpected shift towards consumption taxation is mainly a tax on the older generation at the benefit of the younger generation.

### 3.3 Consumption taxation as a tax on excess returns

Next, we consider consumption taxation with an explicit dynamic perspective and relate consumption taxes to taxes on capital income. Once again, we consider an individual with a life-time labor income of  $y$ . Rather than choosing between different consumption goods at a given point in time, the problem is now how to distribute consumption across time. For simplicity, we suppose that there are two periods of life and that the individual finances her consumption in both periods with the labor income earned in the first period. We also assume that there is only one consumption good in each period and that the producer price of consumption is equal to unity.

For a first benchmark, we assume that the individual can save and borrow at the risk-free rate  $r$ , which is also the rate at which the government can lend and borrow. Then, the intertemporal budget constraint of the individual is:

$$c_1 + \frac{c_2}{1+r} = y, \quad (4)$$

where the consumption levels in period 1 and 2 are denoted by  $c_1$  and  $c_2$ , respectively. In (4), the left-hand side is the present (discounted) value of the individual's consumption and the right-hand side is the present value of the individual's resources, equal to the labor income.

Note that (4) is a special case of (1) and, hence, the equivalence between consumption taxation and labor income taxation is maintained. Importantly, consumption taxation corresponds to a pure tax on labor income and leaves the return to savings untaxed. To see this, note that consumption in period 1 equals  $c_1 = y - s$  and consumption in period 2 is given by

$c_2 = (1 + r)s$ , where  $s$  denotes the savings of the individual. Hence, we can rewrite (4) as

$$c_1 + \frac{c_2}{1 + r} = (y - s) + \frac{(1 + r)s}{1 + r} = y. \quad (5)$$

A proportional tax on consumption thus translates into a proportional tax on labor income  $y$  and leaves capital income  $rs$  untaxed. In particular, consumption taxation does not distort how individuals allocate their consumption over the life-cycle, which is often regarded as one of the main advantages of consumption taxation.

The implications of consumption taxation change considerably in the presence of excess returns to capital. The risk-free rate of return  $r$  can be regarded as the compensation an individual requires to postpone consumption, also known as the *normal* rate of return. In practice, this normal rate of return would be approximated by the yield on a government bond. Yet, the capital incomes that are observed in practice reflect much more than the normal return. Realized returns contain both compensation for risk (the expected risk premium) and increased returns as a consequence of information advantages, returns to scale (investing larger amounts typically yields a larger return) and rents (e.g., due to imperfect competition, patents or natural monopolies). The realized returns also reflect differences between expected and actual returns due to stochastic factors beyond control of the individual.

To explore how excess returns affect the implications of consumption taxes, we suppose that the individual in addition to the normal return  $r$  also receives the excess return  $\sigma$ . In this case, first-period consumption is  $c_1 = y - s$  and second-period consumption is  $c_2 = (1 + r + \sigma)s$ . Assuming a proportional tax on consumption with tax rate  $t$  and assuming the government discounts tax revenue with the factor  $1/(1 + r)$ , the present discounted value of tax revenue is

$$R = t \left( c_1 + \frac{c_2}{1 + r} \right) = t(y - s) + \frac{t(1 + r + \sigma)s}{1 + r} = ty + \frac{t\sigma s}{1 + r}. \quad (6)$$

The above equation illustrates that in the presence of excess returns, consumption taxation is no longer equivalent with the taxation of labor income, since a tax on labor income does not tax the excess return  $\sigma$ , whereas a consumption tax does.

The fundamental difference is that labor income taxes are collected in period 1, whereas consumption taxes are only partly collected in period 1 (due to the tax deduction for savings), the rest being collected in period 2. For a consumption tax, the revenue collected in the second period depends on the extent to which the investment technology of the individual differs from that of the government. In the absence of excess returns, there is no such difference since both private agents and the government obtain the common rate of return of  $r$  (which is taxed neither by the labor income tax nor the consumption tax). However, in the presence of excess returns, a difference emerges depending on the discount factor the government applies to the collection of tax revenue in period 2.<sup>10</sup>

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<sup>10</sup>The appropriate rate of return to use has been intensely debated in the literature, see [Ahsan \(1989\)](#), [Ahsan](#)

In the presence of excess returns, consumption taxation is instead equivalent to labor income taxation combined with capital income taxation that admits a tax-free normal rate of return, the latter typically referred to as a *rate-of-return allowance*, RRA.<sup>11</sup> To see this result, note that we can rewrite the tax revenues in (6) as follows:

$$R = ty + \frac{t\sigma s}{1+r} = ty + \frac{t(r+\sigma)s - trs}{1+r}, \quad (7)$$

which illustrates that in the presence of excess returns, a tax on consumption is equivalent to a proportional tax  $t$  on labor income  $y$  and capital income  $(r+\sigma)s$ , combined with a tax credit (RRA) of  $trs$  accruing to the individual in period 2.

The taxation of excess returns inherent in consumption taxation is desirable from an equity point of view as these returns contribute substantially to wealth inequality.<sup>12</sup> The taxation of excess returns can also be motivated on efficiency grounds to the extent that excess returns reflect economic rents. Beyond consumption taxation, excess returns can also serve as a general motivation to tax capital income. For instance, [Gahvari and Micheletto \(2016\)](#) and [Gerritsen et al. \(2020\)](#) show that excess returns motivate a positive capital income tax in the presence of an optimal nonlinear tax on labor income. The main driving force in their models is a positive correlation between unobserved earnings abilities and rates of return. Our discussion above provides a similar argument for the optimality of combining consumption taxes and labor income taxes.

At the same time, excess returns also provide incentives for entrepreneurship and risky investments that are needed for growth and international competitiveness, suggesting that taxes on excess returns should be limited. Finally, while we abstract from motives for taxing the normal return to capital, it should be noted that the academic literature on optimal capital taxation, recently summarized by [Bastani and Waldenström \(2020\)](#), typically recommends that both the normal and the excess return to capital be taxed.<sup>13</sup>

### 3.4 Consumption taxation and cross-base income shifting

An increased reliance on consumption taxation in relation to labor income taxation also has implications for the taxation of entrepreneurs in the context of dual income tax systems. The dual income tax system is flexible as it allows the government to set different tax rates on labor income and capital income. For example, the mobile nature of the capital income tax base (due to international capital mobility) typically justifies a lower tax rate on capital income in relation

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(1990), [Zodrow \(1995\)](#) and [Ahsan and Tsigaris \(1998\)](#). See also [Kaplow \(1994\)](#) and [Gentry and Hubbard \(1997\)](#).

<sup>11</sup>Such systems of taxing capital income are used for placements in the stock market in Norway and for investments in unlisted equity in Finland. A system of taxing capital income with a rate-of-return allowance was also recommended by the Mirrlees Review ([Mirrlees et al., 2011](#)), a recommendation that has recently been reiterated by [Adam and Miller \(2021\)](#).

<sup>12</sup>See e.g., [Fagereng et al. \(2020\)](#).

<sup>13</sup>The same conclusion is reached by [Banks and Diamond \(2010\)](#), one of the expert reports underlying the Mirrlees Review ([Mirrlees et al., 2011](#)).

to labor income.<sup>14</sup> However, such differentiation also invites cross-base income shifting where entrepreneurs re-classify what is essentially labor income, as capital income.<sup>15</sup>

What are the consumption tax implications of income shifting? A lower tax on labor income combined with an increased consumption tax rate implies an increased tax burden on entrepreneurs who finance their consumption through labor earnings transformed into leniently taxed capital income. Such a reform has desirable distributional implications provided those who shift are individuals with low welfare weights. [Bastani and Waldenström \(2021\)](#) present empirical evidence that individuals who engage in income-shifting are disproportionately high-skilled individuals (which are associated with low welfare weights in typical social welfare functions).<sup>16</sup> To the best of our knowledge, this argument for consumption taxation is novel in the academic literature.

### 3.5 Consumption taxation and economic stimulation

Tax reforms often help to stimulate an economy during a crisis. For example, lowering consumption taxes can be a way to increase the consumption in broad parts of the population and thereby stimulate aggregate demand.<sup>17</sup> However, it is unclear how effective consumption tax reductions are given that the firms can respond to such tax changes by adjusting the producer prices. For example, a VAT cut would have no effect on demand if firms refrain from lowering the consumer prices. [Harju et al. \(2018\)](#) and [Benzarti et al. \(2020\)](#) find evidence of such behavior. Given that consumers do not benefit much, VAT cuts mainly constitute transfers to surviving firms, which is not necessarily the most effective policy response in a crisis.

An important aspect is that firms tend to adjust their prices more in response to VAT increases than they do in response to VAT cuts ([Benzarti et al., 2020](#)). Hence, pre-announced tax increases are likely to affect consumers' expectations about future prices. Based on similar reasoning, [Feldstein \(2002\)](#) proposes a pre-announced increase in the consumption tax combined with a pre-announced cut in the labor income tax as a revenue-neutral way to stimulate the economy by inducing individuals to bring forward their purchases of e.g., consumer durables.

A shift from labor income taxation to consumption taxation can also be a way to increase the international competitiveness of a country, in the form of what is sometimes referred to as a fiscal devaluation ([Farhi et al., 2013](#)). By for example lowering payroll taxes and raising the VAT, the wage costs of exporting firms are lowered while at the same time the higher VAT does not affect firms that mainly export goods, since exports are exempt from VAT.

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<sup>14</sup>See [Bastani and Waldenström \(2020\)](#), for example.

<sup>15</sup>For this reason, special income splitting rules are typically required that specify how the income of entrepreneurs should be divided across the labor and capital income tax bases. [Selin and Simula \(2020\)](#) study how the possibility for income shifting affects the design of optimal income taxation.

<sup>16</sup>Simultaneously, the reform reduces the incentives for cross-base income shifting.

<sup>17</sup>For instance, Germany recently introduced a special tax cut in response to the Covid-19 pandemic which temporarily lowered the VAT for six months, from the 1st of July to the 31st of December 2020. The standard rate of VAT was reduced from 19 to 16 percent and the reduced VAT rate was lowered from 7 to 5 percent.

### 3.6 Issues of tax administration

The theoretical result of Section 3.1—that the taxation of all goods and services with the same tax rate is equivalent to the taxation of labor income—does not take into account possible differences in administrative costs of taxing labor and consumption. Although these costs are regarded as important by policymakers and practitioners, they have not attracted much attention in the research literature.

Direct (personal) taxation of income builds on the principle that individuals and firms correctly report information about individuals' labor income and capital income to the tax authority. Consumption taxation, on the other hand, requires that firms correctly collect taxes in connection with the transaction of goods and services that they then submit to the tax authority. Due to these differences in tax collection, the balance between taxes on labor and consumption can play an important role for the administrative costs of the overall tax system and the extent of tax evasion. This is clearly an area with high policy relevance where more research is needed.

An important example is the taxation of non-declared income, such as foreign income. To the extent that foreign income finances consumption domestically, consumption tax revenue is generated. Thus, an increased reliance on consumption taxation may generate more tax revenue for the host country (Boadway et al., 1994). However, Kesselman (1993) argues that those sectors of the economy that evade income taxes also tend to be sectors that circumvent consumption taxation, and therefore the difference between taxes on consumption and labor, from a tax enforcement perspective, should not be exaggerated.<sup>18</sup> Gordon and Nielsen (1997) argue that income and consumption taxes are avoided in different ways and that it is therefore desirable to combine taxes on labor and consumption in the tax system.

### 3.7 Consumption taxation and progressivity

Above we have outlined some important distributional benefits of consumption taxation, namely, that consumption taxes impose an extra burden on 1.) wealthy individuals, 2.) individuals earning excess returns to capital and 3.) individuals exploiting income shifting opportunities. However, our analysis relied on comparing proportional consumption taxes with proportional labor income taxes. In reality, labor income taxes are typically nonlinear (progressive), whereas consumption taxes—for administrative and informational reasons—most often are proportional. Therefore, if broader distributional aspirations are pursued, proportional consumption taxes should be complemented with progressive income taxes.<sup>19</sup>

However, not all redistribution must be carried out through the tax system. Regardless if the government relies on labor, consumption or capital taxes, the expenditure side of the government budget plays an important part in overall redistribution. For example, households with different incomes may benefit to different degrees from publicly provided services. If

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<sup>18</sup>See also Kesselman (1989) and Richter and Boadway (2005).

<sup>19</sup>Moreover, given that low-skilled individuals tend to have lower savings rates, taxes on wealth or capital income are useful supplements. See Diamond and Spinnewijn (2011) and Golosov et al. (2013).

households with higher income are not happy with the quality of certain services provided by the government, they will opt out and purchase these services privately (financed out of post-tax income). Since they pay for the services twice, once through the income tax bill and once again through the private purchase, this arrangement implies an indirect form of redistribution from high-income households to low-income households.

Regarding the distributive power of consumption taxation, it is important to note that, at least in principle, consumption taxes are not restricted to be proportional. Yet, progressive forms of consumption taxation are rather information-demanding.

Consider the case of expenditure taxation. In a nutshell, expenditure taxation can be defined as the taxation of all income that is not saved or invested. As the intertemporal budget-constraint (5) of our simple two-period model demonstrates, it is equivalent to tax the consumption of all goods and services and to tax labor income minus savings in period 1 as well as savings (and its associated return) in period 2. An important property of expenditure taxation is that it is not based on anonymous transactions, but tied to the identity of the taxpayer in the same way as labor and capital income taxation. For this reason, expenditure taxation is often seen as a potential way to implement a progressive consumption tax. A strong impediment to expenditure taxation is that the savings of the individual must be observed with sufficient precision. The fact that the tax base is defined as income minus savings implies that individuals have incentives not only to misreport their labor income, but also to exaggerate their savings in order to minimize the tax burden. For practical reasons, deductions for savings need to be given only for forms of savings where the scope for control is sufficiently large, which introduces distortions in the savings portfolios of individuals. Given these severe complications, it is perhaps not surprising that expenditure taxes have not been permanently adopted in any country that we know of.<sup>20</sup>

It should be mentioned that progressive consumption taxes are attracting renewed interest in recent years in light of increasing wealth inequality (see Frank, 2016, for example). Moreover, expenditure taxes have the attractive feature that consumption is taxed irrespective if it occurs domestically or abroad. On the other hand, expenditure taxes can lead to losses in tax revenue if individuals accumulate savings domestically during their working life and then move abroad during retirement.

Progressive consumption taxes are more easily implemented when they are restricted to goods that are purchased in non-anonymous markets, such as housing and land, utilities tied to a property (such as electricity and water) or insurance contracts. Since most goods and services are purchased anonymously, the distributive implications of such taxes are however limited. Once the transactions become anonymous, tax arbitrage voids nonlinear consumption taxation. If there were a progressive tax on tobacco, for example, a smoker with a high annual consumption of tobacco who faces a high marginal tax rate on tobacco could ask a friend with

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<sup>20</sup>Some elements of an expenditure tax can be obtained by introducing a deduction for retirement savings in the tax code.

a low annual consumption to carry out the purchase in his/her place, thereby circumventing the high marginal tax rate. Combating such behavior is prohibitively complicated and costly for the tax authority.<sup>21</sup>

## 4 Arguments for a uniform consumption tax

Orthogonal to the overall level of consumption taxation is the question whether and how consumption taxes should be differentiated across goods (and services). We begin by discussing arguments in favor of a uniform taxation. In particular, based on seminal theoretical results by [Atkinson and Stiglitz \(1976\)](#) and [Diamond and Mirrlees \(1971\)](#), we argue that a differential taxation of consumption creates distortions in consumption and production without generally enhancing the feasibility of redistribution. We also argue that uniform taxes can limit wasteful lobbying efforts, strengthen horizontal tax equity and reduce delineation problems.

### 4.1 Undistorted consumption decisions

The most straightforward argument in favor of a uniform tax rate on all consumption goods and services is that differential taxation causes efficiency losses as individuals do not purchase the goods and services they prefer the most, but also take taxes into account. Notably, distorted consumption decisions are not only caused by consumer taxes such as differentiated value added taxes or sales taxes, but also by excise taxes on e.g., alcohol and tobacco. If differential taxation is to be socially desirable, the gains of the differentiated tax structure must exceed the distortions of consumption choices.

Provided that the government has access to progressive (nonlinear) income taxation and can direct transfers to households, differential taxation distorts the consumption profiles without generally enhancing the feasibility of redistribution. Differential consumption taxation should then be avoided, as demonstrated in the seminal contribution of [Atkinson and Stiglitz \(1976\)](#). More precisely, the authors show that in the absence of internalities and externalities (that will be discussed in the next section) *all goods and services should be taxed with the same tax rate* if the following two assumptions are satisfied: (i) the consumption preferences of individuals are unrelated to their capacity to earn income, and, (ii) there is no connection between labor supply and the goods and services that individuals consume.<sup>22</sup> Several remarks are in order. First, in the model of [Atkinson and Stiglitz](#), a uniform taxation of consumption is equivalent to not taxing consumption at all (and adjusting the income taxes appropriately). Second, [Atkinson](#)

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<sup>21</sup>Why are then progressive taxes on labor income feasible? The reason is that the tax authority can rely on third-party information by employers about the income sources of individuals. It is difficult for an individual with a high marginal tax rate to convince his/her employer to transfer part of the labor income to a colleague with a lower marginal tax rate (and to convince the colleague to forward the extra income) as part of a tax avoidance tax scheme.

<sup>22</sup>The first assumption is typically referred to as preference homogeneity and the second assumption is expressed in terms in terms of weak separability between consumption and labor supply.

and Stiglitz analyze consumption taxes that are allowed to be nonlinear. The main result is however unchanged if one restricts attention to linear consumption taxation (see, for example, Edwards et al., 1994; Jacobs and Boadway, 2014). Third, Atkinson and Stiglitz assume that the labor income tax is nonlinear. Deaton (1979) shows a closely related result in a model with linear income taxes under the additional restriction of linear Engel curves for consumption.<sup>23</sup>

There are of course many goods and services that violate the strict assumption of the aforementioned theorem (which will be discussed in the next section). Nonetheless, the central message is that uniform taxation should be the natural starting point when discussing the design of consumption taxes. Importantly, under the assumptions of the theorem, it does not matter how price elastic different goods and services are or to which extent they are consumed by poor or rich households, since uniform taxation is shown to be optimal independent of these measures.<sup>24</sup> Importantly, consumption taxes should not be used to achieve distributional objectives, as it is more efficient to redistribute using the income tax system.<sup>25</sup> An important qualification is, however, that the government needs to be able to freely adjust the income tax paid (or transfer received) at every income level. In real economies, practical and political considerations constrain the degree to which the income tax can be adjusted and thereby to which extent the distributional effects of a consumption tax reform can be neutralized.

## 4.2 Undistorted production decisions

The second argument in favor of a uniform tax on goods and services is production efficiency. Differential taxation easily creates distortions in the production decisions of firms. Before value added taxation was broadly introduced, it was common to have sales taxes that applied to all sales, independently of whether the sales were directed towards firms or final consumers.<sup>26</sup> In such a situation, a differential taxation of goods and services does not only distort consumption choices, but also production decisions. In addition, so-called cascading effects arise when goods are produced in several stages by different firms and the tax is collected at each stage of production—a process that can lead to inefficient tax-driven decisions about in-house production in order to remove the intermediate steps of production.

Modern consumption taxes are often designed in such a way that they do not affect trans-

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<sup>23</sup>See also Boadway and Cuff (2022).

<sup>24</sup>The idea that goods should be taxed inversely to their elasticity of demand originates from the influential Ramsey rule (Ramsey, 1927) for linear commodity taxation. Yet, it is based on unrealistic assumptions (ruling out cross-price effects in demand) and does not take into account distributional considerations. Diamond (1975) extends the Ramsey model to encompass income differences between individuals and shows that inelastic goods should not necessarily be taxed at high rates. Yet, without accounting for the role of nonlinear income taxation, it remained unclear to which extent consumption taxation should contribute to redistribution.

<sup>25</sup>The result can be understood based on the principle that the fundamental restriction on tax policy is information. The government would like to redistribute from individuals with a high earnings ability to individuals with a low earnings ability, but cannot observe these abilities and has to rely on information about income and consumption. Under the given assumptions, the consumption choices of individuals do not reveal anything about their ability. This means that differentiated consumption taxation only introduces distortions in the economy without enhancing redistribution.

<sup>26</sup>Note that tax arbitrage limits the possibility to condition sales taxes on the type of the buyer.

actions between firms. In the case of the valued added tax (VAT), firms apply a proportional tax to their sales, but get compensated for the VAT they pay on their input factors. The VAT is therefore no cost in their business and the tax is pushed forward until it reaches the final consumers. The VAT has the advantage that firms need not record if they sell to firms or consumers. However, the sales tax in the US, while being directed towards consumer sales, does not have the property of production neutrality. Ring (1999) estimates that up to 40 percent of the retail sales tax in the US actually burdens firms.

While in theory, modern implementations of consumption taxes need not affect firm decisions, in practice they do. In the case of the VAT, one important reason are the extensive VAT exemptions present in many European countries. How do these exemptions work? Firms in sectors with VAT exemptions do not impose VAT on their sales, but they are treated as final consumers when they purchase input goods from firms that are subject to VAT.<sup>27</sup> Thus, with a VAT of 20%, all input purchases become 20% more expensive. The VAT becomes a cost in the business that is pushed forward in the form of higher prices, something that is known as *hidden VAT*. The hidden VAT makes goods and services produced by firms in exempt sectors less attractive for firms covered by the VAT as the hidden VAT cannot be deducted from the output VAT. This consequence distorts the production decisions of firms and can induce firms to produce input factors in-house, as this becomes a way of circumventing the VAT on these inputs.<sup>28</sup>

The seminal paper discussing production efficiency in the context of taxation is by Diamond and Mirrlees (1971). They show that uniform taxes (or no taxes at all) are the most efficient approach to tax production inputs. Their result builds on the observation that differential taxes on inputs not only distorts firms' production decisions, but also change the consumer prices and therefore cause distortions in consumption. Imposing uniform taxes on production factors and differentiating the taxes on consumer goods can create the same consumer prices and achieve a Pareto improvement, as the distortions are limited to consumption choices only.

The Diamond–Mirrlees result hinges on two important assumptions. The first assumption is that the pure profits (economic rents) of firms can fully be taxed. The second assumption is that all goods and services that are sold to consumers can be taxed. Both of these assumptions are restrictive in practice.<sup>29</sup>

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<sup>27</sup>The situation is even more complicated due to the fact that some firms have business operations in sectors that are exempt and non-exempt from VAT at the same time. There are also sectors that have a so-called qualified exemptions, which means that they take out 0% VAT on their sales, but still have the right to compensation on the VAT payed on inputs (e.g., the pharmaceutical industry).

<sup>28</sup>Firms that benefit from VAT exemptions are mainly those who sell directly to consumers and have few processing steps in their production, as it allows them to take out lower prices for their goods and services. The VAT exemptions are mainly a disadvantage for firms in the middle of production chains that sell their products to firms subject to VAT, something that can result in higher prices for final consumers, especially if there are many processing steps involved. Therefore, VAT exemptions not only cause distortions in the production decisions of firms, but also spill over to consumer prices causing additional distortions in consumption.

<sup>29</sup>The literature contains also additional violations of the production-efficiency principle. In particular, Naito (1999) studies an economy where low-skilled and high-skilled labor is combined to produce goods in various production sectors. If commodity taxation benefits sectors of the economy that rely more on low-skilled labor,

Regarding the first assumption, [Dasgupta and Stiglitz \(1972\)](#) show that input factors in sectors characterized by imperfect competition or sectors where prices exceed long-run marginal costs (as in the case of natural monopolies) should be taxed at higher tax rates to extract economic rents. Gasoline is an example of such a good. Taxing gasoline distorts production, but it can be a way to tax monopoly rents in the oil industry.

Regarding the second assumption, it is apparent that several consumption goods cannot be taxed for practical reasons or legal constraints. In those cases, taxes on input factors can serve as substitutes for taxes on final goods and services. In this case, the reduced distortions in consumption decisions have to be weighed against the distortions introduced in production. Financial services represent an important example. In the context of the VAT, it is difficult to define the value added pertaining to financial services. When value added taxation is difficult, a sector-specific wage tax can be an alternative. Such a tax would raise the prices of financial services and thereby contribute to a more uniform consumption tax (an efficiency gain). At the same, too few people would be hired in the financial sector, which constitutes an efficiency loss.<sup>30</sup>

Sometimes lower consumption taxes are proposed for certain sectors that hire young individuals or workers with a lower level of education (e.g., restaurants and hotels). At first glance, subsidizing such sectors through the tax system may appear desirable if the subsidies reduce long-term unemployment or bring other gains that follow from a higher employment rate. However, it is not obvious that preferential consumption taxation should be used since there are other policy measures that directly attack the source of the unemployment problem. For example, if unemployment is due to a difference between the productivity of individuals and the wage costs facing firms, a more direct measure would be to reduce wage costs (for example through reduced payroll taxation) or to increase the productivity of individuals through education and training. These sector-neutral approaches to address employment avoid the consumption inefficiencies caused by a differential taxation of consumption.

The overall conclusion is that differential taxes on production factors should generally be avoided as they distort both production decisions and consumption decisions. To the extent that consumption goods may serve as production inputs, this reasoning suggests that uniform consumption taxes are advisable. In special cases, differential taxes on consumption goods or production factors can be warranted when economic rents are difficult to tax.

### **4.3 The political economy of consumption taxation**

The third argument in favor of uniform consumption taxation relates to the political economy of taxation. Uniform taxes make the tax system less susceptible to pressure from special inter-

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and the two types of labor are imperfect substitutes in production, the wages of low-skilled workers increase relative to the wages of high-skilled workers. This general equilibrium effect generates redistribution through the wage distribution rather than through the tax system, and therefore contributes to distributional goals at a low efficiency cost.

<sup>30</sup>Relatedly, financial companies may replace domestic personnel with staff hired abroad.

est groups. Due to inefficiencies in production and consumption, the economic costs of such pressure can be substantial if interest groups succeed in carving out preferential tax rates for special sectors. Moreover, the time and resources that interest groups and politicians spend to create and deal with such pressure represents a pure waste from a societal point of view.

However, despite this pervasive argument, the empirical experience tells us that a uniform taxation of consumption is difficult to uphold. For example, in Sweden, one of the ambitions of the major tax reform in 1991 (also known as the “Tax Reform of the Century” which introduced dual income taxation) was to promote uniform consumption taxation. Yet, it did not take many years until several deviations from uniformity took place; see [Agell et al. \(1995\)](#). A possible explanation of this phenomenon is provided by [de la Feria and Walpole \(2020\)](#), who argue that uniform taxation may be difficult to maintain because it can be viewed as regressive (neglecting that it is the progressivity of the overall tax system that ultimately matters). This misunderstanding may allow special interest groups to obtain tax privileges that claim to increase the amount of redistribution in the economy. Moreover, tax cuts that initially benefit large voter groups tend to easily receive political support if voters neglect the required adjustments of government expenditures or other taxes. Relatedly, consumption tax cuts may be more salient and easier to understand than, for example, changes to the income tax, especially for young voters with less experience of the tax system.

#### **4.4 Avoiding arbitrary redistribution**

The fourth argument against differentiated consumption taxation is that it causes arbitrary and hard-to-measure redistribution across individuals in society. In particular, differential consumption taxes will redistribute across individuals with identical income but different consumption preferences, violating the principle that it is the ability to pay that should guide the design of the tax system. Moreover, since consumption taxes affect wages (and other input prices) throughout the entire production chain via pass-through effects, differential consumption taxes cause indirect gains for workers and stakeholders in some sectors at the expense of others. Individuals who gain do so because they happened to work in the right sectors, rather than being genuinely deserving of a lower tax.

#### **4.5 Administrative simplicity**

Another argument is that differential consumption taxation leads to costly delineation problems. For instance, if a reduced tax rate is applied to recreational services, the question of what should count as a recreational service arises. In most countries with differentiated tax rates, long lists of court cases can be compiled where the delineation pertaining to the application of tax rates have been analyzed. The resources society devotes to classifying different consumption goods for tax purposes represents pure waste that can be avoided by adopting uniform consumption taxation. Moreover, in some cases, the borders between categories have to be drawn in ways

that can cause disagreement between economic actors, potentially leading to frustration and ultimately to reductions in the perceived legitimacy of the tax system.

## 5 Arguments for differentiated consumption taxation

By levying excise taxes and/or differentiated value added or sales taxes, most countries tax at least some goods and services at different rates, and there are sometimes strong economic arguments for doing so. In this section, we discuss the most important arguments in favor of a differential taxation of consumption.

A pervasive justification for tax differentiation exists for goods and services that are associated with externalities or internalities. Here, differential taxes can enhance economic efficiency by integrating neglected costs and benefits in consumer prices and steering consumers away from choices that harm others or their “future selves”. A compelling case for differential taxes can also be made for work-related goods such as education, occupational expenses, child care and other household services.

At least in theory, tax differentiation is also warranted when the consumption preferences are related to the consumer’s ability to earn income or when status goods affect the well-being of other consumers. Yet, the existing empirical evidence in these domains appears too limited to guide actual policy decisions.

### 5.1 Externalities

The most apparent reason for deviating from a uniform taxation of consumption is when specific goods generate positive or negative externalities. Here, we will only briefly discuss the case of externalities, since they represent rather well-understood reasons for differential consumption taxes.

Without government intervention, the prices of goods and services that consumers face will only reflect the direct production costs, but not any external social costs following from their production and consumption. If the external costs are positive, consumption will be inefficiently high unless the government corrects the decisions by taxation (or regulation). To restore efficiency, Pigou (1920) demonstrates that the optimal tax on the consumption of a good that generates a negative externality should be as large as the societal damage of an additional unit produced and consumed.<sup>31</sup> Such a tax raises the prices *post-tax* that consumers face and sets them to a level that reflects not only the private costs of an additional unit, but also the social costs.

A limitation of the classic Pigouvian analysis is that it abstracts from taxes needed for reasons other than externalities. Specifically, it does not take into account any distortionary

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<sup>31</sup>For example, if producing a litre of fuel and burning it in the engine of a car emits 3 kilogram of carbon dioxide and the marginal social damage of carbon dioxide emissions is 30 EUR per ton, then according to the Pigouvian principle the tax on fuel should be 9 cents per litre.

taxes that are required for raising funds for public expenditure and/or income redistribution. Sandmo (1975) extends the analysis of externalities to cases in which the government uses other, linear taxes to satisfy a revenue requirement. He shows that the marginal social damage affects only the tax formulas for the externality-generating good, but not for other goods. This is an important result, since it demonstrates that the Pigouvian principle extends to second-best settings with distortionary taxation. In particular, it suggests that the design of environmental taxation might be separated from the design of other areas of taxation.

However, Sandmo (1975) only considers proportional taxes on goods and services and abstracts from the possibility of nonlinear income taxes. Subsequent studies with nonlinear income taxation confirm the general principle that externality-based terms are only present in the tax formulas for goods that generate those externalities. However, these studies also find that the entire tax system is shaped by considerations relating to the design of the income tax (see Pirttilä and Tuomala, 1997, for example). Therefore, the Pigouvian principle of taxing goods in relation to their marginal social damage needs to be generalized beyond the direct mechanical effect of externalities. For example, externalities may assist redistributive policy (e.g., when pollution reduces the value of leisure) and then a more lenient taxation of externalities would be advisable. In other words, the design of environmental taxation and the design of income taxation can in general not be separated.

Despite the subtle interplay between environmental taxation and income and consumption taxation, the policy debate is often dominated by a stylized connection between the different tax instruments: the double-dividend hypothesis (Pearce, 1991; Oates, 1991). According to this hypothesis, the taxation of polluting activities yields a direct dividend in terms of environmental benefits and an indirect dividend in terms of a raised efficiency of the tax system. The raised efficiency of the tax system is realized by means of a *green tax reform* which uses the tax revenue from environmental taxes in order to lower other taxes that are perceived as harmful, such as taxes on labor. With this ambition in mind, the environmental taxes can be set higher than what is motivated based on purely environmental considerations. Yet, there are four main problems with this type of reasoning.

1. Environmental taxes do not target long-run sustainable tax bases. As the environmentally harmful activity decreases, so does the tax revenue.
2. Environmental taxes, in accordance with most taxes, discourage labor supply. Hence, the combined effect of a green tax change does not necessarily increase the incentives for working.
3. Green tax changes often have undesirable distributional consequences. While the burden of the income tax is distributed broadly in the working population, environmental taxes have the strongest impact on individuals who have the hardest time to adjust their consumption in an environmentally-friendly manner (e.g., individuals living in rural areas that are dependent on their car).

4. Environmental taxes raise a very small share of total tax revenue as compared to taxes on labor. Hence, for a substantial green tax change, the government would have to drastically raise existing environmental taxes or find new tax bases.

Another limitation of the government's ability to implement green tax changes is the risk that environmentally harmful activities move abroad. In particular, firms may move their production to countries with lower or even zero taxes on emissions. This extensive margin risks leading to increased global emissions and to additional idiosyncratic costs for the domestic country in terms of reduced employment and lost tax revenue. Given that environmental taxes often target firms, they are, just like corporate income taxes, subject to tax competition between countries. Therefore, a successful green tax reform requires coordination between countries.

## 5.2 Internalities

Internalities refer to situations where individuals make decisions that do not maximize their own welfare. In some sense, an externality is an externality that an individual imposes on himself/herself. The empirical evidence for internalities is pervasive. Many studies in behavioral economics document that individuals tend to overconsume certain goods and services due to problems of self-control or incorrect perceptions regarding the utility that different types of consumption entail (for example, due to information frictions).

Hence, internalities seem to motivate differentiated consumption taxation for similar reasons as in the case of externalities. However, differentiated consumption taxation is not uncontroversial in this context, since it builds on the idea that the government understands individual well-being better than the individuals themselves. This can be viewed as paternalistic and in violation of individuals' rights to make their own decisions. Another question is whether government intervention really is needed or whether private markets on their own can come up with solutions that combat internalities. For example, in recent years, thousands of mobile apps have been created to help individuals deal with different self-control problems.<sup>32</sup> Hence, internalities represent a weaker argument for differentiated consumption taxation than externalities do. One reason is certainly that individuals are better informed about the consequences of their behavior on their own well-being than they are informed about consequences on the well-being of others.

An externality that has been frequently discussed in recent years is the consumption of sugary products, such as candy and soft drinks. Here, an externality arises if individuals do not fully take into account how current sugar consumption affects their future health. Several countries have introduced, or plan to introduce, regulations and taxes with the purpose of reducing sugar consumption. A particular focus is on sugary drinks. As of mid-2020, more than 40 countries impose special taxes on sugar-sweetened beverages ([Global Food Research Program, 2020](#)).

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<sup>32</sup>For example, there are many widespread apps designed to help individuals reduce smartphone use, quit smoking, lose weight, exercise more regularly, and so on.

Another example of an internality are energy-efficient goods, such as energy-efficient refrigerators, that are prone to be underconsumed because they are expensive upon purchase, but result in lower electricity bills and thereby create individual economic benefits that add up in the long run (beyond their environmental benefits).

Interestingly, consumption that is characterized by internalities often gives rise to externalities on society. For example, sugar consumption does not only impose costs on the individual, but also costs to society in terms of tax-financed health care bills.<sup>33</sup> Similarly, energy-efficient products do not only reduce the individual electricity bill, but also lead to reduced carbon-dioxide emissions (see e.g. [Allcott et al., 2014](#)). For this reason, there is often a double reason to use tax instruments to correct for externalities.

As with externalities, when taxes are used to combat internalities, unintended distributive effects arise that can be hard to neutralize. For example, goods with a high sugar content (that the government would like to tax for internality reasons) tend to be consumed to a greater extent by low-income households. Similarly, goods that are energy efficient (that the government would like to subsidize for internality reasons) tend to be consumed to a greater extent by high-income individuals. Therefore, taxes and subsidies motivated by internalities are often regressive. However, an important insight is that when the behavioral biases are larger for low-income households, the corrective benefits of these interventions benefit to a greater extent low-income households.

[Allcott et al. \(2019a\)](#) develop a theoretical and empirical framework for studying the design of sugar taxes (and other taxes in settings with internalities) and highlight that the optimal design of a sugar tax depends on the following factors:<sup>34</sup>

1. How the tax burden of a sugar tax varies with household income.
2. How sensitive the demand for sugar is in different income groups.
3. How large the health gains are as a result of the behavioral changes in different income groups.
4. To which extent it is possible to use the tax revenue from the sugar taxes to partially offset the regressive distribution of the tax burden of the sugar tax.
5. What external effects sugary consumption has on society as a whole, for instance, in the form of additional health care costs.

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<sup>33</sup>When health care is publicly financed, as it is in many countries, unhealthy consumption decisions have consequences for public expenditure. Therefore, taxes on unhealthy food are easier to motivate in countries where health care is publicly financed as compared to countries where individuals have to pay themselves for their health care needs. Taxes on goods with adverse health consequences can hence be seen as extra insurance premiums that have to be paid to compensate the government for increased expected future health costs.

<sup>34</sup>Based on their calculations, [Allcott et al. \(2019a\)](#) find that sugar taxes between 30 and 60 percent of the price of sugary drinks are optimal. The authors report that American households with low incomes consume about 100 liters of sugary beverages per year, whereas high-income household only consume 50 liters per year. Another important area where internalities appear large is the case of lotteries; see [Lockwood et al. \(2021\)](#) for a recent contribution.

Further, in a survey article, [Allcott et al. \(2019b\)](#) present a number of guiding principles for policy-makers concerning sugar taxes. Their first message is that sugar taxes should be designed to maximize social welfare and not to minimize sugar consumption. If the goal was to minimize sugar consumption, the government should simply forbid the consumption of unhealthy food, such as sodas. However, this perspective does not take into account the utility consumers get from unhealthy food and how such a ban would affect the producers. Instead, taxes should be set to correct for the market imperfections arising from externalities and internalities. Another message is that public policy should try to reduce consumption in the groups of the population that generate the largest externalities and internalities. For this reason, it is particularly desirable to reduce sugar consumption among children, since habits that are established early in life can persist in the long run. Moreover, taxes to combat externalities should be levied as close as possible to the source. Therefore, the ideal tax should be on sugar itself and not on, for example, the volume of soda.

To sum up, we conclude that there are good reasons for taxes on unhealthy food products, such as sugar, and also recent research that can guide the design of such taxes. An important caveat is that this research typically abstracts from the difficulties associated with cross-border shopping. A corrective tax that is not coordinated among countries or bordering states is bound to be unsuccessful.<sup>35</sup>

### **5.3 Subsidizing work-related consumption can increase labor supply**

Apart from externalities and internalities, the strongest argument for differentiated consumption taxation is the link between labor supply and the consumption of certain goods and services. When some consumption goods affect the preferences for work, the second assumption of the Atkinson-Stiglitz theorem is not satisfied (see Section 4.1) and a uniform taxation is typically suboptimal. Based on this reasoning, [Christiansen \(1984\)](#) shows that subsidizing goods that are in higher demand among individuals who work more hours and taxing goods that are in higher demand among individuals with more leisure can reduce the distortions associated with the (nonlinear) taxation of labor income and thereby facilitate redistribution. The finding is reminiscent of the classic result by [Corlett and Hague \(1953\)](#) which advocates that goods that are complementary with leisure should bear higher tax rates than other goods, even if the underlying logic is somewhat different.<sup>36</sup>

According to the above reasoning, goods such as golf clubs or fishing tools should be subject to higher tax rates because they are complementary with leisure. However, this type of tax differentiation is not widespread in practice—perhaps due to political reasons as such taxes

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<sup>35</sup>The Norwegian experience illustrates this. After a steep raise of taxes on sugary products in 2018, cross-border shopping to Sweden increased substantially. The taxes were reduced to their former levels in 2020.

<sup>36</sup>The Corlett-Hague result builds on the representative-agent linear-taxation framework developed by [Ramsey \(1927\)](#), whereas [Christiansen \(1984\)](#) analyzes optimal taxation in a framework of optimal commodity and nonlinear income taxation following [Mirrlees \(1971\)](#) and [Atkinson and Stiglitz \(1976\)](#). [Christiansen \(1984\)](#) discusses the relation between the “new” findings and the classic result by [Corlett and Hague \(1953\)](#).

would be unpopular. An alternative explanation is that individuals would not actually work more hours if leisure goods were taxed more heavily. Possibly, the only effect of such taxes would be that individuals enjoy their leisure time less. Ultimately, it is an empirical question how much taxes on leisure goods can help to strengthen the incentives for work. The empirical evidence on this question remains scarce up to now.

However, there are many practical examples where goods that are *complements to labor supply* are subsidized. These will be discussed next.

### 5.3.1 Child care and elderly care

The most prominent example of a good/service that is positively related to work is child care, which constitutes a precondition for the labor supply of parents with small children. When child care is subsidized and the subsidies are financed by tax revenues, increasing labor supply not only boosts parents' incomes but also allows the families to benefit more from a subsidized service (and implicitly recover some of the taxes paid). This twofold gain promotes the labor supply of individuals who are subject to progressive income taxation. Hence, the policy helps to reduce the adverse effects of taxes on labor supply, and thus facilitates redistribution.<sup>37</sup>

A number of recent studies try to quantify the welfare gains of subsidized child care. These studies highlight that the optimal type of the subsidy depends on what information the government can observe at reasonable costs. Since it is difficult for the government to monitor the exact number of hours a child spends in child care (since it can lead parents or child care centers to misreport hours), it is most common to subsidize child care in relation to the associated expenditure rather than time. Importantly, child care expenditure can be subsidized in many different ways, for example through a tax deduction, a tax credit or discounted prices of publicly provided care.

[Bastani et al. \(2020\)](#) study how child care should be subsidized when the government simultaneously optimizes a nonlinear income tax. They highlight that those who work more hours and demand more child care do not necessarily have higher child care expenditure than those who work fewer hours. For example, well-educated parents with high wages may choose to work part-time, while at the same time consuming child care services of high quality with an expensive hourly price.<sup>38</sup> The authors argue that the gains of subsidized child care probably are the largest in markets where the quality of the child care is relatively homogeneous and the price variation is not large. Moreover, publicly provided care, with a standardized quality, could be a particularly efficient way to subsidize child care.<sup>39</sup>

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<sup>37</sup>The large review of the tax system in the UK carried out under the direction of James Mirrlees ([Mirrlees et al., 2011](#)) recommended that goods and services be taxed uniformly—with the exception of child care services that ought to be subsidized in relation to other goods.

<sup>38</sup>One reason for this pattern could be that educated parents attach a higher weight to the human capital formation of the child.

<sup>39</sup>Parents not satisfied with the quality of public child care can choose a different facility, but are then forced to pay some or all of the costs themselves. For public provision schemes to be effective, it is necessary that the quality is perceived as satisfactory so that the majority of the population does not opt out—otherwise individuals would

There is also a discussion about the extent to which child care subsidies should be means-tested. Note that the way in which subsidies are provided can affect households very differently depending on their income: publicly provided services at low prices generate identical cost savings for all families using those services, whereas subsidies in the form of tax deductions or tax credits have a value that depends on family income. [Ho and Pavoni \(2020\)](#) explore the income-dependent design of child care subsidies for single mothers and find a large degree of means-testing to be optimal. More precisely, they argue that subsidy rates should be very high for earners at the bottom of the income distribution, and fall quickly with income.

A similar argument to that of child care can be made for the subsidization of elderly care. Elderly care services can be important to facilitate labor supply among middle-aged workers (typically aged 50 and above) with elderly relatives in need for care.<sup>40</sup> So far, the labor supply effects of elderly care and the benefits of subsidized care have received relatively less attention in the research literature.<sup>41</sup>

### 5.3.2 Household services, maintenance and repairs

Non-care household services such as cleaning, gardening, home repairs and maintenance are further important examples of services that are associated with labor supply. Similar to child care and elderly care, these services can either be produced by the household or purchased in the market. If individuals work in their own household, they earn no formal income and bear no income taxes. However, if they work in a regular job and outsource some household tasks to a professional provider, their income (and that of the provider) is taxable. Therefore, income taxation discourages formal work and hinders the specialization on the tasks that individuals are most qualified for. A subsidy to household services can counteract these problems. Hence, similar to care services as discussed above, subsidies to household services reduce the distortions caused by income taxation and enable redistribution at a lower efficiency cost.

Even though household services may not be as strongly connected to labor supply as child care, they are relevant for a much larger group of individuals (not only families with small children). [Koehne and Sachs \(2022\)](#) quantify the benefits of subsidizing household services based on empirical evidence for the US. They find that optimal subsidy rates typically increase with income. They also show how optimal subsidies can be implemented by means of an income tax system allowing for nonlinear deductions of expenses on household-services.<sup>42</sup>

Sometimes subsidies to household services are motivated on the basis that they reduce the size of the underground economy and reduce long-term unemployment by increasing the num-

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have to pay twice for these services (once through the income tax and another time through a private purchase), which would have adverse effects on labor supply.

<sup>40</sup>Although long-term care policies are often studied in models of asymmetric information, the informational frictions typically differ considerably from the Mirrleesian approach to nonlinear income taxation ([Mirrlees, 1971](#)). See [Jousten et al. \(2005\)](#), [Cremer and Roeder \(2013\)](#) and [Cremer and Pestieau \(2014\)](#).

<sup>41</sup>See [Lilly et al. \(2007\)](#) for an overview and [Løken et al. \(2017\)](#) for a more recent contribution.

<sup>42</sup>Earlier studies of optimal taxation with household production include [Anderberg and Balestrino \(2000\)](#), [Kleven et al. \(2000\)](#), [Cremer and Gahvari \(2015\)](#) and [Olovsson \(2015\)](#).

ber of formal low-skilled jobs. While these seem relevant goals, it is not obvious that consumption taxation should be used to address them, as there may be better, more direct instruments to achieve these goals. Subsidies to household services still distort individual consumption choices and may lead to arbitrary redistribution between groups (for example, based on where individuals live or how much individuals value a clean home, rather than their ability to pay taxes). Another side-effect is that subsidies to household services not only subsidize the consumers, but also the producers of these services.<sup>43</sup>

## 5.4 Heterogeneous consumption preferences

The [Atkinson and Stiglitz \(1976\)](#) result discussed in section 4.1 assumed that all individuals had the same consumption preferences and that earnings ability was the sole dimension in which agents differ. If this assumption is relaxed, the Atkinson-Stiglitz result generally breaks down. The implications of heterogeneous consumption preferences for optimal taxation have been explored in a number of papers, see [Saez \(2002\)](#), [Blomquist and Christiansen \(2008\)](#), [Kaplou \(2008\)](#), [Golosov et al. \(2013\)](#), [Gordon and Kopczuk \(2014\)](#), [Gauthier and Henriet \(2018\)](#), and [Allcott et al. \(2019a\)](#), among others. In settings where individuals differ not only in terms of their earnings ability, but also in terms of their consumption preferences (and there is some relationship between them), differential consumption taxation typically enhances social welfare in two ways. First, it allows the government to increase the total amount of redistribution carried out in the economy. Second, it allows the government to reduce the distortions associated with the progressive (nonlinear) labor income tax.

To see that the amount of redistribution can be increased, consider two individuals with different earnings abilities who have the same labor income (but different labor supplies). In this situation, the income tax cannot differentiate between these two individuals. However, a differentiated consumption tax can, provided that the individuals consume different goods, which generally will be the case if there is a relation between earnings ability and consumption preferences. By taxing goods that are preferred by high-ability individuals, the government achieves redistribution conditional on labor income, enhancing the overall redistribution of the tax system.<sup>44</sup>

To understand how differentiated consumption taxes can reduce the distortions of income taxation, imagine that high-ability individuals have a much stronger preference for some goods, e.g., lobster and champagne, than low-ability individuals do (even conditional on income). If the tax system shifts part of the tax burden from the income tax to taxes on lobster and champagne consumption, the welfare of individuals with a low ability is largely unaffected, but

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<sup>43</sup>Sometimes subsidies to household services are criticized on the basis that they mainly benefit high-income households. However, this is not a relevant criticism, as distributional concerns can be addressed by adjusting the income tax system appropriately (see [Koehne and Sachs, 2022](#)).

<sup>44</sup>These results bear some resemblance to the findings by [Diamond \(1975\)](#). However, instead of recommending that goods consumed disproportionately by high-income individuals should be taxed, the recommendation is to tax goods that are consumed disproportionately by high-ability individuals.

it becomes significantly less attractive for individuals with a high ability to have a low income, since their life-style based on lobster and champagne has become more expensive to maintain. This change strengthens the incentives for high-ability individuals to earn a high labor income, creating an efficiency gain.

Despite the theoretical justifications above, heterogeneity in preferences does not constitute a strong argument for differentiated consumption taxation because empirical knowledge about the relationship between ability and consumption choices is very limited. The main empirical difficulty is to disentangle the effect of having a high income from the effect of having a high ability.<sup>45</sup> Moreover, [Kaplow \(2008\)](#) and [Gauthier and Laroque \(2009\)](#) argue that if it is possible to identify differences in consumption patterns that depend on ability, and if it is at the same time possible to tie these differences to verifiable personal attributes (such as age), it is better to directly base the income tax system on these attributes instead.<sup>46</sup> In this way, distortions in individual consumption choices can be avoided. Finally, given that consumption preferences most likely have a small correlation with ability, differentiated consumption taxes will lead to arbitrary redistribution across individuals. In sum, given the existing (lack of) empirical evidence, differences in consumption preferences across individuals do not serve as a compelling reason for differentiated consumption taxes.

## 5.5 Wealth differences and non-homothetic preferences

A subtle case for differentiated consumption taxation arises when there are differences in disposable income among individuals with the same pre-tax labor income, and these differences relate to earnings ability. Such a pattern can happen, for instance, if among individuals with the same labor income, those with a high earnings ability are more likely to possess inherited wealth or receive transfers from a partner or other family members. In such situations, holding labor income fixed, high-skilled individuals will have more resources available for consumption than low-skilled individuals do. This implies that among individuals who earn the same labor income, high-skilled individuals will demand goods and services in a different way compared to low-skilled individuals, and therefore differential consumption taxation can, in a similar manner to the previous subsection, discourage high-skilled agents from reducing their labor income in reaction to progressive labor income taxation. More specifically, it will be optimal to impose higher tax rates on goods that are disproportionately preferred by individuals with a

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<sup>45</sup>[Bastani and Waldenström \(2021\)](#) tackle this problem by studying an empirical setting with a kinked budget set where individuals with different earnings abilities are pooled at the same income level (at the kink point of the labor income tax in Sweden). They show that the individuals who bunch not only have higher ability, as measured by military enlistment scores in young adulthood, but also have higher capital income. This suggests that taxing capital income is desirable from the perspective of taxing ability, and can lead to efficiency gains according to same principle as in the text.

<sup>46</sup>Typically, income taxes can be tied to the identity of individuals and therefore related to such attributes, whereas consumption taxation is usually assumed to be anonymous and thereby cannot be tied to individual attributes.

high disposable income.<sup>47</sup> In other words, income elasticities of demand become relevant for the determination of optimal consumption tax rates, even though the government has access to nonlinear labor income taxation.<sup>48</sup>

An important observation is that the differences in consumption behavior described above originate from differences in wealth, not differences in preferences. In contrast to preferences, wealth is taxable. Therefore it would be more efficient to tax the wealth itself, which is the source of the difference in consumption behavior, rather than differentiating the consumption tax, which distorts the consumption choices of individuals. However, typically, there are strong practical and political obstacles to taxing wealth.

## 5.6 Relative consumption concerns

It is well-established in the academic literature that individuals do not only care about their own absolute levels of consumption, but also how their consumption relates to the consumption of others (see e.g. [Alpizar et al., 2005](#)). This implies that consumption of certain goods (or consumption in general) can have negative externalities—as one individual increases her consumption, she decreases the relative consumption of others.

In general, it is difficult to judge whether or not relative consumption concerns motivate differentiated consumption taxation, since it is hard to identify the goods that are subject to the most intense status comparisons. Another aspect is that the goods that are used in status-races might change over time, and taxing one good that is considered positional today, might cause other goods become positional tomorrow. There are also other problems. A well-known example is the luxury tax on yachts in the United States in the 1990:s, which eliminated a lot of jobs in the domestic yacht industry and was scrapped in 1993.<sup>49</sup>

For the above reasons, it is common to view status concerns as an argument for progressive income taxation or progressive consumption taxation (see Section 3.7), rather than for high tax rates on specific status goods or luxury items. This will also be the ideal policy response if consumers mainly care about how their total income or their total consumption compares to the income or consumption of relevant reference persons.<sup>50</sup>

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<sup>47</sup>The result depends on how the incentive problems look like in relation to the two-dimensional distribution of ability and wealth. The simplest case is obtained by assuming a perfect correlation between ability and wealth.

<sup>48</sup>This mechanism was first explored by [Cremer et al. \(2001, 2003\)](#). A similar result was presented by [Bastani et al. \(2014\)](#) in the context of child care services. Individuals with high skill who work fewer hours in order to reduce their taxable income (to lower the tax burden) need to buy fewer hours of child care and will therefore have a higher disposable income than low-skilled individuals earning the same labor income (provided that individuals with a high skill and low labor supply do not buy a substantially higher quality; see [Bastani et al. 2020](#)). Taxing goods with high income elasticities makes it less attractive for high-skilled individuals to engage in such working hours reductions, thereby allowing to improve the efficiency of the tax system.

<sup>49</sup>See [Salpukas \(1992\)](#).

<sup>50</sup>How status concerns affect the optimal design of income taxation is studied by [Persson \(1995\)](#) and [Aronsson and Johansson-Stenman \(2008\)](#) among others.

## 5.7 Education

Education is often regarded as an investment in human capital. By engaging in education, individuals can enhance their labor market productivity and income in the future in exchange for a loss in income and costly education effort today. Sometimes education is not only viewed as a way to enhance human capital, but also as a way to signal existing productivity to potential employers. However, education can also be viewed as consumption, and therefore we discuss it in this paper.

Education belongs to the a category of consumption goods that is sometimes referred to as *merit goods*, referring to goods and services that the government subsidizes as they are viewed to entail positive internalities or externalities to society. Merit goods can also refer to goods and services that society thinks all individuals should have access to (such as emergency health care), according to a principle that is sometimes called *commodity egalitarianism*.

How education should be subsidized is a complex question that cannot be done full justice here.<sup>51</sup> Based on the static approach to taxation that we largely follow in this paper, two key observations can be made: (i) to the extent that education can be treated as a consumption good, education subsidies affect individual consumption patterns and therefore entail distortions (a possibility is certainly that individuals consume too much education in relation to other goods), and, (ii) there are reasons to subsidize education to combat the distortions associated with progressive income taxation since such taxation reduces the incentive to invest in education (see [Bovenberg and Jacobs, 2005](#)).<sup>52</sup>

## 5.8 Housing

The largest consumption good for most individuals is their housing. The taxation of housing is one of the most complex areas of tax research, because housing serves both as an investment and a consumption good. Moreover, the consumption flow from housing—just like that of other durable goods—is dynamic and affected by mechanisms (e.g., adjustment frictions) that differ notably from nondurable consumption goods. Given these difficulties, a comprehensive analysis of housing seems infeasible and research papers tend to focus on the durable aspect of housing consumption (e.g. [Koehne, 2018](#)) or on housing as a capital good (e.g. [Eerola and Määttänen, 2013](#); [Nakajima, 2020](#); [Borri and Reichlin, 2021](#)).<sup>53</sup>

[Koehne \(2018\)](#) shows that durable consumption goods justify differential taxes even when the preferences for consumption are separable from labor supply (and independent of the ability to earn income). In this sense, the Atkinson-Stiglitz result breaks down in the context of durable goods. However, the direction and magnitude of tax differentiation are hard to predict

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<sup>51</sup>Recent studies of education subsidies highlight the role of risk, life-cycle patterns and borrowing constraints; see [Bohacek and Kapicka \(2008\)](#), [Findeisen and Sachs \(2016\)](#), [Stantcheva \(2017\)](#), [Kapička and Neira \(2019\)](#), [Colas et al. \(2021\)](#).

<sup>52</sup>At the same time, it is possible that the progressive income tax system in combinations with the social transfer system encourages riskier human capital investments.

<sup>53</sup>See also [Parodi \(2021\)](#), who studies the taxation of durable goods focusing on non-housing consumption.

as they depend on details of individual preferences (e.g., nonseparabilities between durable and nondurable consumption) and the nature of adjustment costs.

In the case of housing, tax differentiation may also be justified by externalities or by ability-based taxation. For instance, it is sometimes claimed that those who own their house take better care of it, and are more likely to positively contribute to the residential area where they live, which is an argument for taxing housing lower relative to other goods (see e.g. [Rossi-Hansberg and Sarte, 2012](#)). Moreover, housing could be a consumption good that is consumed to a relatively greater extent by high-ability individuals, although the evidence is not fully conclusive.

However, it is not obvious that these arguments for tax differentiation can justify the large tax privileges for housing that are found in many countries.<sup>54</sup> Assessing the benefits and costs of tax differentiation for housing remains a challenging question and requires breakthroughs in the simultaneous modeling of consumption, investment, labor supply and the housing market.

## 6 Conclusion

In this paper, we have discussed determinants of the optimal level of consumption taxation and the orthogonal issue of whether and how consumption taxes should be differentiated across goods and services.

Concerning the appropriate level of taxation, we have demonstrated that consumption taxes have many similarities with income taxes. However, we have shown that consumption taxes differ from the latter by creating an extra tax burden on wealth, on excess returns to capital, and on non-declared incomes. Moreover, consumption taxes limit the gains from tax planning attempts when individuals shift incomes between different tax bases. In our view, these mechanisms motivate a substantive role of consumption taxation in the overall tax mix. How strong the reliance on consumption taxation should precisely be, however, remains an important open question. Although the current state of the literature does not come close to a final answer, the existing results point to several key mechanisms that quantitative approaches should take into account.<sup>55</sup>

Concerning the scope of tax differentiation, we have argued that—based on seminal theoretical results and a number of practical considerations—uniform tax rates are generally advisable. However, differential taxes are justified when goods or services cause externalities (or internal-

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<sup>54</sup>Of course, housing is also subject to several taxes, such as transaction taxes and recurrent property taxes. To measure the effective tax burden, these taxes have to be weighed against various subsidies such as mortgage interest relief and transfers and other deductions for homeowners. See [Millar-Powell et al. \(2022\)](#) for a recent survey of the effective tax burden on housing.

<sup>55</sup>In the macroeconomic literature, numerous contributions have explored the welfare implications of replacing the income tax system with consumption taxation, see for example, [Krusell et al. \(1996\)](#), [Altig et al. \(2001\)](#), and [Conesa et al. \(2020\)](#). However, the question of the appropriate balance income and consumption taxation, taking into account issues such as the taxation of excess returns, income shifting between tax bases, and undeclared income is largely unexplored.

ities) or when their demand is closely related to individual labor supply. We have also summarized some additional theoretical justifications of tax differentiation, such as ability-based taxation, non-homothetic preferences, or relative consumption concerns. Yet, in our view, these cases do not serve as a strong argument because the existing amount of empirical evidence is too limited or because alternative tax instruments appear more targeted.

Finally, education and housing are two important goods whose consumption aspect represents only a part of their value. Therefore, these goods are usually analyzed in special models that are tailored to their particular characteristics. Tax incentives for educational expenses can be justified by similar principles as those for other goods and services that are related to labor supply. The case of housing is more complicated because housing is both a durable consumption good and an asset, involves externalities on neighbors, and is traded in a market characterized by risky prices and adjustment frictions.

In closing, we would like to point out a couple of broad areas where we think more research would be especially valuable. While there is already a rich literature that quantifies optimal education subsidies, the literature on optimal housing taxation is currently at its infancy. This is certainly an area where future research seems warranted. Another important task for future research is to quantify optimal externality-based or work-based tax incentives for specific consumption goods. While the basic idea of corrective taxes in the context of externalities is well established and dates back at least to [Pigou \(1920\)](#), state-of-the-art simulations of corrective taxes that account for the complex distributional effects of taxation remain scarce.<sup>56</sup> A similar gap between theory and quantification exists in the case of work-related tax privileges.<sup>57</sup> Finally, an important aspect that we have only touched lightly upon is the role of consumption taxation in developing countries with a large informal sector. Here important empirical studies are being conducted (see e.g., [Bachas et al. \(2022\)](#) on the distributional incidence of consumption taxes in developing countries) but theoretical studies guiding the design of consumption taxation in developing countries remain scarce.

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<sup>56</sup>[Allcott et al. \(2019a\)](#) conduct a rich quantitative analysis of optimal soda taxes. Their framework could serve as a starting point for approaches to other forms of corrective taxation.

<sup>57</sup>See [Koehne and Sachs \(2022\)](#) for a first pass towards quantifying tax deductions for household services.

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