

How Should Consumption Be Taxed?

Spencer Bastani*

Sebastian Koehne[†]

April 12, 2023

Abstract

We review the theoretical justification for consumption taxes in advanced economies, providing a systematic review of the extensive public finance literature that examines how goods and services should be taxed. Our discussion focuses on both the determinants of the optimal level of consumption taxation relative 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, and practical considerations. The aim is to provide guidance to academics and policymakers on the main trade-offs in consumption taxation and to highlight important areas where further research is needed.

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

JEL codes: H21, H24

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

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

1 Introduction

In this paper, we review the theoretical rationale for consumption taxes in advanced economies and provide a systematic overview of the vast public finance literature that examines 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 difficult terrain for academics and policymakers to navigate. Moreover, there is little discussion of the basic principles of consumption taxation and the economic consequences of changing the relative importance of consumption and other taxes in the tax system. The purpose of this paper is to fill these gaps. Our discussion blends classical public finance results, recent developments in the optimal tax literature, and practical considerations.¹

Given the various forms of consumption taxation that exist in practice, our paper focuses on two natural policy questions: (i) how should consumption be taxed relative 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. On the issue of tax differentiation, it should be noted that differential tax rates can be created in a number of ways, such as through excise taxes, reductions or exemptions within the VAT system, or through 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 rationale behind any form of differentiation—without taking a strong position on specific implementations of differential rates.²

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

Critics of consumption taxation argue that it is regressive because low-income individuals consume a larger share of their income.³ This is certainly a valid objection to over-reliance on

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

²In some cases, one of these implementations may seem particularly natural. For example, if the government wants to reduce environmentally harmful consumption, it seems straightforward to use an excise tax in which the tax burden is tied directly to the quantity consumed, rather than a tax based on the value of sales (price times quantity), since it is usually the quantity consumed that causes the environmental damage. As another example, if the government wishes 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 on particularly targeted households.

³Undesirable regressivity may be one reason why countries that rely heavily on consumption taxation have preferential tax rates for necessities such as food or medicine. Such rebates are inefficient, however, because distributional concerns can be more accurately addressed through income taxation and targeted transfers to households. Addressing distributional concerns in this way avoids distortions of competition and distortions of consumption and production decisions. In addition, the distributional effects of differentiated consumption taxes are notoriously

consumption taxes. In practice, however, consumption taxes are always combined with many other forms 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 shift from labor to consumption increases the tax revenue from labor income that is reclassified as lightly taxed capital income.⁴ Second, a tax shift from labor to consumption increases the taxation of excess returns to capital, which is desirable on distributional grounds, provided that individuals with higher earning capacity earn higher returns on their investments.⁵ Overall, we conclude that there is a compelling and diverse theoretical justification for consumption taxation. Finding the appropriate level of consumption taxation, however, will require new quantitative advances that assess the relevance of these 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-induced distortions in consumption and production decisions. We argue that several practical considerations support this view. First, uniform tax rates are less susceptible to pressure from lobbying groups. Second, uniform rates are consistent with horizontal equity principles because they avoid redistribution among individuals with identical incomes but different consumption tastes. Third, uniform rates are administratively parsimonious and avoid delineation problems.

However, we highlight two broad areas where differential consumption taxation is motivated. The first area is, of course, consumption that generates negative externalities or internalities. Typical examples are goods that have adverse effects on the environment or individual health, such as fossil fuels, alcoholic beverages, tobacco products, or sugary foods and beverages. Here, unit taxes are useful to improve economic efficiency by incorporating the social impacts of consumption into final prices. Taxes should be targeted at the underlying environmental or health problem and levied at levels that are motivated by the damage caused. They should not be used as a general instrument to raise tax revenue.

The second area of differentiation concerns goods and services whose demand depends on the supply of labor, such as child care and domestic services. Subsidies for such services can provide 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 providing these services themselves and purchasing them in the market, thereby increasing the incentive to work in the market relative to the household sector and contributing to increased specialization in the economy.

difficult to quantify because they depend on how firms adjust their prices in response to the taxes.

⁴If the shift is accompanied by reductions in labor income tax rates for high earners, it also reduces the incentive to shift income across bases.

⁵The change may also be motivated on efficiency grounds if the 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 investment and entrepreneurship, which can stimulate economic growth.

As will be shown below, consumption taxes are quantitatively very important to the tax revenues of advanced economies. Yet the research literature discussing the theoretical underpinnings of these taxes is seldom reviewed.⁶ There are 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 VAT and excise duties on alcohol and tobacco for the United Kingdom. Clossen and Jacobs (2020) produce a similar volume for the Netherlands. Jacobs (2013) and Boadway and Cuff (2022) cover a wide range of topics in optimal taxation and apply the theoretical insights to various policy issues concerning the taxation of labor income, capital income, pensions, and consumption. In addition, 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 that of Christiansen and Smith (2021), who provide an in-depth textbook treatment of the economic principles behind the taxation of commodities, focusing in particular on the economic aspects of VAT, financial services, and international aspects of indirect taxation. Compared to their work, we place less emphasis on the above issues and instead focus more on the relationship between consumption and capital taxation (and the implicit taxation of excess returns inherent in consumption taxation), subsidies for child care and household services, and the implications of wealth differences and heterogeneous preferences, among others. We therefore see our work as complementary.

The paper is organized as follows. Section 2 briefly summarizes the practical relevance of consumption taxation. Section 3 discusses the optimal level of consumption taxes relative to other forms of taxation. It then turns to tax differentiation. Section 4 presents arguments for taxing consumption at a uniform rate. Section 5 discusses cases where differentiated consumption taxes may be justified. 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 around the world (Figure 1). In the 148 countries included in the UNU-WIDER Government Revenue Dataset, consumption taxes raised an average of 9.2% of GDP in 2019 (UNU-WIDER, 2021). The level 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 figures indicates, consumption taxation is now ubiquitous at all stages of development.

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

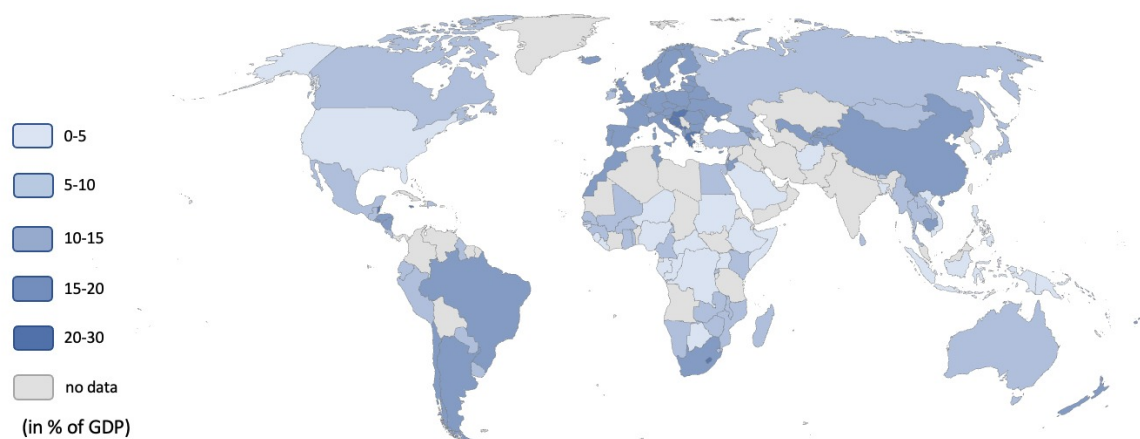


Figure 1: Consumption tax revenues as a share of GDP in 2019. Data source: UNU-WIDER Government Revenue Dataset (UNU-WIDER, 2021).

In the OECD, consumption taxes are the largest source of public revenue, accounting for about one-third of total tax revenue (Figure 2). However, as with most forms of taxation, there are notable differences between countries. Chile, Hungary, Latvia and Estonia are the OECD countries that rely most heavily on consumption taxes, raising 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, raising less than 20% of tax revenue from consumption taxes (OECD, 2022).

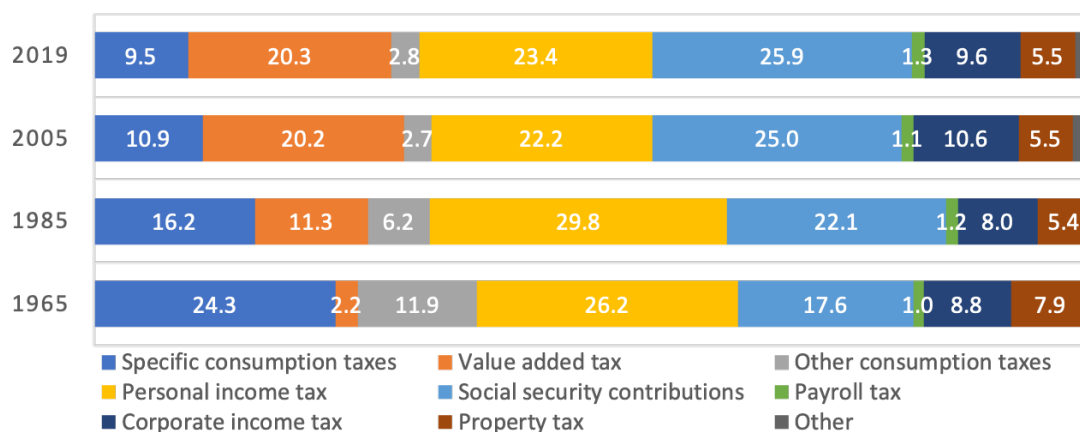


Figure 2: Tax structures as a percentage of total taxation, 1965–2019, OECD average. Data source: OECD (2022). Notes: *Specific consumption taxes* are defined in line with the the OECD classification 5120 and contain in particular excise taxes, customs, import duties, and taxes on specific services.

Consumption taxation typically consists of several layers. The main form of consumption taxation in most OECD countries is a value-added tax (VAT)—and in the United States, a sales tax. Both types of taxes are broad-based and target goods and services consumed by households.⁷ In addition to general consumption taxes, tax authorities levy additional taxes

⁷Sales taxes and VATs differ significantly in their implementation—VATs are levied at each stage of the

on specific goods, often referred to as excise taxes. Goods commonly subject to specific taxes include alcoholic beverages, tobacco products, fossil fuels, motor vehicles, and, more recently, foods and beverages high in sugar or fat. Historically, such excise taxes have accounted for the largest share of excise tax revenues. Nowadays, however, general consumption taxes in the form of VAT have become dominant, raising more than twice as much revenue as specific taxes; see Figure 2.

While the move toward VAT has been largely uniform (except in the United States) and includes 170 countries as of 2020 (OECD, 2020), the rate of VAT varies considerably from country to country.⁸ The standard VAT rate ranges from as low as 5% in Canada and 7.7% in Switzerland to 25% in Denmark, Sweden, and Norway and as high as 27% in Hungary. Most countries apply reduced VAT rates to selected goods and services such as basic necessities (some food and beverages, housing, medicine, health care, etc.) and a wide range of other goods and services such as transportation, newspapers, cultural products, hospitality services, and agricultural inputs. The level of rebates and the types of goods that qualify for them again vary widely from country to country (OECD, 2020).

3 Optimal level of consumption taxation

When discussing consumption taxes, it is useful to distinguish 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 examine the main advantages of consumption taxes relative to income taxes. The advantages and disadvantages of differentiated rates are discussed in sections 4 and 5 below.

We show that consumption taxes have many similarities to income taxes. The simple reason is that what is earned is consumed sooner or later. Therefore, both labor and income taxes create comparable disincentives to work, to invest in education, to become an entrepreneur, and so on. However, there are some important differences. In particular, consumption taxes achieve distributional gains by imposing an additional burden on wealthy individuals, individuals who earn excess returns to capital, and individuals who benefit from income shifting opportunities. Moreover, consumption taxes may be desirable from a tax enforcement perspective to the extent that undeclared income is used to finance domestic consumption. On the other hand, consumption taxes are typically constrained to be proportional, while income can more easily be taxed progressively. Overall, both income and consumption taxes should be strong pillars of the tax system.

production process, while sales taxes are levied only at the retail level. The approaches thus differ in their administrative complexity and their scope for tax evasion (e.g., OECD, 2020).

⁸The United States is the only OECD country without a VAT, using a subnational sales tax instead.

3.1 Consumption taxation and labor income taxation

An often-expressed view is that a greater reliance on consumption taxation (in exchange for reduced taxation of labor income) induces individuals to increase their labor supply. In its generality, this view is incorrect, since the purpose of earning 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 imposes a uniform tax on the value of consumption goods, a so-called *ad-valorem* tax, with a tax rate of 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 $t_y = 1 - 1/(1 + t_c)$. Thus, a proportional consumption tax is mathematically equivalent to a proportional labor income tax.⁹

The equivalence between taxing labor income and taxing consumption can be broken if, for some reason, individuals consider future consumption expenditures to be 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 increase the perceived returns to work. In this case, a shift to consumption taxation may stimulate labor supply.

A related issue is that unanticipated tax changes are, by construction, not harmful to past labor supply. Thus, tax changes affect current incomes differently from past incomes. 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 depletion of the consumer's wealth.

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

⁹This example compares proportional consumption taxes to proportional labor income taxes. An important practical difference is that consumption taxes are in most cases proportional, while income taxes are often nonlinear (progressive). We discuss distributional aspects in section 3.7.

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

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

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

The fact that consumption taxation implies an implicit tax on wealth can be considered desirable as it can lead to a reduction in wealth inequality. Moreover, by shifting the tax burden from current income to past income (wealth), consumption taxation will increase the incentive to work, provided that the tax reform is not anticipated. It should be noted, however, that such tax reforms affect 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 to 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. Again, we consider an individual with a lifetime labor income of y . Instead of choosing between different consumption goods at a given point in time, the problem now is how to allocate consumption over time. For simplicity, we assume that there are two life periods and that the individual finances 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 unity.

As 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 individual's intertemporal budget constraint is

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

where the consumption levels in periods 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 labor income.

Note that (4) is a special case of (1), and thus the equivalence between consumption taxation and labor income taxation is maintained. Importantly, consumption taxation is equivalent to a pure tax on labor income, leaving the return to saving untaxed. To see this, note that consumption in period 1 is equal to $c_1 = y - s$ and consumption in period 2 is given by $c_2 = (1+r)s$,

where s denotes the individual's savings. Therefore, 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 consumption tax 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 considered 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 thought of as the compensation required by an individual 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. However, the returns to capital observed in practice reflect much more than the normal rate of return. Realized returns include compensation for risk (the expected risk premium) as well as higher returns due to informational advantages, economies of scale (larger investments typically yield larger returns), and rents (e.g., due to imperfect competition, patents, or natural monopolies). Realized returns also reflect differences between expected and actual returns due to stochastic factors beyond the control of the individual.

To explore how excess returns affect the impact of consumption taxes, we assume that in addition to the normal return r , the individual also receives the excess return σ . 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 a tax rate of t , and assuming that the government discounts the tax revenue by a factor of $1/(1+r)$, the present discounted value of the 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, a consumption tax is no longer equivalent to a tax on labor income, since a tax on labor income does not tax the excess return σ , whereas a consumption tax does.

The fundamental difference is that labor income taxes are collected in period 1, while consumption taxes are only partially collected in period 1 (due to the tax deduction for savings), with the remainder 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 receive the common rate of return of r (which is not taxed by either the labor income tax or the consumption tax). However, in the presence of excess returns, a difference does emerge depending on the discount factor that the government

applies to the collection of tax revenue in period 2.¹⁰

In the presence of excess returns, consumption taxation is instead equivalent to labor income taxation combined with capital income taxation that allows a tax-free normal rate of return, the latter typically referred to as a *rate-of-return allowance*, RRA.¹¹ To see this result, note that we can rewrite the tax revenue 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 perspective because these returns contribute significantly to wealth inequality.¹² The taxation of excess returns can also be motivated by efficiency considerations to the extent that excess returns reflect economic rents. Beyond consumption taxation, excess returns can also serve as a general motivation for taxing capital income. For example, [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 earning ability and rates of return. Our discussion above provides a similar argument for the optimality of combining consumption and labor income taxes.

At the same time, excess returns also provide incentives for entrepreneurship and risky investment necessary for growth and international competitiveness, suggesting that taxes on excess returns should be limited. Finally, while we abstract from the 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 taxing both the normal and the excess return to capital.¹³

3.4 Consumption taxation and cross-base income shifting

An increased reliance on consumption taxation relative to the taxation of labor income also has implications for the taxation of entrepreneurs in the context of dual income tax systems. The dual income tax system is flexible in that it allows the government to set different tax rates on labor and capital income. For example, the mobile nature of the capital income tax base (due

¹⁰The appropriate rate of return to use has been hotly debated in the literature, see [Ahsan \(1989\)](#), [Ahsan \(1990\)](#), [Zodrow \(1995\)](#), and [Ahsan and Tsigaris \(1998\)](#). See also [Kaplow \(1994\)](#) and [Gentry and Hubbard \(1997\)](#).

¹¹Such systems of capital income taxation are used for equity placements in Norway and for unlisted equity investments in Finland. A system of capital gains taxation with a rate of return allowance was also recommended by the Mirrlees Review ([Mirrlees et al., 2011](#)), a recommendation recently reiterated by ([Adam and Miller, 2021](#)).

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

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

to international capital mobility) typically justifies a lower tax rate on capital income relative to labor income.¹⁴ However, such differentiation also invites cross-base income shifting, where entrepreneurs reclassify what is essentially labor income as capital income.¹⁵

What are the consumption tax implications of income shifting? A lower tax on labor income combined with a higher consumption tax rate implies an increased tax burden on entrepreneurs who finance their consumption by shifting labor income into lightly taxed capital income. Such a reform has desirable distributional implications, provided that 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 (who are associated with low welfare weights in typical social welfare functions).¹⁶ To 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 consumption among broad segments of the population, thereby stimulating aggregate demand.¹⁷ However, it is unclear how effective consumption tax cuts are given that firms can respond to such tax changes by adjusting output prices. For example, a VAT cut would have no effect on demand if firms refrain from lowering consumer prices. [Harju et al. \(2018\)](#) and [Benzarti et al. \(2020\)](#) find evidence of such behavior. Since consumers do not benefit much, VAT cuts are mainly 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 to VAT cuts ([Benzarti et al., 2020](#)). Thus, 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, say, durable goods.

A shift from labor income taxation to consumption taxation can also be a way to increase a country's international competitiveness, in the form of what is sometimes referred to as fiscal devaluation ([Farhi et al., 2013](#)). For example, by lowering payroll taxes and raising 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.

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

¹⁵For this reason, special income-splitting rules are usually required to specify how entrepreneurs' income should be allocated between the labor and capital tax bases. [Selin and Simula \(2020\)](#) study how the possibility of income shifting affects the design of optimal income taxation.

¹⁶At the same time, the reform reduces the incentives for cross-base income shifting.

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

3.6 Issues of tax administration

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

Direct (personal) income taxation is based on the principle that individuals and firms correctly report information on individuals' labor 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, which they then submit to the tax authority. Because of these differences in tax collection, the balance between labor and consumption taxes can play an important role in the administrative costs of the overall tax system and the extent of tax evasion. This is clearly an area of high policy relevance where more research is needed.

An important example is the taxation of undeclared income, such as foreign income. To the extent that foreign income finances domestic consumption, consumption tax revenue is generated. Thus, 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 tend also to be sectors that evade consumption taxes, and therefore the difference between taxes on consumption and taxes on labor should not be exaggerated from a tax enforcement perspective.¹⁸ Gordon and Nielsen (1997) argue that income and consumption taxes are avoided in different ways and that it is therefore desirable to combine labor and consumption taxes in the tax system.

3.7 Consumption taxation and progressivity

Above, we outlined some important distributional benefits of consumption taxation, namely that consumption taxes impose an additional burden on 1.) wealthy individuals, 2.) individuals who earn excess returns on capital, and 3.) individuals who take advantage of income shifting opportunities. However, our analysis was based on comparing proportional consumption taxes with proportional labor income taxes. In reality, labor income taxes are typically non-linear (progressive), while consumption taxes are most often proportional - for administrative and informational reasons. Therefore, if broader distributional goals are pursued, proportional consumption taxes should be complemented by progressive income taxes.¹⁹

Not all redistribution must take place through the tax system. Regardless of whether the government relies on labor, consumption or capital taxes, the expenditure side of the government budget plays an important role in overall redistribution. For example, households with different incomes may benefit differently from publicly provided services. If households with higher incomes are not satisfied with the quality of certain services provided by the govern-

¹⁸See also Kesselman (1989) and Richter and Boadway (2005).

¹⁹Because low-skilled individuals tend to have lower savings rates, taxes on wealth or capital income are also useful complements. See Diamond and Spinnewijn (2011) and Golosov et al. (2013).

ment, they will opt out and purchase these services privately (financed out of after-tax income). Since they pay for the services twice, once through the income tax bill and again through the private purchase, this arrangement implies an indirect form of redistribution from high-income to low-income households.

Regarding the distributive power of consumption taxes, it is important to note that, at least in principle, consumption taxes are not limited to being proportional. However, progressive forms of consumption taxation tend to be information intensive.

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 shows, 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 major obstacle to expenditure taxation is the need to track individual savings 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 allowed only for forms of saving where the margin of control is sufficiently large, which introduces distortions in individuals' savings portfolios. Given these serious complications, it is perhaps not surprising that expenditure taxes have not been permanently adopted in any country that we know of.²⁰

It should be noted that progressive consumption taxes have attracted renewed interest in recent years in the face of growing wealth inequality (see [Frank, 2016](#), for example). Moreover, expenditure taxes have the attractive feature that consumption is taxed regardless of whether it occurs domestically or abroad. On the other hand, expenditure taxes can lead to tax revenue losses if individuals accumulate savings domestically during their working lives and then move abroad during retirement.

Progressive consumption taxes are easier to implement if they are limited to goods purchased in non-anonymous markets, such as housing and land, utilities tied to property (such as electricity and water), or insurance contracts. However, since most goods and services are purchased anonymously, the distributive impact of such taxes is limited. Once transactions become anonymous, tax arbitrage renders nonlinear consumption taxes ineffective. For example, if there were a progressive tax on tobacco, a smoker with a high annual tobacco consumption who faces a high marginal tax rate on tobacco could ask a friend with a low annual consumption to make the purchase on his behalf, thereby avoiding the high marginal tax rate. Combating

²⁰Some elements of an expenditure tax can be obtained by introducing a deduction for retirement savings into the tax code.

such behavior is prohibitively complicated and costly for the tax authority.²¹

4 Arguments for a uniform consumption tax

Orthogonal to the overall level of consumption taxation is the question of whether and how consumption taxes should be differentiated across goods (and services). We begin by discussing the arguments in favor of uniform taxation. In particular, based on the seminal theoretical results of [Atkinson and Stiglitz \(1976\)](#) and [Diamond and Mirrlees \(1971\)](#), we argue that differential taxation of consumption creates distortions in consumption and production without generally improving 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 leads to efficiency losses because individuals do not purchase the goods and services they most prefer, but also take taxes into account. In particular, distortions in consumption decisions are caused not only by consumption taxes such as differentiated VAT or sales taxes, but also by excise taxes on, for example, alcohol and tobacco. For differential taxation to be socially desirable, the gains from the differentiated tax structure must exceed the distortions in consumption choices.

Provided that the government has access to progressive (nonlinear) income taxation and can direct transfers to households, differential taxation distorts consumption profiles without generally improving the feasibility of redistribution. Differential consumption taxation should then be avoided, as shown in the seminal contribution of [Atkinson and Stiglitz \(1976\)](#). More specifically, the authors show that in the absence of internalities and externalities (which will be discussed in the next section), *all goods and services should be taxed at the same rate* if the following two assumptions are met: (i) the consumption preferences of individuals are unrelated to their ability to earn income, and (ii) there is no connection between labor supply and the goods and services that individuals consume.²² Several comments are in order. First, in the model of [Atkinson and Stiglitz](#), uniform taxation of consumption is equivalent to not taxing consumption at all (and adjusting income taxes accordingly). Second, [Atkinson and Stiglitz](#) analyze consumption taxes that are allowed to be nonlinear. However, the main result is unchanged when attention is restricted to linear consumption taxes (see, for example, [Edwards et al., 1994](#); [Jacobs and Boadway, 2014](#)). Third, [Atkinson and Stiglitz](#) assume that the tax on

²¹Then why are progressive taxes on labor income feasible? The reason is that the tax authority can rely on third-party information from employers about individuals' sources of income. It is difficult for an individual with a high marginal tax rate to persuade his employer to transfer part of his labor income to a colleague with a lower marginal tax rate (and to persuade the colleague to pass on the extra income) as part of a tax avoidance scheme.

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

labor income is nonlinear. Deaton (1979) shows a closely related result in a model with linear income taxes under the additional constraint of linear Engel curves for consumption.²³

Of course, there are many goods and services that violate the strict assumption of the above theorem (which will be discussed in the next section). Nevertheless, 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 what extent they are consumed by poor or rich households, since uniform taxation is shown to be optimal regardless of these measures.²⁴ Importantly, consumption taxes should not be used to achieve distributional goals because it is more efficient to redistribute through the income tax system.²⁵ An important qualification, however, is that the government must be able to freely adjust the income tax paid (or transfer received) at each income level. In real economies, practical and political considerations limit the extent to which the income tax can be adjusted and thus the extent to which 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 distorts the production decisions of firms. Before the widespread adoption of value-added taxation, it was common to have sales taxes that applied to all sales, regardless of whether the sales were to firms or to final consumers.²⁶ In such a situation, differential taxation of goods and services distorts not only consumption decisions but also production decisions. In addition, so-called cascading effects occur when goods are produced in several stages by different firms and the tax is levied at each stage of production – a process that can lead to inefficient tax-driven decisions to produce in-house in order to eliminate the intermediate stages of production.

Modern consumption taxes are often designed so that they do not affect transactions between firms. In the case of value-added tax (VAT), firms pay a proportional tax on their sales, but are compensated for the VAT they pay on their inputs. The VAT is therefore not a cost to their business and the tax is passed on to the final consumer. VAT has the advantage that busi-

²³See also Boadway and Cuff (2022).

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

²⁵The result can be understood on the principle that the fundamental constraint on tax policy is information. The government would like to redistribute from individuals with high ability to individuals with low ability, but cannot observe these abilities and must 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 improving redistribution.

²⁶Note that tax arbitrage limits the ability to condition sales taxes on the type of purchaser.

nesses do not have to keep track of whether they sell to businesses or consumers. However, the U.S. sales tax, while directed at consumer sales, does not have the property of being production neutral. Ring (1999) estimates that up to 40 percent of the retail sales tax in the US is actually borne by businesses.

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

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 taxing production inputs. Their result is based on the observation that differential taxes on inputs not only distort firms' production decisions, but also change consumer prices and thus distort consumption. Imposing uniform taxes on production factors and differentiating taxes on consumption goods can produce the same consumer prices and achieve a Pareto improvement, since the distortions are limited to consumption choices.

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

Regarding the first assumption, Dasgupta and Stiglitz (1972) show that inputs 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 rates to extract economic rents.

²⁷The situation is further complicated by the fact that some firms operate in both exempt and non-exempt sectors. There are also sectors that have a so-called qualified exemption, which means that they charge 0% VAT on their sales, but are still entitled to compensation for the VAT paid on inputs (e.g. the pharmaceutical industry).

²⁸Firms that benefit from VAT exemptions are mainly those that sell directly to consumers and have few processing steps in their production, as this allows them to obtain lower prices for their goods and services. VAT exemptions are mainly detrimental to firms in the middle of production chains that sell their products to firms subject to VAT, which can lead to higher prices for final consumers, especially if there are many processing steps involved. Thus, VAT exemptions not only distort firms' production decisions, but also spill over into consumer prices, causing additional distortions in consumption.

²⁹The literature also contains other violations of the production efficiency principle. In particular, Naito (1999) studies an economy in which low-skilled and high-skilled labor are combined to produce goods in different sectors of production. If the taxation of goods favors sectors of the economy that rely more on low-skilled labor, and the two types of labor are imperfect substitutes in production, the wages of low-skilled workers will rise 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 thus contributes to distributional goals at a low efficiency cost.

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 obvious that some consumption goods cannot be taxed for practical reasons or due to legal constraints. In these 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 must be weighed against the distortions introduced in production. Financial services are an important example. In the context of VAT, it is difficult to define the value added associated with financial services. If value-added taxation is difficult, a sector-specific wage tax may be an alternative. Such a tax would raise the price of financial services and thus contribute to a more uniform consumption tax (an efficiency gain). At the same time, too few people would be hired in the financial sector, which is an efficiency loss.³⁰

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

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

4.3 The political economy of consumption taxation

The third argument in favor of uniform consumption taxation concerns the political economy of taxation. Uniform taxes make the tax system less vulnerable to pressure from special interest 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 spent by interest groups and politicians to create and manage such pressure is a waste from a societal point of view.

However, despite this widespread argument, empirical experience tells us that uniform consumption taxation is difficult to maintain. In Sweden, for example, one of the objectives of the

³⁰Relatedly, financial firms may replace domestic personnel with personnel hired abroad.

major tax reform of 1991 (also known as the “tax reform of the century”, which introduced dual income taxation) was to promote uniform consumption taxation. However, it did not take many years for several deviations from uniformity to occur; see [Agell et al. \(1995\)](#). A possible explanation for 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 ultimately the progressivity of the overall tax system that matters). This misconception 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 groups of voters tend to gain political support easily if voters neglect the necessary adjustments in government spending or other taxes. Relatedly, consumption tax cuts may be more salient and easier to understand than, say, income tax changes, especially for young voters with less experience with the tax system.

4.4 Avoiding arbitrary redistribution

The fourth argument against differential consumption taxation is that it leads to arbitrary and hard-to-measure redistribution across individuals in society. In particular, differential consumption taxes redistribute across individuals with identical incomes but different consumption preferences, violating the principle that ability to pay should guide the design of the tax system. In addition, because consumption taxes affect wages (and other input prices) throughout the production chain through pass-through effects, differential consumption taxes create indirect gains for workers and stakeholders in some sectors at the expense of others. Individuals who benefit do so because they happen to work in the right sectors, not because they truly deserve a lower tax.

4.5 Administrative simplicity

Another argument is that differential consumption taxation leads to costly delineation problems. For example, if a reduced rate is applied to leisure services, the question arises as to what should be considered a leisure service. In most countries with differential rates, one can compile a long list of court cases analyzing the delineation involved in applying the rates. The resources that society devotes to classifying different consumption goods for tax purposes are a waste that can be avoided by adopting a uniform consumption tax. Moreover, in some cases the boundaries between categories have to be drawn in a way that may cause disagreement among economic actors, potentially leading to frustration and ultimately to a reduction in the perceived legitimacy of the tax system.

5 Arguments for differentiated consumption taxation

Most countries tax at least some goods and services at different rates through excise taxes and/or differentiated VAT or sales taxes, and there are sometimes strong economic arguments for doing so. This section discusses the main arguments in favor of differential consumption taxation.

A widespread justification for tax differentiation exists for goods and services associated with externalities or internalities. Here, differential taxes can improve economic efficiency by incorporating neglected costs and benefits into consumer prices and by 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, professional expenses, child care, and other household services.

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

5.1 Externalities

The most obvious reason to deviate from a uniform consumption tax is when certain goods generate positive or negative externalities. We will only briefly discuss the case of externalities here, since they are fairly well understood reasons for differential consumption taxes.

Without government intervention, the prices of goods and services faced by consumers will reflect only the direct costs of production, not the external social costs that result from their production and consumption. If the external costs are positive, consumption will be inefficiently high unless the government corrects the choices through taxation (or regulation). To restore efficiency, [Pigou \(1920\)](#) shows that the optimal tax on the consumption of a good that produces a negative externality should be equal to the social damage of one additional unit produced and consumed.³¹ Such a tax raises the prices *post-tax* that consumers face and sets them at a level that reflects not only the private cost of an additional unit, but also the social cost.

One limitation of the classical Pigouvian analysis is that it abstracts from taxes that are necessary for reasons other than externalities. In particular, it does not take into account distortionary taxes needed to raise funds for public spending and/or income redistribution. [Sandmo \(1975\)](#) extends the analysis of externalities to cases where the government uses other, linear taxes to meet a revenue requirement. He shows that the marginal social harm affects only the tax formulas for the externality producing good, but not for other goods. This is an important result because it shows that the Pigouvian principle extends to second-best settings with dis-

³¹For example, if the production of one liter of fuel and its combustion in the engine of a car emits 3 kilograms 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 liter.

tortionary taxation. In particular, it suggests that the design of environmental taxation can be separated from the design of other areas of taxation.

However, Sandmo (1975) considers only proportional taxes on goods and services and abstracts from the possibility of nonlinear income taxes. Subsequent studies with nonlinear income taxes confirm the general principle that externality-based terms are present only in the tax formulas for goods that generate those externalities. However, these studies also find that the entire tax system is shaped by considerations related to the design of the income tax (see Pirttilä and Tuomala, 1997, for example). Therefore, the Pigouvian principle of taxing goods in proportion to their marginal social harm must be generalized beyond the direct mechanical effect of externalities. For example, externalities may support redistributive policies (e.g., when pollution reduces the value of leisure), and then more lenient taxation of externalities would be advisable. In other words, the design of environmental taxes and the design of income taxes are generally inseparable.

Despite the subtle interplay between environmental taxation and income and consumption taxation, the policy debate is often dominated by a stylized link 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 the form of environmental benefits and an indirect dividend in the form of increased efficiency of the tax system. The increased efficiency of the tax system is realized by means of a *green tax reform*, which uses the tax revenues from environmental taxes to lower other taxes that are perceived as harmful, such as taxes on labor. With this goal in mind, environmental taxes can be set higher than those motivated by purely environmental considerations. However, there are four main problems with this type of argument.

1. Environmental taxes do not target a long-term sustainable tax base. As environmentally harmful activity declines, so does tax revenue.
2. Environmental taxes, like most taxes, discourage labor supply. Thus, the combined effect of a green tax change does not necessarily increase incentives to work.
3. Green tax changes often have undesirable distributional consequences. While the burden of income tax is broadly distributed across the working population, environmental taxes fall most heavily on individuals who find it hardest to adjust their consumption in an environmentally friendly way (e.g., individuals living in rural areas who are dependent on their cars).
4. Environmental taxes raise a very small share of total tax revenue compared to taxes on labor. Thus, to make a substantial change in green taxes, the government would have to raise existing environmental taxes dramatically or find new tax bases.

Another constraint on the government's ability to implement green tax changes is the risk that environmentally harmful activities will move abroad. In particular, firms may relocate

production to countries with lower or even zero taxes on emissions. This "extensive margin" threatens to increase global emissions and impose additional idiosyncratic costs on the domestic country in the form of reduced employment and lost tax revenues. Since environmental taxes are often targeted at firms, they are subject to tax competition between countries, just like corporate income taxes. Successful environmental tax reform therefore requires coordination between countries.

5.2 Internalities

Internalities refer to situations in which individuals make decisions that do not maximize their own welfare. In a sense, an externality is an externality that an individual imposes on himself. The empirical evidence for internalities is ubiquitous. Many studies in behavioral economics document that individuals tend to overconsume certain goods and services due to problems of self-control or misperceptions of the utility of different types of consumption (e.g., due to information frictions).

Thus, internalities seem to motivate differentiated consumption taxation for similar reasons as in the case of externalities. However, differentiated consumption taxation is controversial in this context because it is based on the idea that the government understands individual welfare better than the individuals themselves. This can be seen as paternalistic and a violation of the right of individuals to make their own decisions. Another question is whether government intervention is really necessary or whether private markets can come up with solutions on their own to combat internalities. For example, thousands of mobile apps have been developed in recent years to help individuals deal with various self-control problems.³² Thus, internalities are a weaker argument for differential consumption taxation than externalities. One reason is certainly that individuals are better informed about the consequences of their behavior on their own well-being than they are about the consequences on the well-being of others.

One area that has been much discussed in recent years is the consumption of sugary products such as candy and soft drinks. An externality arises when individuals do not fully consider how their current sugar consumption will affect their future health. Several countries have introduced or plan to introduce regulations and taxes to reduce sugar consumption. A particular focus has been on sugar-sweetened beverages. By mid-2020, more than 40 countries will impose specific taxes on sugar-sweetened beverages ([Global Food Research Program, 2020](#)).

Another example of internality is energy-efficient goods, such as energy-efficient refrigerators, which tend to be underconsumed because they are expensive up front, but which result in lower electricity bills, creating individual economic benefits that add up in the long run (beyond their environmental benefits).

Interestingly, consumption that is characterized by internalities often generates externalities for society. For example, sugar consumption imposes costs not only on the individual but also

³²For example, there are many widely used apps designed to help individuals reduce smartphone use, quit smoking, lose weight, exercise more regularly, and so on.

on society in the form of tax-financed health care bills.³³ Similarly, energy efficient products not only reduce individual electricity bills, but also lead to reduced carbon dioxide emissions (see e.g. [Allcott et al., 2014](#)). Thus, there is often a dual rationale for using fiscal instruments to correct for externalities.

As with externalities, when taxes are used to address internalities, there are unintended distributive effects that can be difficult to neutralize. For example, goods with high sugar content (which the government would like to tax for internalities) tend to be consumed more by low-income households. Similarly, goods that are energy efficient (which the government would like to subsidize for internal reasons) tend to be consumed more by high-income individuals. Therefore, internality-induced taxes and subsidies are often regressive. An important insight, however, is that if the behavioral distortions are greater for low-income households, then the corrective benefits of these interventions will accrue to a greater extent to 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:³⁴

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. The size of the health gains from behavioral changes in different income groups.
4. The extent to which tax revenues from sugar taxes can be used to partially offset the regressive distribution of the tax burden of sugar taxes.
5. The external effects of sugar consumption on society as a whole, for example, in terms of additional health care costs.

Furthermore, in a survey article, [Allcott et al. \(2019b\)](#) present a number of guiding principles for policymakers regarding sugar taxes. Their first message is that sugar taxes should be designed to maximize social welfare, not to minimize sugar consumption. If the goal were to minimize sugar consumption, the government should simply ban the consumption of unhealthy foods such as soda. However, this perspective does not take into account the utility that consumers derive from unhealthy foods and how such a ban would affect producers. Instead, taxes

³³When health care is publicly financed, as it is in many countries, unhealthy consumption choices have consequences for public spending. Therefore, taxes on unhealthy foods are easier to motivate in countries where health care is publicly financed than in countries where individuals must pay for their own health care. Taxes on goods with adverse health effects can thus be seen as additional insurance premiums that must be paid to compensate the government for increased expected future health care costs.

³⁴Based 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 low-income American households consume about 100 liters of sugary drinks per year, while high-income households consume only 50 liters per year. Another important area where internalities appear to be large is the case of lotteries; see [Lockwood et al. \(2021\)](#) for a recent paper.

should be set to correct for market imperfections resulting from internalities and externalities. Another message is that public policy should seek to reduce consumption in those populations that generate the greatest externalities and internalities. For this reason, it is particularly desirable to reduce sugar consumption among children, since habits established early in life may persist in the long run. Furthermore, taxes to combat internalities should be levied as close to the source as possible. Thus, the ideal tax would be on sugar itself and not, for example, on the amount of soda consumed.

In summary, we conclude that there are good reasons for taxes on unhealthy foods such as sugar, as well as 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 across countries or bordering states is bound to be unsuccessful.³⁵

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 the supply of labor and the consumption of certain goods and services. If some consumption goods affect preferences for work, the second assumption of the Atkinson-Stiglitz theorem is not satisfied (see section 4.1), and 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 time can reduce the distortions associated with (nonlinear) taxation of labor income and thereby facilitate redistribution. This result is reminiscent of the classic result of Corlett and Hague (1953), who argued that goods that are complementary to leisure should bear higher tax rates than other goods, although the underlying logic is somewhat different.³⁶

By this reasoning, goods such as golf clubs or fishing tackle should be taxed at higher rates because they are complementary to leisure. However, this type of tax differentiation is not widespread in practice—perhaps for political reasons, as such taxes would be unpopular. An alternative explanation is that individuals would not actually work more hours if leisure goods were taxed more heavily. Perhaps the only effect of such taxes would be that individuals would enjoy their leisure time less. Ultimately, it is an empirical question to what extent taxes on leisure goods can help strengthen incentives to work. Empirical evidence on this question remains scarce.

However, there are many practical examples where goods that are *complements of labor*

³⁵The Norwegian experience illustrates this. Following a sharp increase in taxes on sugary products in 2018, cross-border shopping to Sweden increased significantly. The taxes were reduced to their previous level in 2020.

³⁶The Corlett-Hague result builds on the representative agent framework of linear taxation developed by Ramsey (1927), while 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 relationship between the “new” results and the classical result of Corlett and Hague (1953).

supply are subsidized. These are 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 is a precondition for the labor supply of parents with young children. When child care is subsidized and the subsidies are financed by tax revenues, the increase in labor supply not only raises parents' incomes but also allows families to benefit more from a subsidized service (and implicitly recoup some of the taxes paid). This double benefit encourages the labor supply of individuals who are subject to progressive income taxation. Thus, the policy helps to reduce the adverse effects of taxes on labor supply and thus facilitates redistribution.³⁷

A number of recent studies have attempted to quantify the welfare gains from subsidized child care. These studies show that the optimal type of subsidy depends on the information that the government can observe at a reasonable cost. Because it is difficult for the government to monitor the exact number of hours a child spends in child care (because it can lead parents or child care centers to misreport hours), it is most common to subsidize child care in terms of associated expenditures rather than hours. It is important to note that child care expenditures can be subsidized in many different ways, such as through a tax deduction, a tax credit, or reduced rates for publicly provided care.

[Bastani et al. \(2020\)](#) study how to subsidize child care when the government is simultaneously optimizing a nonlinear income tax.³⁸ They point out that those who work more hours and demand more child care do not necessarily have higher child care expenditures than those who work fewer hours. For example, well-educated parents with high wages may choose to work part-time while consuming high-quality child care at an expensive hourly rate.³⁹ The authors argue that the gains from subsidized child care are likely to be largest in markets where the quality of child care is relatively homogeneous and price variation is not large. Moreover, publicly provided care with standardized quality may be a particularly efficient way to subsidize child care.⁴⁰

There is also a debate about the extent to which childcare subsidies should be means-tested. Note that the way subsidies are provided can affect households very differently depending on their income: publicly provided services at low prices generate identical cost savings for all

³⁷The major review of the tax system in the United Kingdom, led by James Mirrlees ([Mirrlees et al., 2011](#)), recommended that goods and services be taxed uniformly - with the exception of child care services, which should be subsidized relative to other goods.

³⁸[Bastani et al. \(2019\)](#) analyze the subsidization of child care under less sophisticated tax systems, such as linear and piece-wise linear tax systems.

³⁹One reason for this pattern could be that educated parents place a higher value on the human capital formation of the child.

⁴⁰Parents who are dissatisfied with the quality of public child care can choose another facility, but are then forced to pay some or all of the costs themselves. For public provision schemes to be effective, the quality must be perceived as satisfactory so that the majority of the population does not opt out—otherwise individuals would have to pay twice for these services (once through income tax and again through private purchase), with adverse effects on labor supply.

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 \(2020\)](#) examine the income-dependent design of child care subsidies for single mothers and find that a large degree of means testing is optimal. More specifically, they argue that subsidy rates should be very high for earners at the bottom of the income distribution and should decline rapidly with income.

A similar argument can be made for subsidizing elderly care as for child care. Elderly care services may be important to facilitate the labor supply of middle-aged workers (typically 50 and older) with elderly dependents in need of care.⁴¹ So far, the labor supply effects of elderly care and the benefits of subsidized care have received relatively little attention in the research literature.⁴²

5.3.2 Household services, maintenance and repairs

Non-care household services such as cleaning, gardening, home repairs and maintenance are another important example of services related to labor supply. Similar to child care and elderly care, these services can either be produced by the household or purchased on the market. When individuals work in their own households, they do not earn formal income and do not pay 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. Thus, income taxation discourages formal work and hinders specialization in the tasks for which individuals are best qualified. A subsidy for domestic services can counteract these problems. Thus, similar to care services discussed above, subsidies to household services reduce the distortions caused by income taxation and allow redistribution at a lower efficiency cost.

Although household services may not be as closely related to labor supply as child care, they are relevant to a much larger group of individuals (not just families with young 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 through an income tax system that allows nonlinear deductions for expenditures on household services.⁴³

Sometimes subsidies for household services are justified on the grounds that they reduce the size of the informal economy and reduce long-term unemployment by increasing the number of formal low-skilled jobs. While these seem relevant goals, it is not obvious that consumption taxes should be used to achieve them, as there may be better, more direct instruments to achieve these goals. Subsidies for household services still distort individual consumption choices and can lead to arbitrary redistribution between groups (for example, based on where individuals

⁴¹Although long-term care policies are often studied in models with asymmetric information, the informational frictions are typically quite different from the Mirrleesian approach to nonlinear income taxation ([Mirrlees, 1971](#)). See [Jousten et al. \(2005\)](#), [Cremer and Roeder \(2013\)](#) and [Cremer and Pestieau \(2014\)](#).

⁴²See [Lilly et al. \(2007\)](#) for an overview and [Løken et al. \(2017\)](#) for a more recent contribution.

⁴³Earlier studies of optimal taxation with household production include [Anderberg and Balestrino \(2000\)](#), [Kleven et al. \(2000\)](#), [Cremer and Gahvari \(2015\)](#), and [Olovsson \(2015\)](#).

live or how much they value a clean home rather than their ability to pay taxes). Another side effect is that subsidies for household services subsidize not only the consumers but also the producers of those services.⁴⁴

5.4 Heterogeneous consumption preferences

The [Atkinson and Stiglitz \(1976\)](#) result discussed in section 4.1 assumed that all individuals have the same consumption preferences and that earning ability is the only dimension on 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 \(2008\)](#), [Kaplow \(2008\)](#), [Golosov et al. \(2013\)](#), [Gordon and Kopczuk \(2014\)](#), [Gauthier and Henriët \(2018\)](#), and [Allcott et al. \(2019a\)](#), [Spiritus \(2022\)](#) among others. In settings where individuals differ not only in their ability to earn but also in their consumption preferences (and there is some relationship between them), differential consumption taxation typically increases social welfare in two ways. First, it allows the government to increase the total amount of redistribution 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 earning 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 will generally be the case if there is a relationship between ability to earn and consumption preferences. By taxing goods that are preferred by high-ability individuals, the government achieves redistribution conditional on labor income, thereby increasing the overall redistribution of the tax system.⁴⁵

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, say lobster and champagne, than low-ability individuals (even conditional on income). If the tax system shifts part of the tax burden from income tax to taxes on lobster and champagne consumption, the welfare of low ability individuals is largely unaffected, but it becomes significantly less attractive for high ability individuals to have a low income, since their lifestyle 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.

⁴⁴Sometimes subsidies for household services are criticized on the grounds that they mainly benefit high-income households. However, this is not a relevant criticism because distributional concerns can be addressed by adjusting the income tax system accordingly (see [Koehne and Sachs, 2022](#)).

⁴⁵These results bear some resemblance to the findings of [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.

Despite the theoretical justifications above, heterogeneity in preferences is not a strong argument for differentiated consumption taxation because empirical knowledge of 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.⁴⁶ 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 at the same time it is possible to relate these differences to verifiable personal attributes (such as age), then it is better to base the income tax system directly on these attributes instead.⁴⁷ In this way, distortions in individual consumption decisions can be avoided. Finally, given that consumption preferences are likely to have a low 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 are not a compelling reason for differentiated consumption taxes.

5.5 Wealth differences and non-homothetic preferences

A subtle case for differential consumption taxation arises when there are differences in disposable income between individuals with the same pre-tax labor income and these differences are related to earning capacity. Such a pattern can arise, for example, if, among individuals with the same labor income, those with high earning ability are more likely to have inherited wealth or to receive transfers from a partner or other family members. In such situations, holding labor income constant, high-skilled individuals will have more resources available for consumption than low-skilled individuals. This implies that, among individuals earning the same labor income, high-skilled individuals will demand goods and services differently than low-skilled individuals, and therefore, similar to the previous subsection, differential consumption taxation can discourage high-skilled agents from reducing their labor income in response to progressive taxation of labor income. More specifically, it will be optimal to impose higher tax rates on goods that are disproportionately preferred by individuals with high disposable income.⁴⁸ 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.⁴⁹ In other words, income elasticities of demand become relevant for the determination

⁴⁶[Bastani and Waldenström \(2021\)](#) address this problem by studying an empirical setting with a kinked budget set, where individuals with different earning abilities are pooled at the same income level (at the kink point of the labor income tax in Sweden). They show that 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 along the same principle as in the text.

⁴⁷Typically, income taxes can be tied to the identity of individuals and thus can be related to such attributes, whereas consumption taxes are usually assumed to be anonymous and thus cannot be tied to individual attributes.

⁴⁸The 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.

⁴⁹The result depends on what the incentive problems look like with respect to the two-dimensional distribution of ability and wealth. The simplest case is obtained by assuming a perfect correlation between ability and wealth.

of optimal consumption tax rates even though the government has access to nonlinear labor income taxation.⁵⁰

An important observation is that the differences in consumption patterns described above are due to differences in wealth, not differences in preferences. Unlike preferences, wealth is taxable. Therefore, it would be more efficient to tax wealth itself, which is the source of the difference in consumption behavior, than to differentiate consumption taxes, which distorts individuals' consumption choices. However, there are usually strong practical and political obstacles to taxing wealth.

5.6 Relative consumption concerns

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

In general, it is difficult to assess whether relative consumption concerns motivate differential consumption taxation because it is difficult to identify the goods that are subject to the most intense status comparisons. Another aspect is that the goods used in status races may change over time, and taxing a good that is considered positional today may cause other goods to become positional tomorrow. There are other problems as well. A well-known example is the luxury tax on yachts in the United States in the 1990s, which eliminated many jobs in the domestic yacht industry and was repealed in 1993.⁵¹

For these 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 luxuries. This will also be the ideal policy response if consumers care mainly about how their total income or total consumption compares to the income or consumption of relevant reference persons.⁵²

⁵⁰This mechanism was first explored by [Cremer et al. \(2001, 2003\)](#). A similar result was presented by [Bastani et al. \(2014\)](#) in the context of childcare services. Highly skilled individuals who work fewer hours to reduce their taxable income (to lower their tax burden) need to purchase fewer hours of child care and will therefore have higher disposable income than low-skilled individuals earning the same labor income (provided that individuals with high skills and low labor supply do not purchase 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 reductions in working hours, thereby improving the efficiency of the tax system.

⁵¹See [Salpukas \(1992\)](#).

⁵²How status concerns affect the optimal design of income taxation is studied by [Persson \(1995\)](#) and [Aronsson and Johansson-Stenman \(2008\)](#), among others. [Bastani et al. \(2023\)](#) is a recent paper that studies optimal commodity taxation when goods serve signaling purposes, showing that by curbing the conspicuous consumption of the wealthy, the government renders signaling less informative and increases the share of the social status surplus derived by the less wealthy.

5.7 Education

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

Education belongs to a category of consumer goods sometimes referred to as *merit goods*, which refers to goods and services that the government subsidizes because they are thought to have positive internalities or externalities for society. Merit goods can also refer to goods and services that society believes all individuals should have access to (such as emergency health care), according to a principle sometimes referred to as *commodity egalitarianism*.

How education should be subsidized is a complex question that cannot be fully addressed here.⁵³ 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 (one possibility is certainly that individuals overconsume education relative to other goods), and (ii) there are reasons to subsidize education to counteract the distortions associated with progressive income taxation, since such taxation reduces the incentive to invest in education (see [Bovenberg and Jacobs, 2005](#)).⁵⁴

5.8 Housing

The largest consumption good for most individuals is housing. The taxation of housing is one of the most complex areas of tax research because housing serves as both an investment and a consumption good. Moreover, the flow of consumption from housing—as from other durable goods—is dynamic and affected by mechanisms (e.g., adjustment frictions) that are markedly different from those for non-durable goods. Given these difficulties, a comprehensive analysis of housing seems unfeasible, and research tends 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](#)).⁵⁵

[Koehne \(2018\)](#) shows that durable consumption goods justify differential taxes even when 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 difficult to predict be-

⁵³Recent 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. \(2021\)](#).

⁵⁴At the same time, it is possible that the progressive income tax system in combination with the social transfer system encourages riskier investments in human capital.

⁵⁵See also [Parodi \(2021\)](#), who studies the taxation of durable goods focusing on non-housing consumption.

cause they depend on details of individual preferences (e.g., non-separability 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 example, it is sometimes claimed that those who own their homes take better care of them and are more likely to contribute positively to the residential area in which they live, which is an argument for taxing housing less than other goods (see e.g. [Rossi-Hansberg and Sarte, 2012](#)). In addition, housing may be a consumption good that is consumed relatively more by high ability individuals, although the evidence is not entirely conclusive.

It is not obvious that these arguments for tax differentiation can justify the large tax privileges for housing found in many countries.⁵⁶ Assessing the benefits and costs of tax differentiation for housing remains a challenging issue and requires breakthroughs in modeling consumption, investment, labor supply, and the housing market simultaneously.

6 Conclusion

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

With respect to the appropriate level of taxation, we have shown that consumption taxes share many similarities with income taxes. However, we have shown that consumption taxes differ from the latter by imposing an additional tax burden on wealth, on excess returns to capital, and on unreported income. Moreover, consumption taxes limit the gains from tax planning attempts when individuals shift income between different tax bases. In our view, these mechanisms motivate a substantial role for consumption taxes in the overall tax mix. Exactly how much reliance should be placed on consumption taxes, however, remains an important open question. Although the current state of the literature is not close to a definitive answer, the existing results point to several key mechanisms that quantitative approaches should take into account.⁵⁷

Regarding the extent 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 generate externalities (or internalities) or when their demand is closely related to individual labor supply. We have also

⁵⁶Of course, housing is also subject to several taxes, such as transaction taxes and recurrent property taxes. To measure the effective tax burden, these taxes must 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 review of the effective tax burden on housing.

⁵⁷In the macroeconomic literature, numerous contributions have examined 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 between 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.

summarized some additional theoretical justifications for tax differentiation, such as ability-based taxation, non-homothetic preferences, or relative consumption concerns. However, in our view, these cases do not provide a strong argument because the existing empirical evidence is too limited or because alternative tax instruments appear to be more targeted.

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

Finally, we would like to point out a couple of broad areas where we think more research would be particularly valuable. While there is already a rich literature quantifying optimal education subsidies, the literature on optimal housing taxation is currently in 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, dating 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.⁵⁸ A similar gap between theory and quantification exists in the case of work-related tax privileges.⁵⁹ Finally, an important aspect that we have only touched on 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 taxes in developing countries remain scarce.

References

- Adam, S. and Miller, H. (2021). Taxing work and investment across legal forms: pathways to well-designed taxes. The Institute for Fiscal Studies.
- Agell, J., Englund, P., and Södersten, J. (1995). The tax reform of the century: An introduction. *Swedish Economic Policy Review*, 2:219–228.
- Ahsan, S. M. (1989). Choice of tax base under uncertainty: Consumption or income? *Journal of Public Economics*, 40(1):99–134.
- Ahsan, S. M. (1990). Risk-Taking, Savings, and Taxation: A Re-Examination of Theory and Policy. *Canadian Journal of Economics*, 23(2):408.
- Ahsan, S. M. and Tsigaris, P. (1998). The design of a consumption tax under capital risk. *Journal of Economics*, 68(1):53–78.

⁵⁸[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.

⁵⁹See [Koehe and Sachs \(2022\)](#) for a first attempt to quantify tax deductions for household services.

- Allcott, H., Lockwood, B. B., and Taubinsky, D. (2019a). Regressive Sin Taxes, with an Application to the Optimal Soda Tax. *Quarterly Journal of Economics*, 134(3):1557–1626.
- Allcott, H., Lockwood, B. B., and Taubinsky, D. (2019b). Should We Tax Sugar-Sweetened Beverages? An Overview of Theory and Evidence. *Journal of Economic Perspectives*, 33(3):202–227.
- Allcott, H., Mullainathan, S., and Taubinsky, D. (2014). Energy policy with externalities and internalities. *Journal of Public Economics*, 112:72–88.
- Alpizar, F., Carlsson, F., and Johansson-Stenman, O. (2005). How much do we care about absolute versus relative income and consumption? *Journal of Economic Behavior & Organization*, 56(3):405–421.
- Altig, D., Auerbach, A. J., Koltikoff, L. J., Smetters, K. A., and Walliser, J. (2001). Simulating fundamental tax reform in the united states. *American Economic Review*, 91(3):574–595.
- Anderberg, D. and Balestrino, A. (2000). Household Production and the Design of the Tax Structure. *International Tax and Public Finance*, 7(4/5):563–584.
- Aronsson, T. and Johansson-Stenman, O. (2008). When the Joneses' consumption hurts: Optimal public good provision and nonlinear income taxation. *Journal of Public Economics*, 92(5-6):986–997.
- Atkinson, A. B. and Stiglitz, J. E. (1976). The design of tax structure: Direct versus indirect taxation. *Journal of Public Economics*, 6(1-2):55–75.
- Bachas, P., Gadenne, L., and Jensen, A. (2022). Informality, consumption taxes and redistribution. Working Paper, World Bank Research.
- Banks, J. and Diamond, P. (2010). The base for direct taxation. In *Dimensions of Tax Design: The Mirrlees Review*, pages 548–648. Oxford University Press.
- Bastani, S. (2021). *Hur bör konsumtion beskattas?* SNS Förlag, Stockholm.
- Bastani, S. (2022). Perspektiv på konsumtionsbeskattning. IFAU Working Paper 2022:10, Institute for Evaluation of Labour Market and Education Policy.
- Bastani, S., Blomquist, S., and Micheletto, L. (2019). Nonlinear and piecewise linear income taxation, and the subsidization of work-related goods. *International Tax and Public Finance*, 26:806–834.
- Bastani, S., Blomquist, S., and Micheletto, L. (2020). Child Care Subsidies, Quality, and Optimal Income Taxation. *American Economic Journal: Economic Policy*, 12(4):1–37.
- Bastani, S., Blomquist, S., and Pirttilä, J. (2014). How should commodities be taxed? A counter-argument to the recommendation in the Mirrlees Review. *Oxford Economic Papers*, 67(2):455–478.
- Bastani, S., Blumkin, T., and Micheletto, L. (2023). Taxes and the division of social status. *Dondena Working Paper No. 156, The Dondena Centre, Bocconi University*.
- Bastani, S. and Waldenström, D. (2020). How should capital be taxed? *Journal of Economic Surveys*, 34(4):812–846.

- Bastani, S. and Waldenström, D. (2021). The ability gradient in tax responsiveness. *Journal of Public Economics Plus*, 2:100007.
- Benzarti, Y., Carloni, D., Harju, J., and Kosonen, T. (2020). What Goes Up May Not Come Down: Asymmetric Incidence of Value-Added Taxes. *Journal of Political Economy*, 128(12):4438–4474.
- Blomquist, S. and Christiansen, V. (2008). Taxation and Heterogeneous Preferences. *Finanzarchiv*, 64(2):218–244.
- Boadway, R. and Cuff, K. (2022). *Tax Policy: Principles and Lessons*. Elements in Public Economics. Cambridge University Press.
- Boadway, R., Marchand, M., and Pestieau, P. (1994). Towards a theory of the direct-indirect tax mix. *Journal of Public Economics*, 55(1):71–88.
- Bohacek, R. and Kapicka, M. (2008). Optimal human capital policies. *Journal of Monetary Economics*, 55(1):1–16.
- Borri, N. and Reichlin, P. (2021). Optimal taxation with home ownership and wealth inequality. *Review of Economic Dynamics*, 40:64–84.
- Bovenberg, A. L. and Jacobs, B. (2005). Redistribution and education subsidies are Siamese twins. *Journal of Public Economics*, 89(11-12):2005–2035.
- Christiansen, V. (1984). Which commodity taxes should supplement the income tax? *Journal of Public Economics*, 24(2):195–220.
- Christiansen, V. and Smith, S. (2021). *Economic Principles of Commodity Taxation*. Elements in Public Economics. Cambridge University Press.
- Cnossen, S. and Jacobs, B., editors (2020). *Tax by Design for the Netherlands*. Oxford University Press.
- Colas, M., Findeisen, S., and Sachs, D. (2021). Optimal need-based financial aid. *Journal of Political Economy*, 129(2):492–533.
- Conesa, J. C., Li, B., and Li, Q. (2020). Welfare implications of switching to consumption taxation. *Journal of Economic Dynamics and Control*, 120:103991.
- Corlett, W. J. and Hague, D. C. (1953). Complementarity and the Excess Burden of Taxation. *Review of Economic Studies*, 21(1):21–30.
- Crawford, I., Keen, M., and Smith, S. (2010). Value added tax and excises. In *Dimensions of Tax Design: The Mirrlees Review*, pages 275–362. Oxford University Press.
- Cremer, H. and Gahvari, F. (2015). Atkinson and Stiglitz theorem in the presence of a household production sector. *Economics Letters*, 126:91–95.
- Cremer, H. and Pestieau, P. (2014). Social long-term care insurance and redistribution. *International Tax and Public Finance*, 21(6):955–974.
- Cremer, H., Pestieau, P., and Rochet, J.-C. (2001). Direct Versus Indirect Taxation: The Design of the Tax Structure Revisited. *International Economic Review*, 42(3):781–800.

- Cremer, H., Pestieau, P., and Rochet, J.-C. (2003). Capital income taxation when inherited wealth is not observable. *Journal of Public Economics*, 87(11):2475–2490.
- Cremer, H. and Roeder, K. (2013). Long-term care policy, myopia and redistribution. *Journal of Public Economics*, 108:33–43.
- Dasgupta, P. and Stiglitz, J. (1972). On Optimal Taxation and Public Production. *Review of Economic Studies*, 39(1):87.
- de la Feria, R. and Walpole, M. (2020). The Impact of Public Perceptions on General Consumption Taxes. *British Tax Review*, 67(5):637–669.
- Deaton, A. (1979). Optimally uniform commodity taxes. *Economics Letters*, 2(4):357–361.
- Diamond, P. and Saez, E. (2011). The case for a progressive tax: from basic research to policy recommendations. *Journal of Economic Perspectives*, 25(4):165–90.
- Diamond, P. and Spinnewijn, J. (2011). Capital Income Taxes with Heterogeneous Discount Rates. *American Economic Journal: Economic Policy*, 3(4):52–76.
- Diamond, P. A. (1975). A many-person Ramsey tax rule. *Journal of Public Economics*, 4(4):335–342.
- Diamond, P. A. and Mirrlees, J. A. (1971). Optimal Taxation and Public Production I: Production Efficiency. *American Economic Review*, 61(1):8–27.
- Edwards, J., Keen, M., and Tuomala, M. (1994). Income Tax, Commodity Taxes and Public Good Provision: A Brief Guide. *FinanzArchiv*, 51(4):472–487.
- Eerola, E. and Määttänen, N. (2013). The optimal tax treatment of housing capital in the neoclassical growth model. *Journal of Public Economic Theory*, 15(6):912–938.
- Fagereng, A., Guiso, L., Malacrino, D., and Pistaferri, L. (2020). Heterogeneity and persistence in returns to wealth. *Econometrica*, 88(1):115–170.
- Farhi, E., Gopinath, G., and Itskhoki, O. (2013). Fiscal Devaluations. *Review of Economic Studies*, 81(2):725–760.
- Feldstein, M. (2002). Commentary: Is there a role for discretionary fiscal policy? *Rethinking Stabilization Policy*, pages 151–162.
- Findeisen, S. and Sachs, D. (2016). Education and optimal dynamic taxation: The role of income-contingent student loans. *Journal of Public Economics*, 138:1–21.
- Frank, R. (2016). *Success and Luck: Good Fortune and the Myth of Meritocracy*. Princeton University Press, Princeton.
- Gahvari, F. and Micheletto, L. (2016). Capital income taxation and the Atkinson–Stiglitz theorem. *Economics Letters*, 147:86–89.
- Gauthier, S. and Henriët, F. (2018). Commodity taxes and taste heterogeneity. *European Economic Review*, 101:284–296.

- Gauthier, S. and Laroque, G. (2009). Separability and public finance. *Journal of Public Economics*, 93(11-12):1168–1174.
- Gentry, W. M. and Hubbard, R. G. (1997). Distributional Implications of Introducing a Broad-Based Consumption Tax. *Tax Policy and the Economy*, 11:1–47.
- Gerritsen, A., Jacobs, B., Rusu, A. V., and Spiritus, K. (2020). Optimal Taxation of Capital Income with Heterogeneous Rates of Return. CESifo Working Paper 8395.
- Global Food Research Program (2020). Sugary drink taxes around the world. <https://cdr.lib.unc.edu/downloads/jh344005h>.
- Golosov, M., Troshkin, M., Tsyvinski, A., and Weinzierl, M. (2013). Preference heterogeneity and optimal capital income taxation. *Journal of Public Economics*, 97:160–175.
- Gordon, R. H. and Kopczuk, W. (2014). The choice of the personal income tax base. *Journal of Public Economics*, 118:97–110.
- Gordon, R. H. and Nielsen, S. B. (1997). Tax evasion in an open economy: Value-added vs. income taxation. *Journal of Public Economics*, 66(2):173–197.
- Harju, J., Kosonen, T., and Skans, O. N. (2018). Firm types, price-setting strategies, and consumption-tax incidence. *Journal of Public Economics*, 165:48–72.
- Ho, C. and Pavoni, N. (2020). Efficient Child Care Subsidies. *American Economic Review*, 110(1):162–199.
- Jacobs, B. (2013). From optimal tax theory to applied tax policy. *FinanzArchiv/Public Finance Analysis*, pages 338–389.
- Jacobs, B. and Boadway, R. (2014). Optimal linear commodity taxation under optimal non-linear income taxation. *Journal of Public Economics*, 117:201–210.
- Jousten, A., Lipszyc, B., Marchand, M., and Pestieau, P. (2005). Long-term care insurance and optimal taxation for altruistic children. *FinanzArchiv/Public Finance Analysis*, pages 1–18.
- Kapička, M. and Neira, J. (2019). Optimal taxation with risky human capital. *American Economic Journal: Macroeconomics*, 11(4):271–309.
- Kaplow, L. (1994). Taxation and risk taking: A general equilibrium perspective. *National Tax Journal*, 47(4):789–798.
- Kaplow, L. (2008). Optimal Policy with Heterogeneous Preferences. *B.E. Journal of Economic Analysis & Policy*, 8(1).
- Kaplow, L. (2022). Optimal income taxation. Working Paper 30199, National Bureau of Economic Research.
- Kesselman, J. R. (1989). Income tax evasion. *Journal of Public Economics*, 38(2):137–182.
- Kesselman, J. R. (1993). Evasion Effects of Changing the Tax Mix. *Economic Record*, 69(2):131–148.

- Kleven, H., Richter, W. F., and Sørensen, P. B. (2000). Optimal taxation with household production. *Oxford Economic Papers*, 52(3):584–594.
- Koehne, S. (2018). On the taxation of durable goods. *International Economic Review*, 59(2):825–857.
- Koehne, S. and Sachs, D. (2022). Pareto-improving reforms of tax deductions. *European Economic Review*, 148:104214.
- Krusell, P., Quadrini, V., and Rios-Rull, J.-V. (1996). Are consumption taxes really better than income taxes? *Journal of Monetary Economics*, 37(3):475–503.
- Lilly, M. B., Laporte, A., and Coyte, P. C. (2007). Labor market work and home care’s unpaid caregivers: a systematic review of labor force participation rates, predictors of labor market withdrawal, and hours of work. *Milbank Quarterly*, 85(4):641–690.
- Lockwood, B., Allcott, H., Taubinsky, D., and Sial, A. Y. (2021). What drives demand for state-run lotteries? evidence and welfare implications. Mimeo.
- Løken, K. V., Lundberg, S., and Riise, J. (2017). Lifting the burden formal care of the elderly and labor supply of adult children. *Journal of Human Resources*, 52(1):247–271.
- Mankiw, N. G., Weinzierl, M., and Yagan, D. (2009). Optimal taxation in theory and practice. *Journal of Economic Perspectives*, 23(4):147–74.
- Millar-Powell, B., Brys, B., O’Reilly, P., Rehm, Y., and Thomas, A. (2022). Measuring effective taxation of housing: Building the foundations for policy reform. OECD Taxation Working Papers No. 56.
- Mirrlees, J., Adam, S., Besley, T., Blundell, R., Bond, S., Chote, R., Gammie, M., Johnson, P., Myles, G., and Poterba, J. M. (2011). *Tax by Design: The Mirrlees Review*. Oxford University Press.
- Mirrlees, J. A. (1971). An Exploration in the Theory of Optimum Income Taxation. *Review of Economic Studies*, 38(2):175–208.
- Naito, H. (1999). Re-examination of uniform commodity taxes under a non-linear income tax system and its implication for production efficiency. *Journal of Public Economics*, 71(2):165–188.
- Nakajima, M. (2020). Capital income taxation with housing. *Journal of Economic Dynamics and Control*, 115:103883.
- Oates, W. E. (1991). Pollution Charges as a Source of Public Revenues. In Giersch, H., editor, *Economic Progress and Environmental Concerns*, pages 135–152. Springer Berlin Heidelberg.
- OECD (2020). Consumption tax trends 2020: Vat/gst and excise rates, trends and policy issues.
- OECD (2022). Oecd revenue statistics. <https://stats.oecd.org>.
- Olovsson, C. (2015). Optimal taxation with home production. *Journal of Monetary Economics*, 70:39–50.

- Parodi, F. (2021). Taxation of consumption and labor income: a quantitative approach. Mimeo.
- Pearce, D. (1991). The Role of Carbon Taxes in Adjusting to Global Warming. *Economic Journal*, 101(407):938.
- Persson, M. (1995). Why Are Taxes So High in Egalitarian Societies? *Scandinavian Journal of Economics*, 97(4):569.
- Pigou, A. C. (1920). *The Economics of Welfare*. Macmillan, London.
- Pirttilä, J. and Tuomala, M. (1997). Income tax, commodity tax and environmental policy. *International Tax and Public Finance*, 4(3):379–393.
- Ramsey, F. P. (1927). A Contribution to the Theory of Taxation. *Economic Journal*, 37(145):47.
- Richter, W. F. and Boadway, R. W. (2005). Trading Off Tax Distortion and Tax Evasion. *Journal of Public Economic Theory*, 7(3):361–381.
- Ring, R. J. (1999). Consumers' Share and Producers' Share of the General Sales Tax. *National Tax Journal*, 52(1):79–90.
- Rossi-Hansberg, E. and Sarte, P.-D. (2012). Economics of housing externalities. *International Encyclopedia of Housing and Home*, 2:47–50.
- Saez, E. (2002). The desirability of commodity taxation under non-linear income taxation and heterogeneous tastes. *Journal of Public Economics*, 83(2):217–230.
- Salpukas, A. (1992). Falling tax would lift all yachts. New York Times, <https://www.nytimes.com/1992/02/07/business/falling-tax-would-lift-all-yachts.html>.
- Sandmo, A. (1975). Optimal Taxation in the Presence of Externalities. *Swedish Journal of Economics*, 77(1):86–98.
- Selin, H. and Simula, L. (2020). Income shifting as income creation? *Journal of Public Economics*, 182:104081.
- Spiritus, K. (2022). Optimal commodity taxation when households earn multiple incomes. *Working Paper, Erasmus University Rotterdam*.
- Stantcheva, S. (2017). Optimal taxation and human capital policies over the life cycle. *Journal of Political Economy*, 125(6):1931–1990.
- UNU-WIDER (2021). Government revenue dataset, version 2022. United Nations University, World Institute for Development Economics Research.
- Zodrow, G. R. (1995). Taxation, uncertainty and the choice of a consumption tax base. *Journal of Public Economics*, 58(2):257–265.