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Tax Expenditures and Sustainability. An Overview

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ABSTRACT

Fiscal policy has significant effects on a broad sustainability agenda covering long-term economic, social and environmental goals. However, whereas a myriad of actors scrutinize taxation as well as direct government spending with regard to their impact on sustainability, a key feature of fiscal policy has only partially hit the radar screens in the sustainability debate: Tax Expenditures.

Tax expenditures (TEs) are benefits granted through preferential tax treatment that lower government revenue from the beneficiary taxpayer. Research on the links between these schemes and sustainability is scarce, and mostly focused on a single TE or a group of TEs pursuing the same policy goals, the effects of TEs on a single dimension of sustainability, as well as on a specific country, region or trade bloc.

Against this background, the goal of this discussion note is threefold: i) to introduce the reader to the concept and overall significance of TEs; ii) to outline an analytical framework to evaluate the impact of a selected group of TEs on sustainability and; iii) to provide an overview on specific TEs, including TEs in both developing and developed economies, and to assess their alignment with a broad sustainability agenda, as well as their effectiveness and efficiency.

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1 INTRODUCTION

Fiscal policy has considerable impacts on a broad sustainability agenda covering long-term economic, social and environmental objectives. Many strands of literature study the effects of taxation and government expenditure on the behavior of economic agents with a particular focus on sustainability. Research on the use of marked-based instruments such as carbon taxes to foster the transition to a green economy is a case in point.[1] Tax incidence literature is another example as "the ability to shift the final tax burden onto other taxpayers will affect the distributional impact […] of a tax reform."[2], and thus has significant repercussions for social sustainability.[3] Similarly, the pass through of corporate income taxes (CITs) to wages has notable social implications – in particular for job creation (Prillaman and Meier, 2014) as well as wages (Arulampalam et al., 2012).

However, whereas a myriad of actors scrutinize taxation as well as direct government spending with regard to their impact on sustainability, a key feature of fiscal policy has only partially hit the radar screens in the sustainability debate: Tax Expenditures.

Tax expenditures (TEs) are benefits granted through preferential tax treatment that lower government revenue from the beneficiary taxpayer. Research on the links between these schemes and sustainability is scarce, and mostly focused on a single TE or a group of TEs pursuing the same policy goals, the effects of TEs on a single dimension of sustainability, as well as on a specific country, region or trade bloc.

Against this background, the goal of this discussion note (hereafter the note) is threefold: i) to introduce the reader to the concept and overall significance of TEs; ii) to outline an analytical framework to evaluate the impact of a selected group of TEs on sustainability and; iii) to provide an overview on specific TEs, including TEs in both developing and developed economies, and to assess their alignment with a broad sustainability agenda, as well as their effectiveness and efficiency.

Obviously, a solid analysis of TEs' impacts would require a longer report on each of them. The following study is thus to be seen as a starting point and possible framework for further research.

The remainder of this note is structured as follows. In the next section we provide a brief overview of TEs. Moreover, we discuss the main conceptual and methodological issues regarding the definition and quantification of these schemes. Section 3 explores whether the stated goal of a select group of TEs is aligned with a broad sustainability agenda. In

[1] See, for instance, Marron and Toder (2014) and Goulder and Schein (2013).
[2] Brys et al. (2016), p. 44.
[3] For a detailed review of tax incidence literature, see Fullerton and Metcalf (2002).

addition, it provides an overview on the significant amounts of government revenue forgone through these instruments and assesses their effectiveness and efficiency in reaching their stated goals. Section 4 concludes.

2 Tax Expenditures

TEs are benefits granted through preferential tax treatment that lower government revenue from the beneficiary taxpayer. They are substantial and used widely as public policy instruments by governments across the world. In 2014, the US federal government is estimated to have foregone 1.2 trillion USD through 169 TEs.[4] In Australia, the largest 25 reported TEs added up to more than 131 billion AUD (99.8 USD) in 2015.[5] In the UK, TEs amount to the equivalent of 46% of the central government total tax and non-tax revenue. In Canada, that figure is up at 64%.[6] TEs in Jordan were estimated to be at least 1.6 billion Jordanian Dinar (2.3 billion USD) in 2012, which represented 7% of gross domestic product (GDP) and almost half of total tax revenue collection during the same year.[7] In 2012, TEs in Peru accounted for nearly 2% of GDP. Close to 19% of the country's TEs are granted to the agricultural sector, nearly 12% go to education, over 11% to the financial sector, and just below 4% are provided to encourage investments in Amazonia.[8]

TEs take different shapes and forms including exemptions, deductions, credits, rate reliefs or deferrals, and can target a specific group of taxpayers as well as specific activities or regions. They cover the entire fiscal system and, hence, are channeled through CIT and personal income tax (PIT) as well as through consumption taxes such as value added tax (VAT). The relative importance of each channel varies from country to country. Often, TEs channeled through PIT (in % of GDP) exceed those granted through CIT. In contrast, in some countries such as Denmark and the Netherlands, TEs channeled through CIT exceed those granted through PIT. Several countries such as France, Poland, the UK and many Latin American economies (all but Brazil, Chile, Ecuador, Guatemala and Mexico), grant the bulk of TEs through VAT.[9]

Proponents argue that TEs promote a broad array of economic, social and environmental policy goals including job creation, innovation, education, as well as reducing inequality. They also contend that these tax benefits internalize negative and positive external effects and are therefore a key instrument to correct for market failures. Some make the case that

[4] US Government Accountability Office (2016).
[5] See Australian Treasury (2016). As it will be discussed in detail in Section 2.3, aggregate revenue forgone estimates should be interpreted with caution because behavioral changes are not taken into account by this method. Nonetheless, adding these figures provides a better idea of the magnitude of these schemes.
[6] Myles et al. (2014), p. 11.
[7] USAID (2013).
[8] Matus-López et al. (2016).
[9] See OECD (2010), Astarita et al. (2014), European Commission (2014b) and Pecho Trigueros (2014).

TEs can benefit from lower administrative costs compared to spending programs where ministries would need to allocate resources to running programs in either cash or kind.[10]

TE critics, on the other hand, question the effectiveness and efficiency of these instruments in reaching their stated objectives. They also argue that TEs reduce public resources that are needed to reach other policy goals.[11] Moreover, they point to the undesirable distributional and environmental side-effects that many TEs create, as well as to the lack of transparency they bring along.

Indeed, unlike direct spending that is regularly subject to strict controls and for which annual detailed reporting is usually publicly available, TEs are under-scrutinized. Countries report on TEs based on very different and heterogeneous standards both with respect to the quality and scope of the data they provide. As a result, these instruments are hardly ever subject to sound cost-benefit analyses and quantifying and evaluating them can be a Herculean task.

The European Commission, for instance, requires Member States to publish detailed information on the effect of TEs on revenue. Nevertheless, the Directive does not specify a standardized procedure for evaluating TEs. Hence, "…19 Member States now regularly report on tax expenditures, two more than in 2013. Reporting practices do, however, vary widely across countries, and the reports produced therefore also vary, in terms of their presentation, depth and coverage."[12] In France, the budget appendix dedicated to TEs explicitly acknowledges that 237 TEs out of 470 cannot be quantified, or only a rough order of magnitude can be given.[13] Australia is another case in point. The country is often highlighted as one of the more advanced ones in terms of TE reporting but, nonetheless, estimates for 48% of all TEs (140/290) were not available in the country's Tax Expenditures Statement 2015.[14]

2.1 DEFINITION

The notion of TEs was introduced by Stanley Surrey, a former Harvard professor and Assistant Secretary of the US Treasury, who highlighted the fact that government support for specific groups or activities is often granted through tax privileges rather than direct spending. Surrey directed the Treasury in the late 1960s to assess the magnitude and scope of such TEs[15], and in 1973 made the case for cuts to them in his book titled "Pathways to Tax Reform".[16] A year later, the US Budget Reform Act provided a formal definition of TEs

[10] See e.g. Tyson (2014).
[11] Di Bella et al. (2015).
[12] European Commission (2015), p. 55.
[13] Bauger (2014).
[14] See, also, Burton and Stewart (2011).
[15] Burman (2013).
[16] Surrey (1973).

as “those revenue losses attributable to provisions of the Federal tax laws which allow a special exclusion, exemption, or deduction from gross income or which provide a special credit, a preferential rate of tax, or a deferral of tax liability…”.[17]

As straightforward as this definition may sound, the debate on what should be considered a TE and what not – and what should thus be counted when measuring their magnitude – continues until today.

In that context, two main approaches are usually proposed to define the TE concept. Some experts have taken what is referred to as a “direct” approach to define TEs based on a set of characteristics. Two illustrations are listed below.

- "A tax expenditure is a provision in tax rules, motivated by a social or economic policy, which reduces or defers the tax liability of a taxable entity in order to help a particular group of taxpayers or to encourage a particular activity and could be replaced by a system of direct expenditures for this purpose.” (Myles et al., 2014)
- "A tax expenditure [is] a tax provision significantly motivated by a policy objective other than to raise revenue that: reduces revenue by lowering tax for a limited or select group of taxable entities; is able to be replaced by a direct expenditure programme; and is neither administrative in nature or motivated by a domestic double taxation objective." (Fookes, 2009)

Both definitions have several points in common, e.g. both refer to revenue forgone, to targeted policies as well as to the possibility of replacing TEs by direct expenditure. At the same time, they present differences that may seem subtle but can have crucial implications when estimating and comparing TEs across countries. Whereas the definition given by Myles et al. (2014) includes tax deferrals, the one by Fookes (2009) does not. This difference is also observed across country reporting on TEs. Tax deferrals are listed as TEs for example in Canada, Sweden, and the United States. In contrast, the Argentinian government uses a TE definition that only includes items which create a permanent revenue loss. In that context, and disregarding the loss in the net present value of revenue that are deferred, Argentina does not consider tax deferrals as TEs.[18]

A different “indirect” approach is taken with definitions that identify TEs as departures from the normal tax structure. They define TEs as deviations from a – usually country-specific – benchmark. Surrey and McDaniel (1976) provide a case in point. They highlight that taxation consists of two components: i) the general provisions of the tax system, and ii) exemptions from those provisions in favor of a particular industry, activity, or group. It is the latter that they refer to as TEs.

[17] Surrey and McDaniel (1979), p. 231.
[18] MECON (2012).

Defining TEs as departures from a country-specific benchmark provides a solid starting point for national TE reporting. Differences in national tax structures and thus in benchmarks, however, will lead to certain tax provisions being considered as TEs in one country, and not in another, thus again posing a significant challenge for international comparability.

Against this background, some studies aim at defining a standard benchmark for each TE across different countries. Oosterhuis et al. (2014) is an example. The authors identify and quantify TEs on fossil fuels in all 28 European Union (EU) Member States. Whereas for TEs related to VAT, CIT and PIT they apply country-specific benchmarks, they use the draft rates in the Commission's 2011 proposal for amending the Energy Taxation Directive (COM (2011) 169) as a harmonized benchmark across all Member States for energy taxes. Obviously, such an approach does not come without caveats either. Applying the proposed energy tax rate as a standard benchmark across the EU members blends out different political preferences between countries. The strong opposition by both the European Parliament and the European Council to the Commission's proposal for a new EU Energy Tax Directive highlighted how significant these differences can be. The Commission withdrew its proposal in 2015.

Reaching consensus on a homogeneous benchmark among countries is already a daunting task if only focused on the EU. Applying a similar approach globally would certainly increase its difficulty.

2.2 CLASSIFICATION

TEs can be classified according to different criteria, including the mechanism through which they are provided (e.g. exemptions, allowances, credits, rate reliefs, deferrals), the type of tax that they relate to (e.g. PIT, CIT, VAT), or the policy objective (e.g. fostering employment, expanding home ownership, strengthening energy security).[19] Classification into subgroups is useful both for reporting and evaluation. The best way to classify TEs is highly dependent on the objective of the analysis.

Table II.1 presents a brief description of different categories for TE classification.

[19] See Myles et al. (2014) for a longer list of different options for classification.

Table II.1: Classification of Tax Expenditures

Category	Criterium	Examples
Mechanism for delivery	The mechanism through which the TE is granted	Exemption, deduction, credit, relief, tax-free threshold, deferral
Type of tax	The particular tax base to which the TE is applied	PIT, CIT, VAT
Budget category	The budgetary heading to which the TE is attributable	By function such as education, health, fuel and energy
Policy objective	The specific policy objective for which the TE was designed	Making Work Pay, housing, innovation
Beneficiary	The agent or entity that benefits from the TE	A (group of) consumer(s), producer(s), region(s)
Size	The magnitude of the TE in terms of its cost (e.g. revenue forgone)	Absolute terms (e.g. in dollars), % of GDP, % of total tax revenue

2.3 MEASUREMENT

A solid quantification of TEs is key to evaluate their effects. Similar to the open debate about their definition, estimating the cost of TEs offers different possible approaches, with no method being an uncontested best option.

The three main methodologies to measure TEs are the following ones:

- *Revenue foregone approach*: estimates the amount by which taxpayers have their tax liabilities reduced as a result of a TE based on their actual current economic behavior.
- *Revenue gain approach*: estimates the additional revenue that would be collected if a TE was removed, and accounting for behavioral changes resulting from this removal.
- *Outlay equivalent approach*: estimates the government cash outlay required for an alternative direct spending program replacing the TE that would have the same benefit for the taxpayers. As the revenue forgone method, it assumes no behavioral change.

Each of these approaches has its pros and cons. And each of them will provide different estimates of the size of a TE. On the one hand, direct spending and tax benefits are alternate mechanisms to achieve a given goal. Hence, the preferred method to evaluate policy alternatives would be the outlay equivalent approach, because it allows for a

comparison between TEs and direct spending.[20] On the other hand, in practice, it might be impossible to design an outlay program that gives the taxpayer exactly the same benefit as the correspondent TE provides to her.[21]

Between the revenue foregone and gain approaches, the latter offers a more accurate estimate as it takes behavioral changes into account. Indeed, the fact of not internalizing behavioral changes is one of the most significant weaknesses of the revenue foregone method. Taxpayers are likely to respond to the removal of a TE by changing their economic behavior. To accurately estimate the fiscal effect of removing or introducing a TE, a reflection of these changes is critical.

Nevertheless, and probably because of its relative simplicity, most countries report on TEs based on the revenue forgone approach.[22] Some of them do provide figures based on the other two methods but only as a complement to the measurement based on revenue foregone. For example, from the Fiscal Year 1984 Budget until 2008, the US Treasury presented outlay equivalent estimates on top of their standard revenue foregone-based figures. Similarly, in Chapter 3 of its yearly Tax Expenditures Statement, the Australian Treasury provides estimates of a select group of TEs based on the revenue gain approach, in addition to the standard estimates based on the revenue forgone method.[23]

Finally, one should be careful when it comes to the interpretation of TE figures. In spite of their significant impact, the potential interconnections between the different schemes are often not taken into account when computing the cost of TEs. Adding up all the individual costs computed separately and without taking behavioral changes into account would not result in a figure that represents the total cost of all TEs. In this context, the Australian Treasury highlights that "it is not appropriate to aggregate revenue forgone estimates. As indicated above, revenue forgone estimates do not take account of potential changes in taxpayer behavior following the (hypothetical) removal of a tax expenditure. However, in reality such changes in behavior would be likely to occur – in particular, the removal of one tax expenditure would often affect the utilization of other tax expenditures. Aggregating revenue forgone estimates therefore risks significantly amplifying the limitations inherent in this method of estimating the size of tax expenditures."[24] Others in contrast, add up the TEs granted through the different tax bases in order to provide the order of magnitude of those schemes.[25] This is also the approach we follow in this note.[26]

[20] Davidson (2012).
[21] Myles et al. (2014).
[22] OECD (2010).
[23] Australian Treasury (2016).
[24] Australian Treasury (2016), p. 6.
[25] See, for instance, Astarita et al. (2014), Myles et al. (2014) and Tyson (2014).
[26] In doing so, we also follow the notion that negative TEs are equivalent to tax revenues that already appear in the regular fiscal accounts and should thus not be included in TE reporting.

Box II.1 Moving to Data. The Estimation of Tax Expenditures in Practice.

Most countries report on TEs based on the revenue forgone method. Whereas for consumption taxes the computation is relatively straightforward, the quantification of TEs through direct taxes requires the use of microsimulation techniques.

The estimates for TEs channeled through consumption taxes are based on national accounts data and/or household expenditure data. They are computed by multiplying the pre-tax consumption value of a tax-preferred item with the size of the rate reduction, i.e. the difference between the standard and the reduced tax rate.

This simple approach is not applicable to direct taxes because, unlike indirect tax rates, direct tax rates differ across individuals and often also across companies.[27] Hence, TEs channeled through PIT or CIT, are quantified based on micro-simulation models with data from a representative sample of taxpayers. Most of these models use three steps to produce their estimates. First, a baseline specification is defined by applying the actual tax law to the data for each of the sampled taxpayers to calculate their tax liabilities. Second, the impact of removing one or several TEs is computed by running the model without the TE(s) and comparing the results to the benchmark. Finally, because the sample of individuals and households is a representative one, the results are scaled-up in order to obtain the aggregate revenue implications of the TEs, and to examine the distributional effects on different sub-groups of the population.

These models are static in the sense that the arithmetic simulation of taxes and benefits does not take the behavioral changes of individuals into account. Hence, they can only estimate the revenue foregone of a given TE, but not the revenue that would be gained from phasing out that scheme.[28]

Most countries have their own microsimulation model. In the UK, the Institute for Fiscal Studies (IFS) uses TAXBEN, a tax and benefit model to analyze the impact of tax changes on government revenues and income distribution.[29] Similarly, in the US, the National Bureau of Economic Research (NBER) works with TAXSIM, which uses input data directly provided by the Internal Revenue Service.[30]

Another particularly interesting microsimulation model is EUROMOD, the EU tax-benefit model that simulates individual and household tax liabilities and benefit entitlements according to the policy rules in place in each EU Member State.[31] Besides the fact of being

[27] Myles et al. (2014).
[28] Sutherland and Figari (2013).
[29] Giles and McCrae (1995).
[30] Feenberg and Coutts (1993).
[31] Sutherland and Figari (2013).

openly accessible, the main advantage of this model is its scope. It covers the policy systems of all European countries within the same framework allowing for a certain level of cross-country comparability. This comparability is possible because EUROMOD is more flexible than standard microsimulation models that only reflect the current law in a particular country. This flexibility "…is essential if consistency (of results across countries), transferability (of tax-benefit system components) and use by multiple users are to be achieved."[32]

3 Tax Expenditures and Sustainability

The economic turmoil that started in 2008 has put governments across the world under increasing pressure to reduce their fiscal deficits. As has frequently been the case in similar situations, policy recommendations for tax reform point towards packages that, at the same time, reduce tax rates and broaden the tax base.

The consensus regarding the mix of policies that these reforms should include has moved to a more inclusive approach focusing not only on debt reduction and efficiency gains but also on fairness and equity as well as on the environment and climate change.[33] The 2014 International Monetary Fund (IMF) policy paper "Fiscal Policy and Income Inequality" and the 2015 book "Inequality and Fiscal Policy" are cases in point. The latter states that "…growth and equity are not necessarily at odds; with the appropriate mix of policy instruments and careful policy design, countries can in many cases achieve better distributional outcomes and improve economic efficiency". Another example is the recent OECD paper "Tax Design for Inclusive Economic Growth" that discusses how "growth-enhancing tax reforms might come at certain costs in terms of meeting equity goals [and that] tax design for inclusive growth requires taking into account the distributional implications of tax policies."[34]

TEs play a crucial role in this context. Leaving in place only those schemes that have been scrutinized through a sound cost-benefit analysis – by assessing not only their stated primary goals but also the second-order effects that these schemes may have – would reduce the pressure on fiscal policy space and, at the same time, increase the efficiency and equity of tax systems. As highlighted by Brys et al. (2016), "tax measures that lead to a narrower distribution of disposable income include among others a progressive personal income tax (PIT); base broadening by removing or scaling back tax expenditures which benefit high income recipients disproportionately (such as deductions for private pension savings and preferential tax treatment of immovable property) and by taxing all forms of

[32] Sutherland and Figari (2013), p.5.
[33] See, for instance, Saad-Filho (2010) and IMF (2014).
[34] Brys et al. (2016), p. 5.

remuneration including fringe benefits, carried interest and stock options as ordinary income; turning tax allowances into tax credits as the value of tax allowances increases with marginal tax rates while the value of refundable tax credits is equal for all taxpayers […]".[35]

Against this background, one would have expected to see a reduction of TEs gaining momentum. Strikingly though, in the recent past, several countries have moved in the opposite direction. The UK, for example, has introduced a welfare reform that cut its social spending while roughly doubling the amount of income exempt from PIT.[36] Likewise, since the new government took over in December 2015, Argentina introduced several tax incentives (and other measures) benefiting small and medium sized enterprises (SMEs) as well as a significant VAT rebate for retirees and lower income households. Similarly, a recent report highlights the wide use of TEs in Eastern Africa where Kenya, Rwanda, Tanzania and Uganda are estimated to lose up to 2.8 billion USD in government revenues from tax incentives and exemptions.[37]

This being said, many TEs may make sense as a policy instrument. Indeed, as highlighted above, TEs are often designed and implemented to pursue a broad array of economic, social and environmental policy goals that include creating more and better jobs, boosting innovation, improving education as well as reducing inequality. While these policy objectives appear aligned with a sustainability agenda, other TEs may pursue more debatable targets. Moreover, all TEs should pass the crucial test whether they are indeed the best policy instrument to achieve their stated goals, both in terms of effectiveness and efficiency.

Evaluating the effectiveness and efficiency of TEs is no simple task. The technical difficulties discussed throughout Section 2 illustrate why measuring TEs is particularly challenging. In addition, as is the case for most economic policies, the effectiveness of these schemes depends on their concrete design, the economic environment in which they are enacted, as well as their interaction with other policies. Wicks-Lim and Pollin (2012) show that, in the US, the benefits of the minimum wage and those of the Earned Income Tax Credit (EITC)[38] compound each other and, hence, estimating their costs or assessing their effectiveness separately may lead to spurious results. The French "Zones Franches Urbaines"[39] program is another case in point. Briant et al. (2015) empirically show that geographical characteristics (i.e. spatial isolation) of the neighborhoods where the program is implemented are crucial to explain the effectiveness of the scheme. The authors conclude that the impact of the

[35] Brys et al. (2016), p.11.
[36] Butler (2016).
[37] ActionAid/Tax Justice Network Africa (2016).
[38] The EITC is a tax credit for working people in the US with moderate or low incomes. See IRS (2016a) and chapter 3.7.
[39] The "Zones Franches Urbaines" are urban zones considered as vulnerable, in particular due to high unemployment, that offer tax incentives to foster economic activity. See Duhamel (2014).

different tax breaks granted through the program on job creation and firm settlement rates is highly dependent on isolation.

The time dimension is also crucial to evaluate the impact of TEs. Chirinko and Wilson (2016) find that whereas the cumulative impact of the job creation tax credits (JCTCs) enacted by US states between 1990 and 2007 is positive, the full effect is realized only several years after their implementation. One could argue that this is a common feature to all economic policies. Nonetheless, the time dimension is a particularly relevant issue in the case of TEs. The lack of transparency as well as the heterogeneity in the quality of the reporting on TEs significantly jeopardizes comparability across jurisdictions, but also in time. In other words, on top of the lack of comparability of TEs between countries discussed before, within country comparisons could also be misleading because the "estimates may change between editions as benchmarks are modified, tax expenditures are modified, revised or new data becomes available, or changes in modelling methodology are made".[40]

Within this context, and despite all the methodological caveats and data constraints discussed above, we believe that a comprehensive evaluation of the impact of TEs on sustainability is crucial and should be based on the following three questions:

- **Goal Alignment:** Are the stated goal(s) of a tax expenditure aligned with a broad sustainability agenda that strengthens individual opportunity, social cohesion and environmental stability?
- **Effectiveness:** Is a tax expenditure effective in reaching the goal(s) it was designed for?
- **Efficiency:** Are there externalities arising as a consequence of the implementation of this tax expenditure that would hinder its efficiency? Is the tax expenditure the most efficient instrument to reach the policy goal? In particular, are there alternatives through direct spending that would increase impact?

The first question discusses whether the stated goal(s) of each of the selected TEs is (are) aligned with the sustainability objectives described above.

The rationale behind the second question is straightforward. It tackles the direct effect(s) of a particular TE on the objective(s) it was designed for.

The efficiency question focuses on two aspects that are crucial when it comes to policy evaluation. First, it assesses whether the implementation of a particular TE triggers effects that may have an impact on other policy goals. For instance, there is strong consensus on the significant negative impact that the tax benefits granted to fossil fuel producers (and consumers) have on the environment[41] and, thus, on the urgent need of a significant reduction in their use.[42] In other cases the side effects may not be as evident, but

[40] Australian Treasury (2016), p. 5.
[41] Oosterhuis et al. (2014) and OECD (2015b).
[42] The "Joint report by IEA, OPEC, OECD and World Bank on fossil-fuel and other energy subsidies: An update of the G20 Pittsburgh and Toronto Commitments" is a case in point (https://www.oecd.org/env/49090716.pdf).

nonetheless critical. The regressive nature of mortgage interest deduction (MID) or tax exemptions in the context of retirement schemes are cases in point.

Second, it highlights the need to evaluate the efficiency of a TE in comparison to direct spending.[43] Under certain conditions, TEs compared to payments from the government can have several advantages such as low administrative costs, low stigma for the beneficiaries and or increased political acceptability. At the same time, TEs often lead to an underestimation of their costs as well as an overestimation of their benefits. Burman and Phaup (2012) argue that with TEs "…taxpayers get benefits along with the illusion that they are costless. Tax expenditures make government appear smaller while providing more benefits. This creates the illusion of extreme policy efficiency when, in fact, tax expenditures are often less efficient than alternative cash programs".[44]

The following chapters apply this framework to seven types of TEs that are classified according to the policy goals they pursue or their budget category. They provide a sense for the design of different TEs as well as their magnitude. They also offer insights on key issues in relation to their goal alignment, effectiveness and efficiency. At the same time, they reflect the fact that a solid evaluation of TEs is beyond the scope of this note, and thus stop short of making judgements.

3.1 CONSUMPTION TAX EXPENDITURES

TEs through consumption taxes are widely implemented worldwide. The main TEs related to consumption are those channeled through VAT. The standard VAT rate is usually applied as a straightforward benchmark in this context. Hence, reduced rates and exemptions are generally considered exceptions to the rule and, thus, as TEs. Nevertheless, in some countries, some VAT exemptions are considered part of the normal tax structure and are thus not identified as TEs. In Sweden, for instance, this is the case for VAT exemptions on letting property as well as on financial and insurance services.[45]

The implementation of TEs for consumption varies from case to case. In the US, most states exempt groceries from sales tax, some states tax groceries at a reduced rate, and others implement the standard sales tax.[46] New York State, as an example for the level of detail that such provisions go into, offers sales tax exemption for "food, food products, beverages, dietary foods, and health supplements sold for human consumption. The exemption does not include candy and confectionery, fruit drinks which contain less than 70 percent of natural fruit juice, soft drinks, sodas, beer, wine, or other alcoholic beverages. In addition,

[43] See, for example, Paqué (1984).
[44] Burman and Phaup (2012), p. 105.
[45] Gebauer et al. (2010).
[46] Drenkard and Walczak (2015).

sales of food (other than sandwiches) or drink of a type commonly sold in food stores (other than food stores principally engaged in selling prepared foods) are exempt when sold by a restaurant or other establishment in an unheated state, for off-premises consumption."[47] Member states of the EU apply VAT exemptions as well as reduced and zero VAT rates to goods and services ranging from foodstuffs, water supplies and pharmaceutical products to Pay TV, hotel accommodation and admission to sporting events.[48] The Argentinian government has recently announced a 100% VAT refund for items included in a basic-goods basket for retirees as well as lower-income households so they are able to face the inflationary pressure that the economy has been going through.[49] Many African countries are reported to have VAT systems that implement so many exemptions and zero rates on domestic goods that some commentators have likened them to "Swiss cheeses" and highlighted that the standard rate is mainly applied to luxury goods.

In the EU, VAT TEs are as high as 2-3% of GDP in Italy, Poland, Spain and the UK.[50] Sales tax expenditures on food items in New York State amount to close to 2 billion USD.[51] In Jordan, the second largest TE (behind the personal and family allowance for PIT) is due to a zero rate applied to the domestic sales tax for several goods including food preparations for infant or handicapped use, inputs of drug manufacturing, books and similar printed materials, as well as petroleum oils and oils obtained from bituminous minerals. In 2011, this single TE accounted for 263 million JD (378 million USD) or 1.2% of GDP.[52]

While the quantification of consumption TEs is relatively straightforward, it nonetheless present a few methodological issues. In particular, as discussed by Oosterhuis et al. (2014), the interaction between different taxes may play a significant role when estimating the real cost of VAT TEs. For instance, reduced excise tax rates also lead to reduced VAT revenues, because VAT is computed on the price including excise taxes. Furthermore, VAT is an ad valorem tax. Hence, the size of VAT TEs is highly dependent on the price of the good or service. For example, a decrease of raw material prices is likely to trigger a reduction in the estimated size of VAT TEs for these goods. Nevertheless, this would be reflecting a mechanical effect rather than a real reduction of the governments' support through such a scheme.[53]

[47] New York State (2016), p. 95.
[48] European Commission (2016b).
[49] Viar (2016).
[50] Astarita et al. (2014).
[51] New York State (2016), p. 87.
[52] As discussed by USAID (2013), this figure may be considered as a lower bound due to data constraints. TEs from reduced tax rates on sales (4% and 8% compared to the 16% standard rate) could not be quantified, since tax returns do not differentiate between standard rate sales and reduced rate sales.
[53] Oosterhuis et al. (2014).

Goal Alignment

Two main arguments are usually raised to support consumption TEs. First, VAT is widely seen as a regressive tax because the marginal propensity to consume is higher for lower income households. Reduced VAT rates for necessity goods (mainly food but also e.g. transportation services) aim at tackling this issue, at increasing their affordability and thus at protecting the poor.

Second, reduced VAT rates are applied to goods and services that have positive externalities and which would thus be under-consumed without government support. Examples include VAT exemptions for education and cultural goods.[54]

While both goals appear in line with a sustainability agenda, they can only be judged in the context of concrete tax designs. In particular, goal alignment needs to be based on a thorough review of the goods and services that are covered by consumption TEs. Such a review also needs to be conscious of the significant lobbying taking place in this context. An analysis of tax lobbying in Zambia is a case in point: According to Bwalya et al. (2011), VAT accounts for the largest number of proposals (26.3%) and, around 80% of these proposals call for a reduction in Zambia's VAT rates from the standard 17.5% rate to rates ranging from 10% to 15%.

Effectiveness

One of the key determinants for the effectiveness of consumption TEs is tax incidence, i.e. the question who ultimately pays the tax and who ultimately benefits from a tax exemption. If the reduced VAT rate on necessity goods is not passed through to consumers but rather leaked to producers through higher prices, the effectiveness of such a scheme in making those goods more affordable for lower-income households would be significantly hindered.

Empirical analyses of price changes in response to increases and reductions of consumption taxes provide an illustration. The authors of a recent study on the effects of VAT reductions in the Swedish and Finnish restaurant industry find that whereas independent restaurants left prices unchanged, a substantial fraction of restaurants belonging to chains chose a complete pass-through. The authors explain these results based on tax incidence and its interlinkage with the price-setting strategies of firms. Differences arise - they argue - because independent restaurants aim for well-defined, crude price ranges, whereas chains use more elaborated, coordinated pricing strategies.[55]

Benzarti and Carloni (2015) combine monthly commodity price data with information on VAT rates across several EU countries for the 1996-2015 period to assess the price response

[54] See Borselli et al. (2012).
[55] Harju et al. (2015).

to changes in consumption taxes. The authors find that prices rise after a VAT increase but do not decrease following a VAT reduction.

Kosonen (2015) is another case in point. The paper assesses the tax incidence of VAT in Finland using a tax reform targeted at labor-intensive services that created a natural experiment set-up. The reform introduced a reduced VAT rate of 8% for hairdressers whereas the standard tax rate of 22% was kept in place for beauty salons (the control group). The results show that Finnish hairdressers only reduced their prices by half of what a full shift would have implied. Moreover, the effects on demand and, hence, on labor demand were not significant.

Finally, Benzarti and Carloni (2016) assess the 2009 French VAT reform for the restaurant sector, of which the main objectives were: i) to decrease the price of meals consumed in sit-down restaurants, ii) to stimulate employment and investment in the industry, and iii) to equalize the VAT rate between sit-down meals and take-away meals. The authors find that the reform mostly benefited sit-down restaurant owners with consumers benefiting relatively little and employees capturing roughly 20% (29%) of the benefit 18 (30) months after the reform was implemented. Hence, they conclude that the reform was not effective given that its stated goal was to benefit consumers rather than restaurant owners.

Efficiency

One of the main side effects of consumption TEs is their impact on income redistribution. As these schemes usually offer reduced rates of consumption to all taxpayers and as high-income earners consume more in absolute terms, the absolute tax benefit for high-income households is higher than those for low-income ones.

Take, for instance, the 2009 reduction in the French VAT rate for restaurants discussed before. Even if the primary goals of the reform were achieved and, hence, the prices of meals consumed in sit-down restaurants indeed decreased, it would have raised distributional concerns. Restaurant consumption could have some impact on lower-income current expenses but, it is rather a luxury good. Hence, a significant decrease in sit-down prices would likely have benefited mid- and higher-income households relatively more than lower-income ones.

Similar arguments are often raised with regard to a whole range of other goods and services. As Cnossen (2015) highlights: "not taxing water and electricity would disproportionately benefit higher-expenditure groups [...] The same observation applies to the VAT benefit distribution if no (input) tax were levied on medicines and health services. The poor derive limited benefits from preferential VAT treatment, because most medical products are largely unaffordable or of a low priority to these groups and zero-rating would

not save these people the VAT if they can access medical services and medicines free through the public health system."[56]

The same arguments apply for temporary tax exemptions such as the sales tax holidays implemented in the US, i.e. "… temporary sales tax exemptions, usually applying to a small number of taxable items for a very limited period."[57] Indeed, some argue that these schemes could even worsen the distributional impact of the sales tax system because wealthier taxpayers have more flexibility to shift the timing of their purchases and, hence, to take advantage of such a temporary tax break.

Finally, consumption TEs sometimes create negative externalities on the environment. For example, some countries such as Belgium, Estonia, Ireland, Latvia and Switzerland allow for a share of the VAT charged when purchasing company cars (to be used privately by employees) to be deducted from their CIT liabilities. In Ireland, for example, a 20% VAT deductibility is granted if the car is used for at least 60% for business purposes, for a minimum of two years (European Commission, 2015). Such a scheme generates distortions (for instance, with respect to cars that are bought privately) and goes against policies aimed at cutting carbon dioxide (CO_2) emissions.

Box III.1 The European Union VAT System. Towards More or Less Harmonization?

Since the creation of the Single Market, fiscal policy has always been among the most controversial topics. Indeed, the distribution of the competencies regarding the setting of taxes between Member States and the Commission is still nowadays one of the hottest topics in the EU. The intense debate around corporate taxation that has pushed the Commission to re-launch its Common Consolidated Corporate Tax Base (CCCTB) project is a case in point.

This is also true for VAT – a tax that raises roughly 1 trillion EUR a year in the EU Member States, accounting for 7% of EU GDP. Unlike other taxes such as PIT or CIT, however, VAT has for many years already been the tax for which Members States adopted a certain degree of harmonization. In particular, they agreed to a minimum standard VAT rate of 15% (there is no maximum) that has to be applied across the EU to all non-exempted goods and services. They also jointly adopted the rule that EU countries have the option to apply reduced tax rates (no less than 5%) to a limited number of goods and services that must be listed in Annex III of the EC VAT Directive. Moreover, some countries are allowed to apply further reduced rates, including some lower than 5%, according to "standstill derogations" that cover deductions that Member States had in place on 1 January 1979, or in the case of Member States that joined after this date, on the date of their accession.

[56] Cnossen (2015), p. 14.
[57] ITEP (2015).

European Commission (2015) presents a two-step screening process to identify those Member States that would particularly benefit from broadening their VAT base and, thus, from phasing out reduced rates and exemptions. The study shows that countries such as Greece, Spain, Italy, Poland and the UK have both i) a VAT revenue ratio significantly below the EU average and ii) a very low ratio of the average household VAT rate to the standard rate, which suggest that the low VAT revenue ratio is explained by policy issues, and not (or not only) by poor compliance.

The debate around zero- and reduced-rate goods has been a very controversial one in the recent past. Some of these discussions have also gained considerable attention in the press. The debate on the "tampon tax" is a case in point – particularly in the UK, where a campaign against a 5% tax on all sanitary goods that reached high levels of popularity is considered as one of the triggers of the referendum on EU membership that was held earlier this year in the UK.[58]

Against the backdrop of a broad debate on VAT harmonization, the Commission has recently launched the Action Plan on VAT, which aims at reforming the VAT tax code in order to reduce the high vulnerability to fraud when it comes to cross-border trade, at reducing the complexity of the system (in particular for SMEs), as well as modernizing the scheme so that it is aligned with the new features of the economy such as the increasing volumes of e-commerce. The Action Plan, presented as a first step to a definitive single European VAT area would "…treat cross-border transactions in the same way as domestic transactions (i.e. cross-border trade will no longer be exempt from VAT)…" and, hence, tackle one of the main weaknesses of the scheme that is currently based on 28 different VAT procedures and, thus, discourages firms from expanding their businesses across borders.[59] At the same time, the Commission is explicitly calling for more flexibility to Member States on setting VAT rates "subject to safeguards to prevent excessive complexity and distortion of competition inside the Single Market". The Action Plan proposes two concrete strategies to pursue these goals:

1. Maintain the standard VAT rate of 15% while extending the possibility to grant reduced rates and regularly review the list of goods and services.

2. Adopt the principle that Member States are free to set the reduced rates policy they wish, as long as it does not generate tax distortions and/or unfair competition.

Both strategies clearly go in the direction of giving more power back to the Member States in the VAT rates setting process, a decision that seems to be based on a political rather than

[58] The Guardian (2016).
[59] European Commission (2016a), p. 9.

economic rationale.[60] In particular proposition number 2 could trigger a race to the bottom that would end up shrinking national VAT bases and, thus, significantly reducing VAT revenue collection.

3.2 ENERGY TAX EXPENDITURES

Energy-related TEs comprise targeted tax benefits for both the production and consumption of energy as well as energy efficiency measures. Their stated goals cover objectives such as economic development, national energy security, energy access for the poor, mobility, and the transition towards a low carbon economy.

Energy TEs are channeled through all types of taxes. TEs related to energy as reported for the US are a case in point. They cover a total of 25 items at the federal level – including accelerated corporate depreciation schemes for fossil fuels exploration, CIT credits for the production of electricity from renewable energy, and PIT credits for residential energy efficient property.[61] They also comprise a variety of TEs offered by individual states. The sales tax exemption for oil and gas equipment in Texas as well as the fuel tax exemption for certain off-highway uses in West Virginia are illustrations for that.[62] Further examples from Europe and Asia Pacific include exemptions from fossil fuel taxes for particular sectors such as agriculture, aviation and fisheries; deductions from the PIT base for travelling to work by car; as well as lower VAT rates on certain energy products – such as reduced VAT on domestic fuels in the UK.[63]

TEs related to fossil fuels are significant. The OECD provides quantitative estimates for fossil fuel TEs in its member countries as well as the BRIICS – i.e. Brazil, Russia, India, Indonesia, China and South Africa.[64] In 2014, TEs on fossil fuels amounted to at least 59.8 billion USD in these economies[65] – including e.g. 1.8 billion USD in suspended excise taxes on aviation fuels for domestic flights in China, close to a billion USD in fuel tax exemptions for agriculture in South Korea, 0.8 billion USD in qualified capital expenditure credits in the US state of Alaska, as well as 0.6 billion USD in energy tax relief for energy intensive processes in Germany.[66] Korteland and Faber (2013) estimate the revenue foregone due to

[60] The Commission has recognized that "…appraisal of a more decentralized system ultimately depends on political preferences. Therefore the implementation of such a system cannot be decided upon as a pure technical matter, but requires political discussion." See European Commission (2016a), p. 12.
[61] US Treasury (2015), p. 4.
[62] OECD (2016a).
[63] See e.g. Swiss Federal Customs Administration (2016), Harding (2014), and BBC (2016).
[64] See also OECD (2015b).
[65] Own calculations based on the OECD (2016a) and with exchange rates as of end-October 2016. Data for Iceland, Ireland and Japan are not available. Data for Indonesia are from 2008, the latest year available. The OECD database includes TEs that are energy specific, and thus does not capture tax incentives that energy related activities benefit from which are also available to non-energy sectors. The tax incentives for the issuance of debt in the United States are a case in point. See Sherlock and Stupak (2015), p. 3.
[66] OECD (2016a).

exemptions in the aviation sector in the EU to be 7.1 billion EUR for VAT on total airline revenues and between 20 and 32 billion EUR for fuel taxes per year.

TEs to promote renewable energy and energy efficiency are also sizable. In the US, the energy production and investment credits to support renewables were estimated at 2.6 billion USD for 2015. Tax credits for energy efficiency measures in residential property stood at 0.9 billion USD.[67] Canada offers an accelerated capital cost allowance for certain clean energy and energy conservation assets. China provides a 50% refund of VAT paid on wind energy. In the Philippines, renewable energy developers are exempt from income taxes during the first seven years of commercial operations, and benefit from a reduced tax rate of 10% instead of 30% thereafter. And South Africa does not tax corporate income from the disposal of certified emission reductions.[68]

Goal Alignment

The stated goals of energy related TEs vary significantly. Some aim at economic development. Others are targeted at objectives such as supporting energy access for the poor, raising national energy security, or mobility. More recently, TEs have also increasingly been introduced to foster the transition towards a low carbon economy.

Most of these objectives seem well aligned with a broad sustainability agenda. Others are more debatable. A case for the latter is the goal to increase mobility – in particular the mobility of workers. Many countries across the globe pursue this target by offering tax incentives for commuters. The exclusion of reimbursed employee parking expenses from taxable personal income in the US, resulting in foregone revenue of 2.8 billion USD in 2015, is a case in point.[69] The deductibility of commuting costs from taxable personal income in Germany, with an estimated price tag of 4 billion EUR in 2014[70], is another illustration. Whether indeed the government should support commuting through tax privileges at the same time as there is growing concern about urban sprawl, congestion and energy demand, is controversial.[71]

Effectiveness

To what extent energy-related TEs are effective in reaching these goals provides further scope for debate.

The question whether tax incentives for energy use are indeed an effective approach to promote economic development is a case in point. While energy is obviously critical for economic expansion, reliance on discounted energy may put countries on an unsustainable

[67] Treasury (2015).
[68] KPMG (2015).
[69] Treasury (2015), p. 22.
[70] Laaser and Rosenschon (2015), p. 16.
[71] A different approach to support mobility is pursued by the Government of Canada which offers a "Moving Expense Deduction" from taxable income for which taxpayers are eligible, if their new home is at least 40 kilometers closer to the place of employment or study. See Government of Canada (2016), p. 177.

path – both in terms of economic competitiveness when energy prices rise, as well as in view of increasing externalities associated with energy use. It also reduces government revenues and thus restricts policy space to support other key factors in driving economic development. The critical government role for infrastructure, health and education is an example for that.[72]

Moreover, providing energy intensive sectors with exemptions from energy taxes may be effective in safeguarding a country's industrial base. It may also be underpinned by the argument that a shift of these industries into other locations with lower energy taxes will have no environmental benefit. At the same time, it highlights the potential trade-offs with other policy objectives – in this case the goal of an energy tax to reduce energy use, and the fact that lowering that tax for those that consume most energy somewhat defeats its purpose.

The effects of TEs to foster national energy security are ambiguous too – especially in the long-term. Tax incentives to increase the domestic share of energy supply will indeed lower the relative dependency on imports. But the distortion in the price signal may also provide a disincentive to save energy and thus leave the absolute demand for energy imports unchanged.

In contrast, incentives for investments into and the production of renewable energy are likely to increase energy security as well as to promote the transition to a low carbon economy – provided they are sizable enough to affect economic decisions. The same applies for tax benefits to support measures that increase energy efficiency. US federal tax credits for 10% of the cost, up to 500 USD, for insulation; tax deductions up to 1,000 USD for insulation offered by the State of Indiana; and the Residential Energy Tax Credit up to 1,500 USD per device offered by the State of Oregon for eligible energy-efficient devices are cases in point.[73]

Finally, as is the case with other TEs such as those channeled through VAT, tax incidence has a crucial role in the effectiveness of these schemes. Research on the incidence of excise taxes is a case in point. The analysis of TEs in the context of excise taxation is similar to the one regarding VAT. Nevertheless, excise taxes present some particularities that are worth mentioning. For example, excise taxes are designed to address externalities and, thus, have a "regulatory" dimension. Moreover, excise taxes are usually levied on goods with a very inelastic demand. Thus, distributional concerns are likely to be considerable and, at the same time, the deadweight loss arising after applying such a tax is likely to be relatively small. When it comes to tax incidence, under perfect competition, excise taxes (such as

[72] See e.g. Di Bella et al. (2015) who find that "energy subsidies were equal to about 45 percent of spending in education and health for the average [Latin American and Caribbean] country, […] about 80 percent for the average LIC country, and about 110 percent for oil producer countries that ranked lower in measures of institutional quality."

[73] Energy Star (2016), Indiana Office of Energy Development (2016), Oregon Department of Energy (2016).

those levied on gasoline, cigarettes, or alcohol) are fully shifted to consumers. Interestingly though, under oligopolistic market structures (which is often the case for these goods), and depending on the elasticities of demand and supply, these taxes can be undershifted (overshifted) i.e. the reaction of the price can be less (more) than proportional with respect to the variation in the tax rate.[74]

Efficiency

Fossil fuel-related TEs are subject to doubts with regard to the goals that they pursue as well as their effectiveness in reaching them. They trigger a similar debate concerning their efficiency. TEs to increase energy access, e.g. through reduced VAT rates on energy products, may reach the lower-income households they target. They will, however, also benefit everybody else and thus result in significant leakage. Indeed, empirical evidence on the distributive impact of fossil fuel subsidies – including both direct transfers as well as tax privileges – suggests that energy TEs are often regressive. In Argentina, Castro and Barafani (2015) estimate that the households making up the top 20% in the income distribution absorb more than 30% of energy subsidies, while the bottom 20% receive just over 10%. The authors also point out a regional distributional effect: More than half of the subsidies are allocated to the Buenos Aires Metropolitan Area, where subsidies per inhabitant are double those received, for instance, in the poorer regions such as northern Argentina. A similar situation is observed in the rest of Latin America. In Venezuela, the richest 20% of the population receive six times more fuel subsidies per person than the poorest third of the population. In Bolivia, the poorest 40% of households receive around 15% of total fuel subsidies; and in Haiti, about 90% of fuel subsidies are captured by the richest 20% of households.[75]

Moreover, targeted support for fossil fuel production and consumption come along with significant negative externalities. Coady et al. (2015) estimate the total social costs of global fossil fuel use that are not accounted for through market prices to be above 5 trillion USD. TEs for fossil fuels make this distortion even larger.

In contrast, tax benefits for renewable energy and energy efficiency are designed to reduce this externality. To what extent they are the most efficient instruments in targeting this objective remains subject to debate. While many countries offer fiscal support for renewables and energy efficiency, not all of them do so through TEs, but rather based on direct transfers. A comparison between the US and Germany provides a case in point. Whereas the US Government offers federal tax credits for residential energy efficient property, Germany has used loan reductions, loan reliefs and grants through the KfW as the main pillar of its programs in this field. Similarly, the US offers tax credits for the investment

[74] Fullerton and Metcalf (2002).
[75] Di Bella et al. (2015).

into and the production of renewable energy, while Germany has been using feed-in-tariffs as its cornerstone to expand the country's renewable energy market. A ranking of these and further instruments in terms of efficiency will be a key aspect to explore for further research in this field. The extent to which the different instruments change economic decisions and to which they benefit free riders who would have taken these decisions anyhow, will be an important element in this analysis.

Finally, further analysis is also needed to evaluate the distributional impacts of TEs for renewables and energy efficiency. As described earlier, tax benefits for fossil fuels are often regressive. The same may be true, but is currently under-researched, for tax incentives focused on renewables and energy efficiency.

3.3 HEALTH TAX EXPENDITURES

Health care spending has been growing steadily across the world.[76] Increasing coverage, advances in medical technology as well as the impact of an aging society are among the main drivers of this development. The accompanying expansion of government health care spending has put public healthcare schemes at the heart of the policy debate. Discussions around Medicare and Medicaid in the US and the National Health System in the UK are cases in point.

Nevertheless, as mentioned by a recent report by the US Congressional Research Service, "while much attention is being paid to the budgetary cost of outlays from the largest federally funded health programs (Medicare and Medicaid), the implicit subsidies in the Internal Revenue Code for the provision of private and publicly provided health care are sometimes overlooked in public debates."[77]

Health related TEs are often designed to subsidize the cost of private health insurance. They also aim at reducing the cost of private health related activities that may have positive spillover effects for society. In the US, the Joint Committee on Taxation identifies 14 health TEs for 2016. The list includes exemptions of employer-sponsored insurance (ESI) contributions from income and payroll taxes; refundable tax credits for insurance purchased through health benefit exchanges; as well as deductions for medical and long-term care expenses, among others.

The TE for ESI – the largest federal TE in the US – accounted for 146 billion USD in 2015 and is forecast to increase to 169 billion USD in 2019. Refundable tax credits for insurance purchased through health exchanges amounted to close to 30 billion USD in revenue

[76] World Bank (2016).
[77] Lowry (2016), p. 1.

foregone in 2015 and are expected to increase to 84 billion USD by 2019.[78] The rise of health-related TEs in the US has been significant during the last 40 years, increasing on average, at an annual rate of 7.5% in real terms during the 1974-2014 period. As a share of total tax revenue, they rose from 1.9% in 1974 to 8.9% in 2014.[79]

State tax break for nonprofit hospitals, i.e. TEs for hospitals that operate under nonprofit status and provide community benefits such as charity care for low-income people, research and professions training in exchange for their tax-exempt status, are further cases in point. A recent research paper shows that the overall value of these schemes – ranging from 21 million USD per hospital in Massachusetts to 10 million USD per hospital in Arizona – has doubled over the course of the past decade in the US, jumping from close to 13 billion USD in exemptions at federal, state and local levels in 2002 to close to 25 billion USD in 2011.[80]

In Italy, the Tax Credit for Medical Expenses and Health Assistance accounts for over 2 billion EUR or 0.15% of GDP.[81]

Similarly, Japan allows households to deduct medical expenses beyond 100,000 JPY (960 USD) a year from taxable income. On top of this, Japan's government has recently proposed an additional tax break for the purchase of medicine available without a prescription that should reduce the number of hospital visits to treat minor illnesses.[82]

Likewise, India grants a tax deduction for health insurance premiums paid for oneself, as well as spouses, children and parents, which was increased in 2015 from 15,000 INR (224 USD) to 25,000 INR (373 USD).[83]

Goal Alignment

Key goals of health related TEs include the expansion of health insurance coverage as well as increasing affordability of health services. Both objectives seem perfectly aligned with a sustainability agenda.

An extensive strand of literature highlights the positive effects that health has both on economic growth and development and hence of health insurance coverage.[84] Reaching universal health coverage is a particularly important issue towards which also low- and middle-income countries have been progressing. The Brazilian 1988 reform that established the Unified Health System (Sistema Único de Saúde) is a case in point. Before the reform, half of the population had no health coverage. Two decades after its implementation, more

[78] See Lowry (2016).
[79] Lowry (2016).
[80] Rosenbaum et al. (2015).
[81] Tyson (2014), p. 7.
[82] Nikkei Asian Review (2015).
[83] Dhawan (2016).
[84] See, for example, Bloom et al. (2004) and Reeves et al. (2015).

than 75% of the country's population exclusively get health care coverage through this system."[85]

Effectiveness

Empirical evidence suggests that TEs for employer-sponsored insurance have been quite effective in encouraging employers to offer health coverage to their employees.[86]

The TE for ESI in the US, for example, is often highlighted as the key factor behind the existing system of employer-provided insurance. Many argue that phasing out this scheme by taxing health insurance benefits would reduce the incentives for employers to offer health insurance to their employees. Gruber (2010) states that "this will leave employees without access to actuarially fair pooling mechanisms and at the whim of the non-group market. But the non-group market may exclude those who are sick, leading to a large welfare cost from the reduction in insurance to those who value it most."[87] The author estimates that removing the ESI exemption would reduce the number of individuals with ESI by 15 million. This impact would be somewhat mitigated by the fact that a number of those losing employer insurance will get insurance through other channels. He estimates that roughly 30% of those losing ESI would choose to purchase non-group insurance or move to public coverage and, hence, roughly 70% of those affected by the elimination of the exclusion would become uninsured.

Similarly, Stebbing and Spies-Butcher (2010) argue that the Australian Private Health Insurance Tax Rebate (PHITR), a tax rebate for private health insurance premiums, extends consumer choice and shifts resources to private service providers. Together with other reforms, this scheme has increased private health insurance coverage since its implementation.

Moreover, Goda (2011) assesses how the generosity of US state TEs for private long-term care insurance impacts on private coverage and Medicaid's costs for long-term care. Applying a simulated instrumental variables approach, the author finds that tax subsidies across US states raise coverage rates by 28%, on average. Nevertheless, he concludes that the positive impact of health TEs on coverage rates is driven by high income and asset-rich individuals, populations with low probabilities of relying on Medicaid.

In addition, Reeves et al. (2015) highlight a positive externality created by health TEs through VAT that is likely to be particularly relevant for low- and middle-income economies. "…in the absence of tax exemptions for health care, consumption taxes, and infant

[85] WHO (2010).
[86] Sheils and Haught (2004).
[87] Gruber (2010), p. 7.

mortality are even more strongly associated…whereas this association disappears where health care is exempt..."[88]

Efficiency

As for efficiency of health TEs, the evidence is mixed. On the one hand, by pooling risk among more employees and reducing administrative costs, the ESI reduces premium costs and, hence, may create efficiency gains.[89]

Likewise, Rosenbaum et al. (2015) show that tax-exempt hospitals more than offset the cost of TEs granted to hem (i.e. 25 billion USD in 2011) and provided 62 billion USD in community benefits in 2011.[90]

On the other hand, empirical evidence suggests that health TE schemes are highly regressive. Using microsimulation techniques, Sheils and Haught (2004) show that in the US, health-related TEs are mainly captured by higher-income households, which are most likely to have employer-sponsored coverage. Households with incomes of 100,000 USD or more (roughly 14% percent of the population) account for 26.7% of all TEs for health. Similarly, Gruber (2010) argues that the tax exemption for ESI is highly regressive, with 5/6 of the benefits being captured by the top 50% of the income distribution. He concludes that eliminating or capping this exclusion could both raise government revenue and improve the progressivity of the tax system.[91]

Miller and Selden (2013) move one step further and try to identify the channel behind the regressive effect of these schemes. The authors show that in the private sector, tax subsidies for employer-sponsored health insurance disproportionately flow to workers in i) large establishments and ii) establishments with relatively high wage or full-time workforces.

Finally, schemes such as the ESI could also lead to economic inefficiency if they reduce workers' mobility because their employer provides a low-cost or comprehensive health plan.[92]

Previous research on health-related TEs is heavily concentrated on the US, mainly due to the magnitude of the US ESI scheme. Nevertheless, these tax benefits are also implemented in many other countries, where they present similar issues. Stebbing and Spies-Butcher (2010), for instance, argue that although more than 40% of the Australian population is covered by private health insurance and, hence, takes advantage from health TEs, the largest part of the benefits are captured by higher-income earners.

[88] Reeves et al. (2015), p. 277.
[89] Lowry (2016).
[90] Rosenbaum et al. (2015).
[91] See also Miller and Selden (2013).
[92] Lowry (2016).

Likewise, Uemura (2009) states that a significant number of "hidden subsidies" in Japan are paid out to high-income households in the form of deductions for medical expenses.

In Brazil, in 2010, 75% of the population exclusively relied on the Unified Health System to get health care coverage. Roughly 20% of the population opted for the private sector which is seen as a system of superior quality. Even though people buying private insurance still contribute to the Unified Health System through their income taxes, they get a tax rebate that has regressive redistributive effects because the private system is exclusively affordable for high income people.[93]

In some countries, these schemes have already been under scrutiny in order to identify potential reforms that could tackle some of the issues mentioned before. In the US, as highlighted by Gruber (2010), for many years both economists as well as policy makers have been discussing a reform package for the ESI scheme. President Bush's 2008 budget explicitly proposed to replace the ESI exemption with a deduction of 7,500 USD for individuals holding health insurance. One year after, the Senate Finance Committee suggested to partially fund its expansion of health insurance through a cap on the exemption of high cost insurance, and ended up introducing a "Cadillac tax, an excise on high-cost insurance plans (with premiums of more than 8,500 USD for singles and 23,000 USD for families) levied on insurers."[94]

The Canadian province of Ontario is another case in point. Ontario levies an Employer Health Tax, a payroll tax on remuneration paid to employees and former employees, to partially fund the Ontario Health Insurance Plan. The existing tax exemption for this tax has recently been capped so that private sector employers with annual payrolls over $5 million are no longer eligible for this benefit as long as they are not charities.[95]

3.4 HOUSING TAX EXPENDITURES

Housing TEs are often linked to homeownership and frequently among the largest TEs channeled through PIT. They comprise mortgage interest deductions (MID) from taxable income, as well as provisions in many countries that imputed rental income of homeowners is not taxed. They are also granted through tax relief for expenses incurred for the purchase of a home (e.g. legal fees, land transfer taxes), deductions of property taxes from the income tax base, as well as non-taxation of capital gains out of home sales.[96]

In addition to provisions benefitting homeowners, TEs are also granted to the suppliers and purchasers of rental housing. Rebates on sales tax for newly constructed rental property in

[93] WHO (2010).
[94] Gruber (2010), p. 1.
[95] http://www.fin.gov.on.ca/en/tax/eht/
[96] See e.g. Tax Policy Center (2016), Salvi del Pero, A. et al. (2016), Government of Canada (2016), US Treasury (2015).

Canada, credits for low-income housing investments in the US, and exemptions on income from new dwellings rented to low and moderate income households in Australia are illustrations for that.[97]

TEs related to housing are substantial. In the US, 2015 tax subsidies for housing represented the second-largest TE category accounting for nearly seven times the amount granted for education TEs. The three largest tax expenditures for housing are the exclusion of net imputed rental income (almost 100 billion USD in revenue foregone in 2015), the MID on owner-occupied homes (almost 60 billion USD - see Box III.2), and the capital gains exclusion on home sales (37 billion USD).

In Belgium, housing-related tax expenditures are estimated to reduce revenue from personal income taxation by 5%. In Spain, the corresponding figure amounts to 7.5%.[98]

Goal Alignment

TEs in the area of housing are often justified with the positive externalities allegedly created by homeownership. Spillover effects that homeownership are expected to trigger for society through e.g. better outcomes for children (Haurin et al., 2002), community and political engagement (Engelhardt et al. 2010) and lower crime (Ni and Decker, 2009) are cases in point. Homeownership is also often mentioned as an important pathway for low-income and minority households to build up wealth.[99]

At the same time, the evidence on the effects of homeownership is mixed. Barker (2013) argues that children of homeowners are not necessarily better off and that homeownership may have both positive and negative effects on them. The net result is an empirical matter, and while earlier studies seemed to support the notion that children profit from homeownership, more recent research casts doubt on this hypothesis.

Homeownership may also have a negative impact on labor mobility and thus employment. Indeed, Blanchflower and Oswald (2013) argue that "rises in the home-ownership rate in a U.S. state are a precursor to eventual sharp rises in unemployment in that state. The elasticity exceeds unity: a doubling of the rate of home-ownership in a U.S. state is followed in the long-run by more than a doubling of the later unemployment rate."

Finally, home equity often accounts for a large share of a family's total wealth. This may reduce the optimal diversification of its investment portfolio and, thus, increase vulnerability to economic shocks – particularly for low-income households.[100]

[97] Government of Canada (2016), p. 229, US Treasury (2015), p. 10, and Australian Treasury (2016), p. 38.
[98] European Commission (2015).
[99] See e.g. Herbert et al. (2014), Atkinson and Greer (2015).
[100] Barker (2013). A more detailed discussion on the effects of homeownership is provided by Andrews and Caldera Sánchez (2011).

Effectiveness

While the goal of homeownership of many housing-related TEs is in itself controversial, their effectiveness is also subject to debate. A key reason for that is due to the fact that tax reliefs for homeowners often take the form of a deduction against earned income rather than a credit. This is a crucial difference. Deductions reduce taxable income and, hence, their impact depends on the taxpayer's marginal tax rate, which is an increasing function of income. Credits instead, reduce taxes directly and do not depend on tax rates. As a result, TEs granted as deductions mainly benefit higher-income households that could often afford a home without assistance and, thus, have a marginal effect on homeownership rates.[101] Indeed, their impact may even be negative if the tax reliefs translate into higher real estate prices, which would make homeownership less affordable for lower income sectors. Indeed, European Commission (2015) reports that "in general, as a result of generous tax reliefs and exemptions, and given the low level of recurrent property taxation, owner-occupation appears to be undertaxed compared to other private investments. While promoting homeownership might be considered an important policy objective, it is not unlikely that tax breaks granted for this purpose will instead cause prices to rise, particularly when supply is rigid, thus ultimately making it more difficult for people to become homeowners, especially younger and less well-off households."[102]

Other schemes appear to be more benign. The US First-Time Homebuyers Tax Credit is a case in point. This scheme – that was in place during the 2008-2010 period – was particularly successful in directing homeownership tax benefits to low- and moderate-income homebuyers because it mainly benefited those with incomes under 100,000 USD.[103]

Efficiency

The regressive character of many TEs for homeownership is not only a key cause explaining their limited effectiveness, but also the central driver for one of their most important side effects: negative distributive consequences. The fact that in Belgium mortgage interest tax relief accounts for 0.2% of disposable income for the bottom quintile and for 2% of disposable income for the top quintile provides an illustration.[104]

Likewise, simulations of the redistributive impact of eliminating housing related TEs in Italy show that this measure would particularly affect the top income decile, as they are benefiting the most from the current scheme.[105]

[101] See e.g. Harris and Parker (2014) and Andrews et al. (2011).
[102] European Commission (2015), p. 43. See also Andrews and Caldera Sánchez (2011).
[103] Atkinson and Greer (2015). Baker (2012) argues that although there was a sharp jump in home sales right after the implementation of the scheme, its success in spurring home buying and stopping the downwards pressure in home prices was only temporary.
[104] See also European Commission (2014a), p. 72.
[105] European Commission (2015).

The same applies to the MID (see Box III.2) and the capital gains exclusion on home sales in the US. The latter – a tax break allowing homeowners to pay no taxes on the first 250,000 USD in capital gains (500,000 USD for married households filing jointly) when they sell their primary residence after having lived in it for at least two of the five years immediately preceding the sale – tends to benefit upper-income households. All else equal, these households tend to own relatively more expensive houses and, hence, take more advantage of this scheme.[106]

Furthermore, housing TEs create negative externalities on the environment. Tax benefits targeting real estate often lead to an overconsumption of housing, with households choosing to live in more expensive and larger homes than they would have done otherwise.[107] Albouy and Hanson (2014) show that, the federal tax treatment of owner occupied housing in the US induces the average household to consume housing at a rate roughly 8% above the efficient one.

In addition, TEs for homeownership lead to an underinvestment in non-housing industries. Often, households that are eligible for this kind of tax benefit artificially increase the level of real estate investments instead of investing into potentially more productive assets.[108]

Finally, these schemes are likely to artificially increase the level of exposure to mortgages and indebtedness, as well as the volatility of real estate prices. In Switzerland, for instance, the tax system creates strong incentives for homeowners to maintain large unamortized mortgages and to invest their savings instead into third-pillar pension funds or other tax privileged investment vehicles, resulting in high gross indebtedness.[109] Similarly, Alpanda and Zubairy (2016) find that eliminating the MID in Canada would be the most effective reform policy in raising tax revenue, and in reducing household debt, per unit of output lost, compared to other alternatives such as increasing property tax rates, eliminating the depreciation allowance for rental income, instituting taxation of imputed rental income from owner-occupied housing and eliminating the property tax deduction. Van den Noord (2005) presents a theoretical model of the housing market showing that price variability of owner-occupied homes increases with the size of the associated tax breaks.

Against this background, proposals to reform housing TEs or phase them out abound. Vujanovic (2016) proposes "to impose a ceiling on expense claims, so deductions cannot exceed taxes paid on imputed rents."[110] Rose (2015) suggests that "Congress should reduce the tax savings that accrue to the most affluent owner households [and] allocate the increased federal revenue to the existing housing assistance programs that subsidize the rents of low income renters. The result of this shift in federal housing policy will be that

[106] Tax Policy Center (2016).
[107] See Waltert et al. (2010) and Albouy and Hanson (2014).
[108] OECD (2011).
[109] Vujanovic, (2016).
[110] Vujanovic (2016), p. 23.

more low income families who rent their housing will receive much-needed rental assistance."[111]

Box III.2 The US Mortgage Interest Deduction (MID)

The second-largest housing-related TE in the US (and one of the biggest among all TEs in the country) is the MID that subsidizes the debt incurred to purchase (or renew) an owner-occupied home.[112] The MID allows taxpayers to deduct mortgage interest payments on i) debt used to purchase or refinance a primary or secondary home (up to 1 million USD), and ii) debt not used to buy, build, or improve a home, called "home equity debt"(up to 100,000 USD).[113]

In 2015, the revenue forgone by the federal government through this scheme was nearly 60 billion USD out of 246 billion USD forgone through all TEs for housing.[114] On top of this significant fiscal cost, the MID scheme raises several concerns both in terms of its effectiveness and regarding the side effects it creates.

Empirical evidence indicates that the MID has a marginal impact on homeownership. If anything, this scheme only boosts homeownership tenure among higher income households, which are not its primary target group.[115] Indeed, around 50% of homeowners with mortgages in the US – mainly those from middle and lower-income households – receive no benefit from the MID.[116] By construction, only those households whose combined itemized deductions exceed the standard deduction are eligible.[117] In 2013, the standard deduction was 12,200 USD for married filers and half of it for single ones. Hence, lower-income taxpayers, whose combined itemized deductions are very likely to be under those thresholds, do not benefit from the scheme.

Moreover, the value of the deduction for a taxpayer is based on her marginal tax rate i.e. the deduction is worth more for taxpayers in higher tax brackets. The Tax Policy Center estimates that more than 70% of the benefit of the MID scheme is captured by the highest-earning 20% of households.[118] Similarly, Hilber and Turner (2014) find that the MID has the expected positive effect on homeownership in less regulated cities (i.e. with highly elastic housing supply) but only for higher-income sectors. On the other hand, in more regulated markets it has an adverse effect on homeownership, and no effect when it comes to lower-

[111] Rose (2015), p. 10.
[112] Marples (2015) provides a detailed overview of TEs in the US.
[113] IRS (2016b).
[114] US Treasury (2015).
[115] Hilber and Turner (2014).
[116] Harris and Parker (2014).
[117] In the US, taxpayers can choose between the itemized deductions and the standard deduction systems. An itemized deduction is an eligible expense (from a list of allowable items) that taxpayers can report on their federal income tax return in order to decrease their tax liability.
[118] Tax Policy Center (2011).

income earners, no matter the regulatory status of the city in which they reside. Hence, the authors conclude that this scheme is a costly and an ineffective policy to promote homeownership and improve social welfare.

In addition, this scheme may also have a negative impact on the environment as the tax savings are an increasing function of the costs of the house, which in turn are related to its size.[119] As a result, the scheme also creates negative ecological externalities, e.g. in terms of land use, energy use, and thus emissions.[120]

Finally, Bourassa and Yin (2008) show that this scheme has a significant effect on house prices and, thus, reduces the homeownership rate of young (and poor) households. Indeed, the MID is likely to induce excessive leverage by lowering the cost of debt financing. There is evidence showing that homeowners with sufficient financial assets to repay their mortgages keep on carrying them because of the tax benefits from doing so.[121] Some argue that the financial incentives granted through the MID scheme encouraged the speculative behavior that ended up being one of the main triggers of the US subprime crisis.[122]

Phasing out the tax benefits granted through the MID scheme has long been a hot topic in the US. Green and Vandell (1999) find that the replacement of the MID with a revenue-neutral tax credit would lead to a 3 to 5 percentage points increase in homeownership rates.

Atkinson and Greer (2015) propose that the US Congress should reform the MID scheme in the spirit of the First-Time Homebuyers Tax Credit, and turn it into a yearly refundable credit that would increase homeownership rates for low- and moderate-income households.

Similarly, Fischer and Huang (2013) argue that replacing the MID by a tax credit for mortgage interest, reducing the amount of interest it covers and making second homes ineligible would be a fairer and more efficient alternative to the actual scheme. Nevertheless, although "…proposals [to reform the MID] would generate large amounts of revenue and essentially remove the current deduction's incentives for debt and overinvestment in housing … they would also eliminate tax benefits for large numbers of middle-income homeowners and be very difficult politically to enact."[123]

[119] Stansel and Randazzo (2011).
[120] See Mann (2000) and Albouy and Hanson (2014).
[121] Poterba and Sinai (2008).
[122] See, for example, Blundell-Wignall et al. (2008) and Morrow (2012).
[123] Fischer and Huang (2013), p. 6.

3.5 INNOVATION TAX EXPENDITURES

Innovation TEs aim at boosting innovation through research and development (R&D). In concrete, they offer a reduction of the firm's tax liability depending, for instance, on the eligible firm's expenditure on R&D, or on the income earned through intellectual property.

These benefits are usually granted through allowances and credits. In some cases, they are also channeled through accelerated depreciation schemes of R&D capital expenditures. In the EU, R&D tax credits are the most widely used channels for innovation-related TEs (in place in 16 countries), followed by enhanced allowances (14 countries), patent boxes (eleven countries) and accelerated depreciation (nine countries).[124] In Australia, the R&D tax incentive has two main components: i) a 43.5% refundable tax offset for certain eligible R&D entities with an aggregated turnover of less than 20 million AUD per annum, and ii) a 38.5% non-refundable tax offset for all other eligible R&D entities. Moreover, unused offset amounts can be carried forward.[125]

Unlike direct support of R&D through grants or loans, innovation TEs provide support for private R&D by lowering the ex-post costs of the investment i.e. they are delivered only after the R&D activity has taken place.

Usually, TEs for innovation are neutral in terms of the content of R&D activity being supported and they are designed to benefit all types of firms.[126] However, they are often designed to target a specific type of R&D cost (e.g. capital goods to be used in R&D activities is less often supported than those costs related to labor and other current expenditures) or group of firms (depending, for instance, on their size or profitability). For example, when it comes to OECD members, "the median tax subsidy rate is estimated at 0.19 for profitable and of 0.13 for loss-making SMEs, above the OECD median of 0.13 for large profitable firms and of 0.10 for large lossmaking enterprises."[127]

Although they are not among the most costly TEs, these schemes can be significant. In France, tax support for business R&D increased from 630 million EUR in 2000 to 5.4 billion EUR in 2013.[128] In the same year, tax relief for R&D in the UK cost the government 1.4 billion GBP.[129]

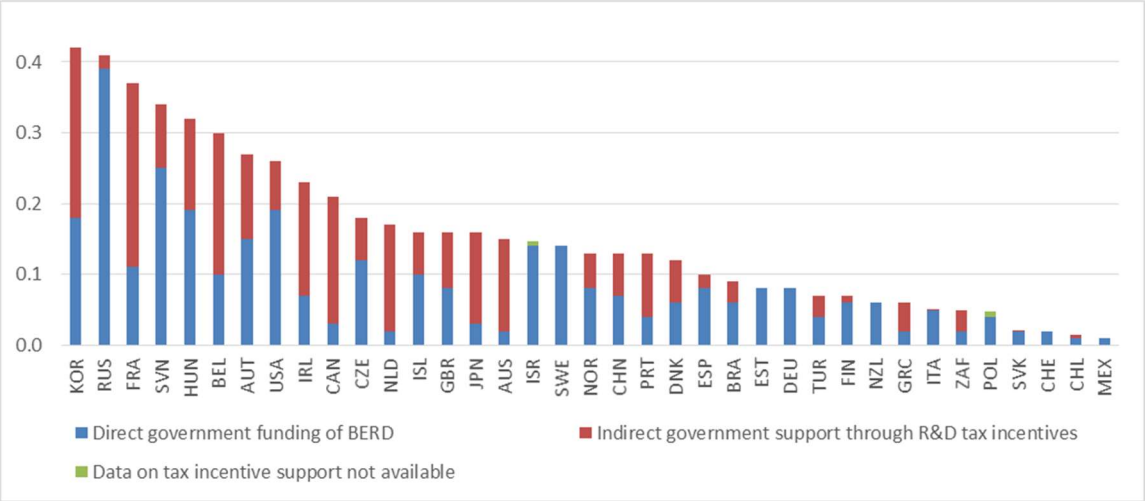
TEs for innovation are granted through either volume-based or incremental schemes. The former offer tax benefits for any amount of R&D spending and, hence, the total cost for the government is difficult to forecast. Incremental schemes, on the other hand, provide tax

[124] European Commission (2014a), p. 53. Germany and Estonia do not have any tax policy specifically designed at boosting innovation.
[125] Australian Taxation Office (2016).
[126] Köhler et al. (2012).
[127] OECD (2015c).
[128] OECD (2016b).
[129] Dechezleprêtre et al. (2016).

reductions only for the spending above a pre-determined threshold and, therefore, limit the costs for the government.

Indirect support for R&D through TEs has been gaining relative importance compared to its direct spending counterpart. As of 2015, 28 of the 35 OECD economies give preferential tax treatment to R&D.[130] Moreover, as can be observed from Figure III.1, in some cases the indirect support for R&D granted through TEs exceeds the one channeled through direct spending.[131] This is the case, for instance, in Australia, Belgium, Canada, France, Greece, Ireland, Japan, Korea, the Netherlands, Portugal and South Africa.

Figure III.1 Direct government funding of business R&D and tax incentives for R&D, 2013
(As a percentage of GDP)



Source: OECD, http://www.oecd.org/sti/rd-tax-incentive-indicators.htm

Goal Alignment

Innovation is a policy objective pursued worldwide, and is often seen to be at the heart of the sustainability agenda. Its role in the development of new green technologies, as well as its impact on job creation are cases in point.

At the same time, innovation can also be controversial from a sustainability viewpoint. It may cause disruption to existing companies and destroy jobs. It may also bring along environmental repercussions. The resource use of mobile phones and the energy use of information and communication technologies provide an illustration.

Indeed, some call for sustainable innovation rather than for innovation *per se.* The former, they argue, reduces the likelihood of negative externalities that certain types of innovation may trigger by better linking innovative activities with a sustainability agenda. In that

[130] OECD (2015c). Similarly, the number of non-OECD economies that implement TEs for R&D has been increasing as well and include countries like Brazil, China, India, Russia, Singapore and South Africa.
[131] See also Köhler et al. (2012).

context, Gagliardi et al. (2016) study the link between environment-related innovation and job creation at the firm level, using data covering 4507 Italian manufacturing firms as well as patent records during the 2001-2008 period. The authors find that "green" innovation – proxied by the number of environment-related patents – has a strong positive impact on long-run job creation.

Effectiveness

The effectiveness of R&D TEs depends on the elasticity of R&D spending with respect to the revenue foregone by the implemented scheme. The evidence on this elasticity is not conclusive. The European Commission (2014a) reports that "the vast majority of studies surveyed […] conclude that R&D tax credits are effective in stimulating investment in R&D. The estimates of the size of this effect are widely diverging and are not always comparable across countries due to differences in methodology. Studies that are more rigorous find that one euro of foregone tax revenue on R&D tax credits raises expenditure on R&D by less than one euro."[132]

The OECD states that the R&D intensity in the business sector (i.e. expenditures on R&D as a % of GDP) has a positive correlation (0.4) with the level of government support (direct + indirect) for R&D.[133] Bloom et al. (2002) find similar results by uniquely focusing on TEs for R&D. The authors assess the impact of fiscal incentives on the level of R&D investment using a panel of data of tax changes and R&D spending in nine OECD countries over the 1979-1997 period. They find evidence that TEs are effective in increasing R&D intensity. Their estimates suggest that a 10% fall in the cost of R&D raises the level of R&D by roughly 1% (10%) in the short-run (long-run). Similarly, in a more recent paper, Agrawal et al. (2014) exploit a change in the eligibility conditions for the Canadian Scientific Research and Experimental Development tax credit to analyze how tax credits impact small firms' R&D spending. The authors find that Canadian SMEs are sensitive to R&D tax credits. In their sample, those firms that became eligible for the benefit on a greater amount of qualified R&D expenditures (i.e. a 35% R&D tax credit rate up from 20%) increased their R&D spending by 15% on average, with respect to the period before the reform.[134]

Such evidence with respect to positive effects of R&D TEs notwithstanding, some caution is warranted in the interpretation of these findings. Some of the studies, for instance, may overestimate the impact of TEs because it may be difficult to disentangle the real effect on additional R&D spending from the relabeling of ordinary spending as R&D.[135]

[132] European Commission (2014a), p. 5.
[133] OECD (2015c).
[134] Agrawal et al. (2014), p. 32.
[135] The relabeling issue has been discussed in previous literature (see, for example, Griffith et al., 1995 and Hall and Van Reenen, 2000). Nevertheless, empirical evidence on the size of this issue is scarce. Interestingly, in a recent paper that uses UK data, Guceri and Liu (2015), find similar results than Agrawal et al. (2014) based on a sample of firms for which strategic relabeling is not significant.

Likewise, Lennox et al. (2015) show that, in China, firms benefitting from innovation related TEs are more likely to be scrutinized by the tax authorities. Hence, in order to reduce the likelihood of being on the tax authority's radar, tax aggressive firms are less likely to apply for R&D tax deductions.

Moreover, the effectiveness of these schemes varies across sectors and firm characteristics. For instance, Lokshin and Mohnen (2012) assess the impact of the Wage Tax and Social Insurance Act introduced in 1994 to stimulate R&D in the Netherlands. The authors find that the effectiveness of this scheme – a volume-based R&D fiscal incentive, i.e. a scheme that applies to the total amount of R&D spending – varies by company size. The program seems to be effective for small firms but not for larger ones. Kobayashi (2014) finds similar results for Japan, i.e. TEs for R&D do boost R&D spending for SMEs. Furthermore, the author finds that the effect seems to be particularly large for liquidity-constrained firms. Likewise, Chen and Gupta (2010) investigate the impact of R&D tax credits on firms' incremental R&D spending in Taiwan. The authors find that a raise in the benefit has a positive effect on the R&D spending of high-tech firms, but does not have the same positive effect on non-high tech firms. Interestingly though, Castellacci and Lie (2015) find exactly the opposite result. The authors apply a meta-regression analysis to study the sectoral heterogeneities in the effect of R&D tax credits on firms' innovation activities. They find that those empirical studies that have focused on a subsample of high-tech industries have obtained, on average, smaller estimates of the impact of R&D TEs.

Most of the studies assess the input additionality of these schemes rather than providing evaluations of output additionality that go one step forward by directly assessing the real impact on indicators related to innovation.[136]

Czarnitzki et al. (2011) and Dechezleprêtre et al. (2016) are exceptions. The former paper evaluates the impact of tax credits for R&D in the Canadian manufacturing sector. The authors focus on several innovation indicators such as the number of new products and the originality of innovation, among others. Their results show that firms benefitting from these tax credits perform better when it comes to most of the indicators compared to the counterfactual, where no R&D tax credits are granted. More recently, Dechezleprêtre et al. (2016) provide empirical evidence showing a causal impact of a UK tax relief for R&D on R&D spending as well as on innovation outcomes. The authors find that aggregate private R&D would have been roughly 10% lower if the scheme had not been implemented. When it comes to output additionality, they find that the R&D generated through this scheme created positive spillover effects on the innovation of technologically related firms.

Finally, one should also be cautious in interpreting evidence of a positive effect of R&D TEs on innovation in view of the possibility that it may be driven by a shift in R&D expenditure

[136] Köhler et al. (2012).

from one jurisdiction to the other rather than an increase in overall R&D investments. Although innovation TEs seem to be effective in boosting R&D spending in a particular jurisdiction, this effect is likely to be driven, at least partially, by a tax competition effect rather than a real boost to R&D spending. Wilson (2009) provides a case in point. The author finds that nearly all the increase in R&D spending within US states is explained by attracting R&D from other states. As it will be discussed more in detail in Box III.3, this is a particularly relevant issue when it comes to patent boxes.

Efficiency

Because of the spillovers of innovation on jobs, if effective, one could expect innovation TEs to create positive externalities on job creation.[137] At the same time, Goolsbee (1998) argues that R&D support policies are likely to have an impact on R&D related salaries rather than on the number of R&D related jobs. Similarly, Lokshin and Mohnen (2013) find a significant price effect of the R&D tax incentive scheme on the wages of R&D workers in Dutch firms. The authors obtain point estimates of the elasticity of R&D wages with respect to tax benefits ranging from 19% to 24%, depending on whether static or dynamic models and short-run or long-run estimates are considered.

On the other hand, Guceri (2016) finds some evidence of a positive effect on employment. The author evaluates the effect of R&D tax incentives in the UK by exploiting a reform, which increased the SME threshold from 250 to 500 employees. She finds that i) tax incentives increase R&D spending at the company level (on average, by roughly 20%) and ii) a weak effect suggesting that the additional spending on R&D may be, up to a certain extent, attributable to an increase in the number of R&D employees.

In addition, Gao et al. (2015) provide empirical evidence showing a positive correlation of firms' innovation and their tax avoidance level, with a larger effect for firms located in jurisdictions where R&D tax credits are in place.

Box III.3 Do Patent Boxes Work?

Patent boxes (PBs), also called license and intellectual property (IP) boxes, are TEs granting preferential treatment to corporate income earned through intellectual property. Like all innovation-related TEs, their stated primary goal is to boost innovation through R&D.

PB regimes vary considerably in the tax rate reductions they offer. In Europe, for example, the tax rate on corporate income for which PB benefits are granted ranges from 0% in Malta to 15.5% in France. Benefits through PBs are often considerably larger than those granted through other R&D tax incentives. The PB tax rate set at 20% of the standard tax

[137] Some countries even have job creation as a stated goal of R&D TEs. Brazil, for example, offers a deduction up to 160% of the total R&D expenditure for companies that increase the number of employees exclusively working on projects related to R&D.

rate in Belgium and in the Swiss Canton of Nidwalden corresponds to a 500% deduction of R&D expenses.[138]

Their scope and eligibility criteria also differ significantly from case to case. For instance, they may or may not include existing IP and capital gains as part of the eligible tax base. Moreover, they vary in the treatment of ongoing expenses relating to patent-based income and thus in the calculation of the applicable tax base.[139]

By construction, PBs grant tax benefits based on patents, which is an intangible good that is already protected. They thus provide support for industries that already benefit from IP protection rather than supporting R&D across all sectors of the economy. They also discriminate against both un-patentable and unsuccessful research efforts, and in view of the relative importance of multinational enterprises (MNEs) in the filing for patents, appear to be tilted against SMEs.

They may also have a bigger influence on the location of patents rather than real R&D activities as highlighted, for example, by Alstadsaeter et al. (2015). The authors use firm-level data for three sectors – pharmaceuticals, cars as well as information and communication technology – to estimate the impact of PBs on the patent filing strategies of firms. They find that PBs have a significant impact on attracting patents, but do not change real activity as multinational MNEs tend to shift the location of their patents without shifting their research operations. While this may make sense for an individual country in the context of tax competition it leads to the erosion of government revenues if a growing number of countries introduce similar schemes.

Similarly, Klemens (2016) warns that PBs may create numerous undesirable distortions because "firms can manipulate the ratio of research-to-ordinary expenses, lean toward incremental development over new products, eliminate ordinary expenses altogether and become non-practicing entities that make money through the legal system rather than producing products, or purchase business method patents that are useless for anything but reducing the tax rate on financial transactions".

Interestingly, and despite the empirical evidence highlighting their limited effectiveness, a growing number of economies have been implementing PB schemes. The current debate on PBs in Switzerland is a case in point.[140]

At the same time, both the OECD as well as the European Commission have voiced several concerns regarding PBs. In addition, the OECD/G20 Base Erosion and Profit Shifting (BEPS) Action Plan has put forward the so-called "nexus approach" to make R&D a requirement to benefit from PBs and thus to strengthen the links between this tax instrument and the real

[138] Evers et al. (2015).
[139] Evers et al. (2015).
[140] A PB scheme is also under discussion in the US. See, for example, Gravelle, 2016.

economy effects that it is meant to support.[141] To what extent such an approach may help to avoid the pitfalls of PBs and increase their effectiveness remains an open question.[142]

3.6 PENSION TAX EXPENDITURES

Countries worldwide offer TEs to support savings through private retirement plans. Such pension-related TEs provide tax benefits across three stages: when (i) part of the income is saved, (ii) investment income and capital gains accrue, and (iii) benefits are received. Governments can levy taxes at each of these stages. Standard precautionary saving is usually taxed on a TTE basis, i.e. the first two stages are taxed (TT), and the third one is exempt (E).[143] Private pensions, however, are often subject to an EET scheme, through which pension contributions as well as investment income and capital gains are tax exempt and only benefits (i.e. withdrawals from the pension) are taxed.

Given the size of private pensions in many countries, the total cost of retirement-related TEs can be significant. In the US, tax benefits due the exclusion of pension contributions and earnings from retirement plans from individual income tax amounted to close to 200 billion US$ in 2015.[144] For the same year, the Canadian government estimated the net cost resulting from non-taxation of income paid into registered pension and retirement plans, as well as non-taxation of the investment income from such plans to amount to close to 40 billion CAD.[145] European Commission (2015) estimates that phasing out such schemes would lead to an increase in PIT revenue in most Member States – with gains ranging from roughly 3% in Spain to 22% in Bulgaria.

As highlighted by Yoo and de Serres (2004), TEs to support pensions vary widely across countries. The authors assess the net tax benefit of pension TEs per unit (e.g. USD or EUR) of retirement contributions across OECD countries. Although the figures in the paper are likely to be outdated, it provides an interesting reference for the divergence of pension-related TEs within the OECD – ranging from nearly 40 cents per unit of contribution in the Czech Republic to around zero in Mexico and New Zealand.

Goal Alignment

The main goal of pension-related TEs is to encourage adequate savings for retirement. Empirical and experimental research highlights that households frequently under-save due to short-sightedness as well as underestimation of survival probabilities, among other

[141] OECD (2015a).
[142] For instance, Sanz-Gómez (2015) raises concerns regarding the compatibility between the nexus approach and EU law, particularly on state aid rules.
[143] Cremer and Pestieau (2016).
[144] US Treasury (2015).
[145] Government of Canada (2016).

factors.[146] Increasing the level of savings reduces the burden on public pension benefits. It also flattens fluctuations in household income and, hence, reduces its exposure to external shocks – a point that is particularly relevant when it comes to low income households.

While the goal of building resilience and ensuring livelihoods after retirement appears to be well aligned with a sustainability agenda, controversies exist whether households indeed save below their current means and future requirements. Crawford and O'Dea (2015) contradict conventional wisdom in a study that reports the cohort born in the 1940s holding "far greater wealth than is necessary to maintain their living standards into and through retirement".

Effectiveness

The empirical evidence on savings tax incentives points to low effectiveness of such schemes. Attanasio et al. (2004) show that, if anything, only a small share of contributions to tax-privileged savings accounts can be considered "new" savings that would not have been made without the tax benefits.

Using Danish data, Chetty et al. (2014) estimate that a dollar of tax expenditures increases savings by only one cent. The authors also report that automatic contributions (e.g. automatic employer contributions to retirement accounts) are more effective at increasing saving rates than tax subsidies. The authors highlight three main reasons to explain this difference. First, roughly 85% of individuals are passive in the sense that they save more when driven to do so by an automatic contribution, but do not respond to price subsidies. Secondly, there seems to be a crowding out effect, i.e. individuals who do respond to price subsidies mainly shift savings across accounts rather than increasing the overall level of investment in saving. Finally, active savers (those who respond to price subsidies) are planning and saving for retirement already.

Similarly, Duflo et al. (2006) argues that the tax benefits granted by the US government to subsidize saving (including tax deductions for contributions and a tax deferral on account earnings) does not lead low- and middle-income households to contribute to retirement accounts – the main reason being that the value of these tax benefits is negligible for families with low marginal income tax rates.

Moreover, a 2013 Economic Brief published by the European Commission states that "…[tax] loopholes in savings taxation typically change the composition of savings without much affecting its overall level, though it is sometimes claimed that tax incentives should favor 'long-term' saving."[147]

[146] Cremer and Pestieau (2016).
[147] Carnot (2013), pp. 4 and 5.

Efficiency

TEs for pensions tend to be regressive. Higher income earners contribute more to pension funds and, thus, are likely to reduce their tax liabilities more than other households through such schemes.

In the US, for instance, 68% of the TEs for employer-provided pensions are captured by the top income quintile.[148] Indeed, in a recent article, Turner et al. (2016) show that "… while there are very large differences in account balances between the wealthiest individuals (in terms of pension accounts) and typical individuals, the difference in tax subsidies is approximately 100 times greater than the difference in account balances, with some wealthy individuals receiving a lifetime tax subsidy of $100 million or more."[149]

European Commission (2015) assesses the effects of phasing out these TEs in France and Spain. The results show that pension related TEs have a double regressive component: First, from an intra-generation perspective, they favor higher income pensioners with respect to middle- and lower-income ones. Secondly, across generations, they favor pensioners over the working-age population, given the same decile in the income distribution.

Rowena et al. (2012) find evidence that individuals in the in higher tax brackets of PIT in the UK are more likely to become members of a pension scheme and, thus, to benefit from the tax reliefs for pension saving.

Some argue that limits on deductibility can reduce the regressive impact of these TEs, and, in fact, many countries do implement a cap on deductions. The UK for instance caps the limit on the amount of contributions at 40,000 GBP or 100% of your earnings, whichever is lower.[150]

A potential alternative to reduce the negative effect of these schemes on income distribution is given by matching contributions. Matching contributions can be provided independently of the individual's marginal income tax rate and, thus, are potentially more likely to boost retirement contributions for low- and middle-income individuals – hence increasing the effectiveness and reducing the regressive component of these schemes.[151] Duflo et al. (2006), for example, run a randomized field experiment to assess the effectiveness of matching contributions on the overall level of contributions. Their results show that the presence of a match significantly increases both participation and contribution levels.

[148] Harris et al. (2014).
[149] Turner et al. (2016), p. 30.
[150] https://www.moneyadviceservice.org.uk/en/articles/tax-relief-on-pension-contributions.
[151] For more details on matching contributions for pensions, see Hinz et al. (2013).

Box III.4 The Australian Superannuation Scheme

In Australia, retirement income is funded through personal savings, a government pension and the country's superannuation scheme. Super funds are financed through contributions by employers that amount to at least 9.5% of the employee's salary, as well as voluntary contributions by the employee. In some cases the government adds co-contributions such as the so-called low income Super contribution, i.e. an additional contribution of up to 500 AUD granted to any employee earning up to 37.000 AUD, no matter whether or not the employee contributes extra money to her Super.[152]

The contributions that employers must pay are allocated into the Super fund previously chosen by the employee. The Super money is invested by the Super funds and, thus, the contributions accumulate over the employee's working life. Once the preservation age – i.e. the age at which the employee can access her Super if she is retired (or has started a transition to a retirement income stream), which goes from 55 to 60, depending on the date of birth – is reached, the employee can withdraw the Super. There are three ways of withdrawing the accumulated Super: as a lump sum, as a retirement income stream (e.g. a monthly payment) or as a combination of both.

For most people, Super contributions are taxed at a lower rate than income. In concrete, most people pay a 15% tax on Super contributions (money going in), up to 30,000 AUD per financial year (35,000 AUD for people over 49 years old). Moreover, for people in the retirement phase, earnings and payments are tax free.[153]

These concessions granted by the government are estimated to cost the federal budget close to 30 billion AUD a year.[154]

Some argue that the introduction of the compulsory employer contributions and related TEs facilitated a rapid increase in pension savings in Australia, making the Australian pension fund sector the world's fourth biggest.[155] Indeed, by the end of 2013, the total assets within Australia's Super funds accounted for 1.8 trillion AUD, which was greater than the combined deposits of all Australian banks and the annual Australian GDP.

On the other hand, a large share of the tax concessions granted through this scheme are poorly targeted and, hence, leak to those that need them the least. According to the Financial System Inquiry, only 1 AUD in every 200 AUD of the cost of Super tax concessions goes to the bottom 20% of income earners, whereas more than 50% is captured by the top 20% (Australian Treasury, 2014). Ingles and Stewart (2015) point in the same direction. The authors assess the tax and transfer treatment of private superannuation retirement saving and conclude that a more coherent retirement tax and transfer system requires reducing tax concessions. Finally, some argue that these TEs create distortions not only in favor of higher income earners but also to advantage older generations because Super income is tax-free from age sixty onwards.

[152] https://www.ato.gov.au/Individuals/Super/In-detail/.
[153] https://www.ato.gov.au/Super/Self-managed-super-funds/Contributions-and-rollovers/Contribution-caps/.
[154] Australian Treasury (2016), p. 8.
[155] https://www.towerswatson.com/en-AU/Press/2014/02/Global-pension-fund-assets-hit-record-high-in-2013.

Recently, the Australian government has announced a package of reforms to reduce the cost of this scheme as well as to tackle its unwelcome side effects. Some of the announced measures include, for example, a 1.6 million AUD cap on tax-free retirement accounts. Anything above this threshold goes into another account, with investment income taxed at 15%.

The Government has estimated that the whole reform package would increase its revenues by 6 billion AUD over four years, and committed to reinvest half of this amount to make the scheme a fairer one. In particular, the government will allow people with Super balances below 500,000 AUD to catch-up on concessional contributions if they did not reach the proposed 25,000 AUD a year cap.

This being said, the impact the reform is uncertain. Whereas the Australian Government estimates that it will only affect 4% of Super account holders (roughly 550,000 Australians), the Association of Superannuation Funds forecasts this figure to be 1.25 million people.

3.7 WORK TAX EXPENDITURES

TEs related to work are part of a broader group of "Active Labor Market Policies" which unlike their passive counterparts (i.e. policies providing income replacement) aim at reducing benefit dependency. So called "making-work-pay" (MWP) TEs are designed to provide financial incentives "to take up jobs, to remain in work, to increase work effort, and to invest in education and training" (Barrios et al., 2015, p. 3).[156] Most of these schemes are introduced to support lower income individuals or households. Some are also targeted at fostering employment among women and young workers.

Work-related TEs are implemented worldwide. They usually take the form of tax credits or allowances in the context of PIT. While employment is an eligibility condition for all of them, their design varies from case to case. The French Prime Pour l'Emploi and the UK Working Tax Credit, for example, grant income-tested, refundable tax credits based on personal and family characteristics other than income. Slovakia instead, grants a tax relief that is purely based on income, and that gradually phases out as income increases.[157] France and the UK, apply means tests at both the individual as well as the household level. Means testing in Belgium and the Netherlands focuses exclusively on the individual.[158]

Work-related TEs through PIT are implemented worldwide and vary considerably across countries in terms of scope and size. In Spain and Hungary, they benefit around 95% of workers. Estimates for France, the UK, and Slovakia, are significantly lower at 20%, 14% and 9% of the working population, respectively. Average monthly tax credits under such

[156] As it is standard in the literature, we use the term "work-related TEs" and "make-work-pay TEs" interchangeably.
[157] Barrios et al. (2015).
[158] Astarita et al. (2014).

schemes amount to 9 EUR in Slovakia, and to 177 EUR in the UK – resulting in total revenues foregone of 19 million EUR and 1.8 billion EUR, respectively.

TEs related to work may also come as tax benefits in the context of CIT. Job creation tax credits as enacted by various states in the US – such as the state of Pennsylvania which provides a 1,000-USD-per-job tax credit to businesses that agree to create jobs within the next three years[159] – are examples.

Some work-related TEs are also channeled through VAT. Reduced VAT rates for sectors with a relatively high share of low skill workers (such as hotels and restaurants) are a case in point and are expected to have a positive effect on low skill labor demand. The analysis of the 2009 French VAT reform for the restaurant sector by Benzarti and Carloni (2016) provides an illustration (see Section 3.1). Reduced VAT rates for those sectors in which services are easily substituted by do-it-yourself work are further examples. Lower VAT rates decrease the market price of these services and, hence, reduce incentives for do-it-yourself work rather than buying them in the market. TEs channeled through VAT can be used to offset this effect so that high-skilled people do not end up substituting their more productive labor supply for more time allocated to low skill work at home.[160]

Goal Alignment

As discussed by European Commission (2003), market wages may sometimes be so low that together with other parameters (e.g. the level of unemployment benefits or the effective tax rates), accepting a job could end up with the individual receiving a lower net disposable income. Work tax benefits are aimed at addressing such issues by targeting low-income households or particularly vulnerable groups, and thus to foster employment, to give additional financial incentives to increase labor market participation and to "…support those who are at risk of poverty and social exclusion even when employed."[161] These objectives appear aligned with sustainability priorities and are generally uncontested.

Effectiveness

Empirical evidence suggests that work-related TE schemes do indeed foster employment and reduce the number of working poor. Numerous studies highlight the positive effects of the EITC in the US on raising employment and lifting families out of poverty.[162] Similarly, a recent paper by the Federal Reserve Bank of San Francisco assesses the impact of JCTCs implemented by state governments in the US between 1990 and 2007.[163] The authors find a positive cumulative effect of these credits on employment growth, although their impact is fully realized only several years after implementation. A study by the Economic Research

[159] Commonwealth of Pennsylvania (2016).
[160] Copenhagen Economics (2008).
[161] Astarita et al. (2014), p. 23.
[162] See e.g. Eissa and Hoynes (2005), Marr et al. (2015).
[163] Chirinko and Wilson (2016).

Institute in Ireland shows that the financial incentives to work created by the Irish tax system imply that four out of five unemployed jobseekers would benefit of, at least, a 40% increase in their earnings should they take up a job.[164]

At the same time, research highlights that impact certainly also depends on the scope and size of such schemes. In that context, OECD (2014) reports that the Korean EITC has limited impact because it only covers 4% of households, with total payments accounting for only 0.2% of government spending.[165]

Another aspect that is particularly relevant for the effectiveness of work TEs are the interconnections with other policies (see Box III.5) as well as other characteristics of the economy such as labor market structures and the business cycle. In the UK, for instance, since the beginning of the economic recession real earnings and, thus, household incomes have fallen considerably. Such a scenario should be taken into account when it comes to assessing the effectiveness of a MWP scheme, because "at the same time as these reforms have been introduced, weakness in the economy has meant that earnings have increased less quickly than benefit rates, which tends to make working less attractive."[166]

Finally, MWP schemes are designed to target vulnerable groups. Hence, the sensitivity of individuals with respect to potential stigma could considerably reduce take-up ratios and, thus, hinder the effectiveness of the scheme (Bhargava and Manoli, 2015).

Efficiency

Chirinko and Wilson (2016) show that the cost per job created by the JCTCs implemented by US states is roughly 16,000 USD, a lower figure compared to fiscal programs implemented at the federal level.

Nonetheless, whereas these policies proved to have positive effects on labor supply of specific targeted groups such as single mothers and primary earners in couples, there is also evidence showing strong negative effects on other groups of the society. For instance, MWP TEs usually create negative work incentives for secondary earners.[167] The main reason is that these schemes are usually means-tested at the family level. As discussed by Kurowska et al. (2015), because high taper rates on employment income (i.e. the rate at which one's maximum credit benefit is reduced as earnings increase) would imply high marginal tax rates, they generate strong income effects on secondary earners that end up having a disincentive impact both at the extensive and intensive margins. Based on microsimulations for the Polish tax benefit scheme of support for families with children, the authors show that a raise in the size of the tax benefit combined with the introduction of a

[164] Savage et al., 2015.
[165] OECD (2014).
[166] Adam and Browne (2013), p. 1.
[167] Haan and Myck (2007).

"double earner" premium may result in the scheme having a positive effect on labor supply both of first and second earners in couples.

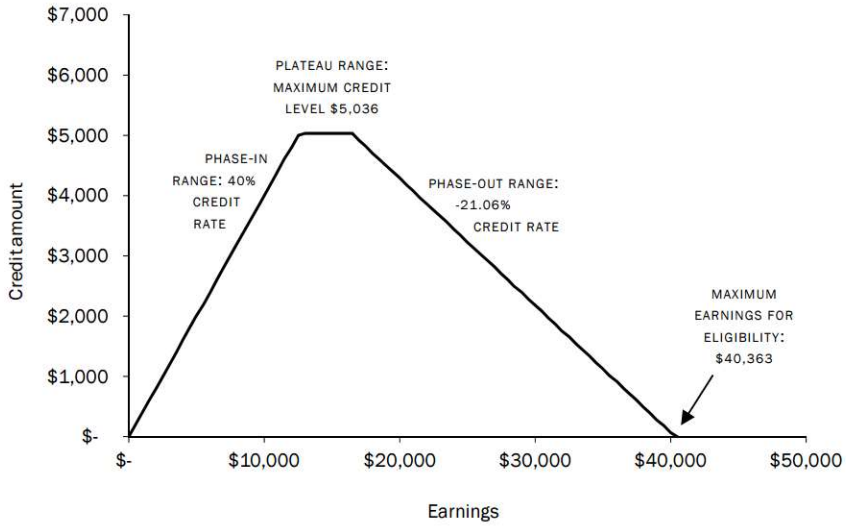
Furthermore, as discussed by Pearson and Scarpetta (2000), an additional "...inevitable consequence of increasing support for those with low skills is that the incentive to increase those skills is reduced."[168] Hence, as an additional side effect, MWP policies could end-up reducing human capital investment for lower-income individuals. In other words, TEs targeting low-wage jobs are likely to promote labor market dualisation by promoting low-wage and low-quality jobs (Carbonnier et al., 2016).[169]

Box III.5 The United States Earned Income Tax Credit

The EITC aims at providing additional financial incentives to work to low- and moderate-income families. It is granted as a refundable tax benefit, i.e. when the tax credit exceeds the amount of the tax liability, the difference becomes a tax refund.

As indicated in Figure 1, the EITC benefits are mainly based on the income level, with workers falling into three broad ranges of benefits: first, a "phase-in" range, where the EITC is computed as a fixed share of one's earnings; second, a "plateau" range, where a worker has already reached the maximum EITC amount and, thus, any additional earnings do not trigger an increase in the received benefit and, finally, a "phase-out" range in which the worker's EITC declines at a fixed rate until reaching zero.[170]

FIGURE 1: 2010 Federal EITC Credit Schedule for a Family with Two Qualifying Children



Source: Wicks-Lim and Pollin, 2012.

[168] Pearson and Scarpetta (2000), p. 22.
[169] See also Immervoll and Pearson (2009).
[170] Wicks-Lim and Pollin (2012).

This particular structure provides strong work incentives to unemployed workers, because it raises their take-home pay from becoming employed, regardless of the stage in which their income places them. Unlike the last two ranges, the phase-in range is the only one providing workers an incentive to work more, since the size of the EITC benefit grows as they earn more. As a result, as a side effect – and depending on the worker's preferences – for some individuals who are already employed the EITC may end-up being an incentive to reduce the number of worked hours.

In addition, the amount of the benefit depends on the structure of the household, e.g. it increases with the number of qualifying children who must be younger than 19, or younger than 24 and a full-time student, and must live with the beneficiary in the US. There is no age limit for disabled children. The maximum amount of credit for 2016 is as follows: 6,269 USD with three or more qualifying children; 5,572 USD with two; 3,373 USD with one, and 506 USD with no qualifying children.[171]

In 2014 the program accounted for 66.7 billion USD in revenue forgone for the federal government, which makes it one of the largest TEs in the country.[172]

There is a relatively broad consensus on the success of the scheme. According to Hoynes (2014) "[the EITC] may ultimately be judged one of the most successful labor market innovations in U.S. history."[173] Similarly, Marr et al. (2015) argue that by boosting the employment of single mothers, the EITC considerably reduces the number of female-headed households receiving cash transfers.

Nevertheless, Wicks-Lim and Pollin (2012) highlight shortfalls in current policies to provide households with a minimally decent living standard. The authors assess the interactions of the EITC and the minimum wage on a state-by-state basis, covering the 1997-2007 period. They focus on conditions for single mothers with a high school degree or less, which is a group – they argue – that is likely to benefit disproportionately from both relatively high minimum wages and EITC benefits. Their findings show that both the minimum wage and the EITC are associated with higher employment levels. A 10 percentage point increase in the state's EITC benefit rate increases weekly employment levels for this target group by between 1 and 2 hours, on average. At the same time, the authors conclude that "even after adding state and federal EITC benefits, this single mother's income […] would still cover just over half of the $41,400 that the average 3-person household needs to cover its basic needs."[174]

[171] https://www.irs.gov/credits-deductions/individuals/earned-income-tax-credit/eitc-income-limits-maximum-credit-amounts.
[172] https://www.eitc.irs.gov/EITC-Central/abouteitc.
[173] See Hoynes (2014), p.27.
[174] Wicks-Lim and Pollin (2012), p. 29.

4 Conclusion

TEs have been neglected within the fiscal policy literature. Research assessing the impact of these schemes on a broad sustainability agenda is even scarcer. Likewise, cross-country comparisons are strikingly rare.

This is partly explained by methodological issues such as benchmark choice, as well as limitations that are inherent to microsimulation techniques, e.g. the fact that microsimulation models are static and thus do not take into account behavioral changes of individuals.

In addition, TEs suffer from a significant lack of transparency as reflected in the very different standards of countries in TE reporting, both with respect to the quality and scope of the data they provide.

At the same time, TEs are costly and reduce public resources that are needed to reach other policy objectives. Moreover, even if their stated goals – e.g. promoting job creation, boosting innovation, reducing inequality, or fostering the use of renewable energy – are benign, they are frequently poorly targeted and thus less effective and efficient compared to policy alternatives.

This does not imply that these schemes should never be used. But it does highlight that they should be better scrutinized in terms of their fiscal cost as well as their goal alignment, effectiveness and efficiency. Momentum for fiscal policy reform has been increasing worldwide, both at the international and national levels. A review and, where appropriate, reform of TEs should be a central pillar in this context. Increasing transparency is a critical first step in pursuing this objective. Analysis of their economic, social and environmental impacts needs to follow to underpin policy reforms in this field. This note aims to make a contribution towards this goal by defining relevant questions and providing tentative answers. We hope that it provides a launch pad for further engagement on the topic.

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