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IMF Working Paper

International Taxation and Luxembourg's Economy

by Ruud De Mooij, Dinar Prihardini, Antje Pflugbeil and Emil Stavrev

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Fiscal Affairs Department and European Department

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Prepared by Ruud De Mooij, Dinar Prihardini, Antje Pflugbeil, and Emil Stavrev

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Abstract

Luxembourg receives ample investment from multinational corporations, in part due to some attractive features in its international tax rules. Around 95 percent of these foreign investments pass through Luxembourg via companies performing holding and/or intra-group financing activities. While their contribution to Luxembourg's economy is modest relative to their large overall balance sheets, they still generate around 3 percent of GDP in tax revenue, create almost 4500 direct jobs, and spend almost 3 percent of GDP on salaries and purchases of business services. Ongoing changes in the international corporate tax framework pose risks to these economic contributions, which this paper attempts to quantify. It also discusses options for reforms in Luxembourg's tax system that could help offset adverse revenue and economic effects.

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Keywords: Luxembourg; International Tax; Foreign Direct Investment; Special Purpose Entities.

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I. INTRODUCTION¹

Despite a comparatively high corporate income tax rate, Luxembourg receives ample investment from multinational corporations. This is partly due to various non-tax advantages, such as being the home to an international financial center with a well-integrated ecosystem, a skilled multilingual workforce, and a stable political and social climate. There are some attractive features in the tax system that are also important. In particular, a relatively generous participation exemption regime, low withholding tax rates on dividends, interest, and royalties, and a wide treaty network, which, overall, helps inbound payments into Luxembourg face relatively low withholding taxes in treaty partner countries.

Foreign direct investment in Luxembourg is largely held by special purpose entities, such as companies performing holding and/or intra-group financing activities. Indeed, around 95 percent of the multinational investments pass through Luxembourg through such entities. Such pass-through investments contribute less to Luxembourg's economy than greenfield investment would do. Nevertheless, due to their significant size, the contribution is non-negligible. For instance, this paper reports that special purpose entities generate around 3 percent of GDP in tax revenue, create almost 4500 direct jobs, and spend almost 3 percent of GDP on salaries and purchases of business services.

The international corporate tax system is gradually changing. This may carry risks to the contributions of special purpose entities to the Luxembourg economy and its government revenue base. For instance, globally coordinated measures against profit shifting and revisions in the US tax system already appear to be causing a re-routing of capital flows and reduced direct investment positions in Luxembourg. Reforms currently under discussion in the OECD's Inclusive Framework and in the European Union could also weigh on corporate income tax revenue. This paper attempts to quantify the effects of some of these potential international tax reforms.

As tax revenue from businesses could come under pressure—in addition to effects from the COVID crisis, both direct on revenues and indirect via its impact on developments in international taxation—options for revenue mobilization should be explored to structurally enhance the revenue base. This paper explores such options in four directions: changes in business taxes, greater use of environmental taxes, modernization of housing taxation, and individualization of the personal income tax system to increase female labor participation. These reforms have the prospect of supporting revenue during the recovery from the current crisis, as economic conditions permit.

The rest of this paper is organized as follows. Section II describes the system of business taxation in Luxembourg and discusses its performance in terms of revenue. It also elaborates on special

¹ This working paper summarizes the analysis of a Selected Issues Paper written as part of the 2020 Article IV Consultation Staff Report which was not published due to the Covid19 pandemic. The paper was prepared in the context of the IMF's work on international taxation in which Luxembourg authorities agreed to fully participate. This paper benefited from numerous fruitful discussions with staff of the Ministry of Finance, as well as other government and non-government organizations during IMF staff's missions to Luxembourg. Most of the work was conducted during the IMF consultation in late 2019 and early 2020. We are grateful for useful comments from Shafik Hebous, Michael Keen, Geerten Michielse, Moez Souissi, and Padma Sandhya Hurree-Gobin.

purpose entities and the role of taxation. Section III discusses trends in international corporate taxation and how it affects Luxembourg. Finally, Section IV discusses alternative options for revenue mobilization.

II. BUSINESS TAXATION IN LUXEMBOURG

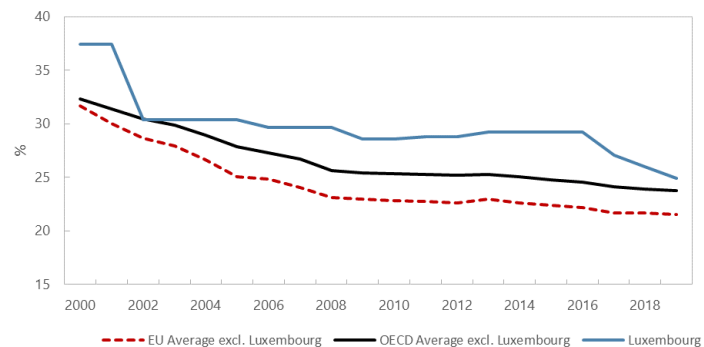
A. Domestic Tax Law

Corporate income in Luxembourg City is taxed at a combined rate of 24.94 percent, which slightly exceeds the EU and OECD averages. First, the national corporate income tax (CIT) rate in Luxembourg is 17 percent (gradually reduced from 21 percent in 2016) and applies to corporations with taxable income over EUR 200,000.² Second, a surcharge of 7 percent of the CIT rate is levied as a contribution to the unemployment fund, adding 1.19 percentage points to the CIT rate (7 percent of 17). Finally, all 102 municipalities impose a local business tax, which varies between 6.75 and 10.5 percent. The base is similar to the national CIT, but the tax is imposed on income over EUR 17,500 for corporations and EUR 40,000 for other businesses. In Luxembourg City, where the majority of businesses are located, the municipal business tax rate is 6.75 percent, so that the overall tax rate on corporate income is 24.94 percent. This is slightly higher than the averages in the EU (21.6 percent) and the OECD (23.7 percent) (Figure 1).

Effective tax rates on business income are close to the European average. Effective tax rates depend not only on the statutory CIT rate, but also on elements of the tax base, such as depreciation allowances, inventory valuation, interest deductibility and general tax incentives. Two effective tax rate measures are generally used to infer the distortionary impact on investment. First, the marginal effective tax rate (METR) measures the tax burden imposed on a marginal investment that just meets the required rate of return to be viable to undertake. In 2018, the METR in Luxembourg was 11.4 percent, which is slightly below the EU median of 12.2 percent (Figure 2a). Second, the average effective tax rate (AETR) measures the burden on a profitable investment. This matters for the inframarginal

Figure 1. Luxembourg, EU and OECD: Combined Corporate Income Tax Rate, 2000-2019

(In Percent)



Source: FAD Internal Tax Rates Database

² The rate is 15 percent for incomes below EUR 175,000. For income between EUR 175,000 and EUR 200,000, the rate is 15 percent for the part of the income below EUR 175,000 and 31 percent for the part above EUR 175,000 (so that the average rate at EUR 200,000 is exactly 17 percent).

location choice of, for example, multinational enterprises (MNEs). In 2018, the AETR in Luxembourg was 22.8 percent, which ranks as the 9th highest in the EU (Figure 2b).

Figure 2a. Luxembourg and EU: Marginal Effective Tax Rate, 2018

(In Percent)

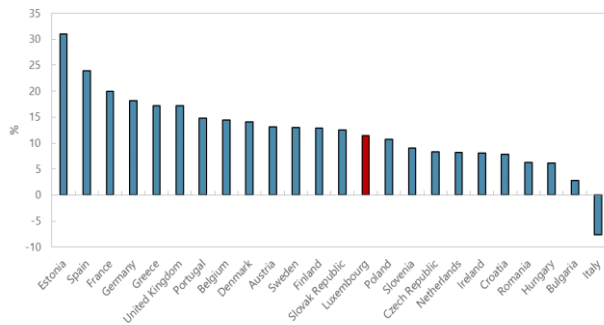
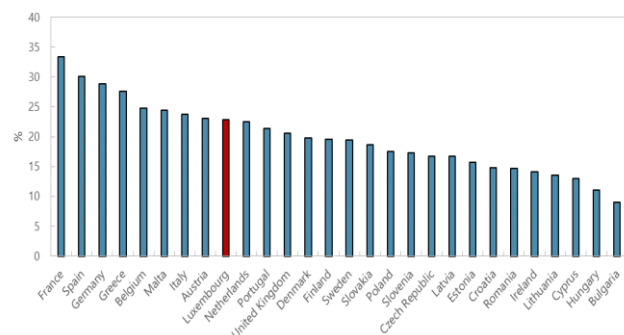


Figure 2b. Luxembourg and EU: Average Effective Tax Rate, 2018

(In Percent)



Source: Oxford University Centre for Business Taxation Tax Database. Source: European Commission.

A rare and complicated net wealth tax (NWT) applicable to corporations increases the tax burden and magnifies distortions. Corporations are subject to a net wealth tax at a rate of 0.5 percent applied to total assets minus liabilities of up to EUR 500 million; the rate is 0.05 percent for net assets above that. The net wealth tax can be reduced by the amount of CIT due in the previous year or if a company holds sufficient³ reserves for a 5-year period.⁴ The net wealth tax is uncommon internationally and, to the extent that it cannot be offset, adds to the distortions of the CIT. In fact, by adding to the effective tax burden on equity-financed investment (increasing the METR and AETR beyond what is shown in Figure 2) it magnifies investment distortions and the CIT bias toward debt finance.

Investment funds in Luxembourg pay a subscription tax on their net assets. There were 3779 registered funds at the end of 2019. Investment funds are commonly not subject to tax on the income they generate for their clients, as they merely perform an intermediary function. However, in Luxembourg investment funds pay a 0.05 percent subscription tax on their net assets. The rate is reduced to 0.01 percent for institutional funds and specialized investment funds, while institutional money market funds, exchange traded funds, pension funds, and microfinance funds are exempt from the subscription tax. Overall, 30 percent of the funds are subject to the 0.05 percent rate, 26 percent to the 0.01 percent rate, and 44 percent are exempt.

³ The corporation must allocate an amount corresponding to five times the NWT reduction in a special NWT reserve in the balance sheet.

⁴ The NWT is complemented by a minimum tax. For most Luxembourg corporations, the minimum NWT is progressive and ranges from EUR 535 (for a total balance sheet up to EUR 350,000) to EUR 32,100 (for a total balance sheet exceeding EUR 30 million). Corporate collective entities that own qualifying holding and financing assets exceeding both 90 percent of their total balance sheet and the amount of EUR 350,000 (mostly SOPARFIs, see later) pay a minimum net wealth tax of EUR 4,815.

Luxembourg allows a preferential treatment of income from intellectual property (IP) to stimulate innovation. The innovation box was introduced in 2018 as a replacement for a predecessor that did not meet the nexus requirements under the OECD-BEPS minimum standards. The new IP regime is in line with those standards. In the new scheme, qualifying IP income receives an 80 percent exemption from CIT and local business tax, as well as a full exemption from the NWT.

B. International Aspects

Luxembourg has a relatively generous participation exemption regime. In most advanced economies, qualifying dividends and capital gains received from foreign-owned related companies are exempt from CIT to prevent international double taxation. However, the conditions under which such exemptions are granted vary across countries (Table 1). In Luxembourg, these conditions are relatively mild. As foreseen by the EU parent-subsidiary directive, the participation exemption is granted if a 10 percent minimum participation is held over a twelve-month period. However, the participation exemption also applies if a participation is below the 10 percent threshold, but the underlying investment has an acquisition price of at least EUR 1.2 million and the participation was held for at least twelve months. Of the countries listed in Table 1, only the United Kingdom has a more generous provision.

Table 1. Participation Exemption Regimes in Selected European Countries

Country	Amount Exempt	Requirement for granting exemption
Luxembourg	100%	10% minimum participation or acquisition price of at least EUR 1.2 million; holding for at least 12 months
Netherlands	100%	5% minimum participation held by a Dutch corporation and subsidiary (1) not merely portfolio investment; (2) subject to reasonable effective tax rate; or (3) has less than 50% passive assets.
Belgium	100%	10% minimum participation or acquisition value of EUR 2.5 million; minimum holding period of 12 months; and subject to tax test.
France	95% of dividend (99% if in a tax group); 88% of capital gains	5% minimum participation and 2 years minimum holding period
Germany	95%	For dividends, 10% minimum participation for CIT; 15% for trade tax purposes
Ireland	100%	Dividend paid by Irish resident corporation (foreign dividends subject to 12.5% with credit for foreign tax); for capital gains, 5% minimum participation; subsidiary must be trading company or member of a "trading group"; and holding for at least 12 months in last 2 years.
United Kingdom	100%	For dividends, no minimum participation or ownership period; for capital gains, subsidiary must be trading company or member of a "trading group"; at least 10% of shares must have been held for at least 12 months in last 6 years.

Source: International Bureau for Fiscal Documentation (www.ibfd.com).

Withholding taxes (WHTs) on dividends, interest, and royalties are comparatively low in Luxembourg. These WHTs are often used by countries to tax passive income at source; or they serve as a safeguard against base-eroding payments by MNEs. According to its domestic tax law, Luxembourg levies a 15 percent WHT rate on dividend payments and imposes no WHT on interest and royalties. This is low compared to neighboring countries—although similar rates are found elsewhere (Table 2). However, while in the EU the Parent-Subsidiary Directive and the Interest-and-Royalty Directive eliminate WHTs on intra-EU payments of dividends, interest, and royalties, Luxembourg extends this benefit to payments to companies residing in a non-EU country if it has a tax treaty with Luxembourg and if certain conditions apply.⁵

Table 2. Withholding Tax Rates in Selected EU Countries (in Percent)¹

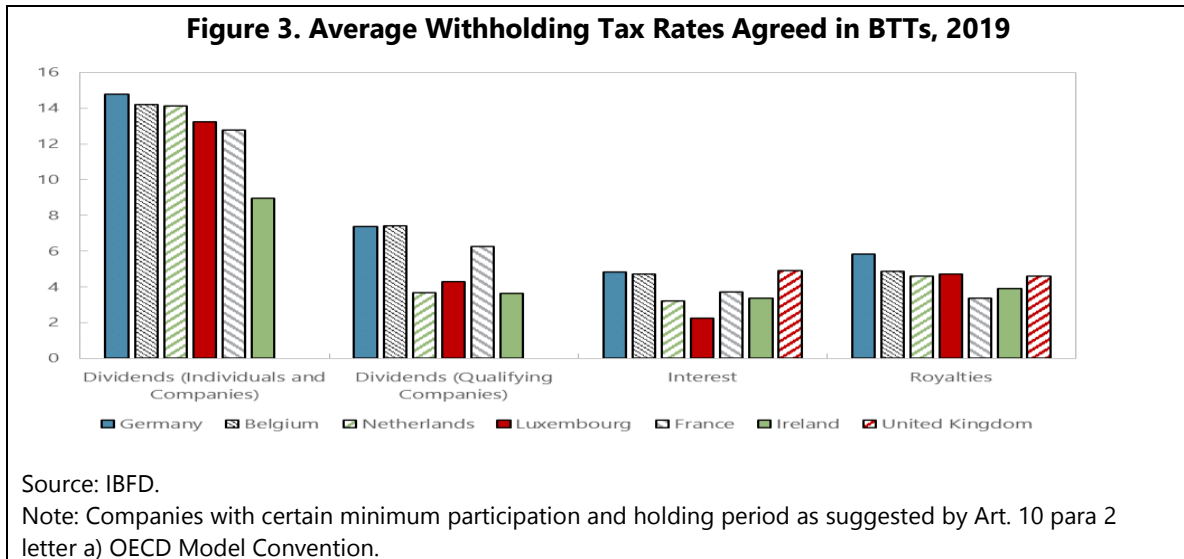
Country	Dividends	Interest	Royalties
Luxembourg	15%	0%	0%
Netherlands ²	15%	0%	0%
Belgium	30%	30%	30%, reduced by standard deduction of 15 percent
France	30%	0%	Standard CIT rate
Germany	Effective rate of 15.825% (incl. solidarity surcharge),	0% (26.375% for certain payments)	Effective rate of 15.825% (incl. solidarity surcharge)
United Kingdom ³	0%	20%	20%
Ireland	20%	20%	20% on patent royalty; 0% on other royalties

Source: IBFD.

Notes: ¹ WHT rates are reduced to 0% under the EU Parent Subsidiary Directive for intra-EU dividend payments and under the EU Interest and Royalty Directive for intra-EU interest and royalty payments. ² The Dutch government announced as from 2024 a withholding tax on interest and royalty payments of 25 percent to countries with a statutory CIT rate of less than 9 percent (low-tax jurisdictions).³ UK exited the EU on January 31, 2020.

Luxembourg's bilateral tax treaties often reduce WHT rates on incoming flows levied by other countries. Bilateral tax treaties (BTTs) typically lower the WHT rates specified in domestic law on a reciprocal basis, facilitating bilateral foreign direct investment (FDI). Luxembourg has 84 BTTs in which comparatively low WHT rates have been agreed by the contracting jurisdictions, notably on interest (Figure 3). This, together with the participation exemption (explained above), makes Luxembourg an attractive hub for pass-through financial investments, i.e. investment in financial assets that flow into and out of Luxembourg, with limited contribution to its economy.

⁵ A zero WHT rate for dividends applies if the recipient company: (i) is subject to a similar CIT regime as in Luxembourg with at least half of the Luxembourg CIT rate; (ii) holds a minimum participation of 10 percent or a minimum acquisition price of EUR 1.2 million; (iii) holds that participation for at least twelve months.



Luxembourg's advance ruling practice has changed in recent years and the number of advance pricing agreements (APAs) has drastically declined. This practice—aimed at providing tax certainty to MNEs—received ample criticism after the so-called LuxLeaks incident revealed in 2014, which exposed significant weaknesses in the issuance of confidential unilateral advance tax rulings and APAs to MNEs.⁶ In response to the incident, the Luxembourg government substantially changed the application process. Decisions on rulings are now taken by a special commission consisting of five tax officials. Also, a fee of between EUR 3,000 and EUR 10,000 (depending on complexity) is charged for filing a request for an APA. Luxembourg also implemented new transfer price guidelines according to BEPS Actions 8 to 10 (Art. 56bis of Luxembourg Income Tax Law) and participates in the automatic exchange of advance cross-border rulings and APAs in the EU. These changes seem to have had a major impact: the number of APAs in force dropped from 599 at the end of 2016 to only 14 at the end of 2018.⁷

Luxembourg has implemented several anti-tax avoidance rules and is compliant with the OECD minimum standards on Base Erosion and Profit Shifting (BEPS) and the EU's anti-tax avoidance directives (ATAD I and II). IMF (2018a and 2019a) provide a more systematic overview of these measures. In broad terms, Luxembourg introduced rules to limit excessive interest deductibility, put a tax on passive income earned in low-tax jurisdictions outside the EU, introduced an exit tax, imposed a general anti-abuse rule (GAAR), and included provisions to tackle hybrid mismatches (e.g. whereby a payment is characterized as deductible interest in one country and as exempt dividend in another country). In response to the new OECD guidelines following BEPS, Luxembourg also modified its transfer pricing rules, amended the domestic definition of a

⁶ Research by Hueseken and Overesch (2019) shows that, during 2000–2014, MNEs that were granted an advance tax ruling or APA in Luxembourg had an effective tax rates that was 4 percentage points lower compared to similar firms that had no such APA or ruling in force.

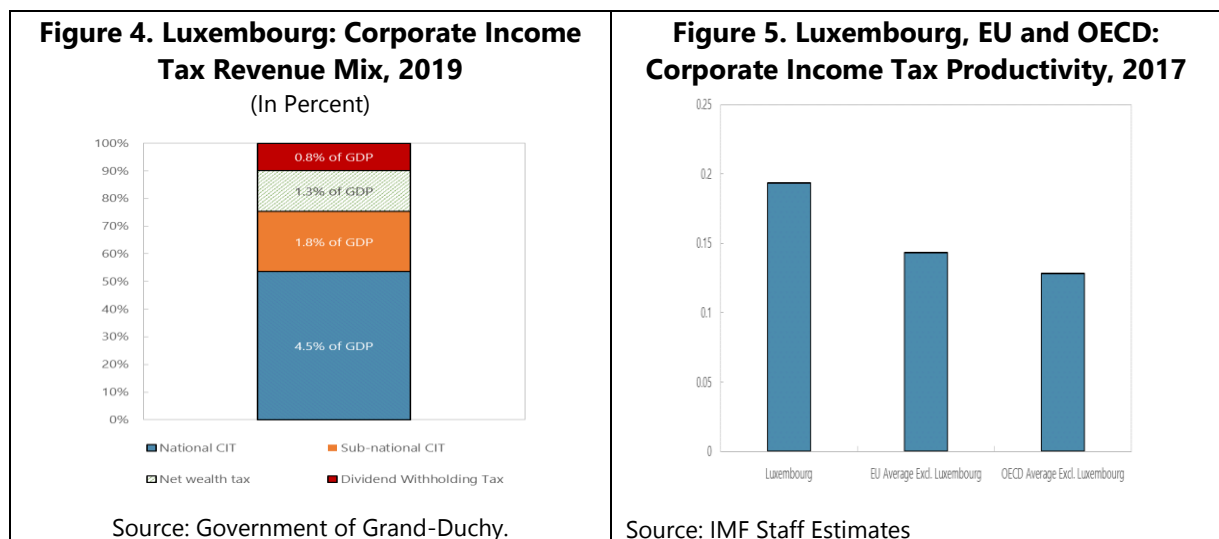
⁷ EU Joint Transfer Pricing Forum, Statistics on APAs in the EU (2018; 2019).

foreign permanent establishment, passed a law on country-by-country reporting, and has ratified updates in its BTTs, which were agreed in the multilateral instrument (e.g. provisions against treaty shopping). Although the material impact of this anti-tax avoidance package is difficult to estimate, it has presumably strengthened the robustness of the CIT base (see further below).

C. Revenue Performance

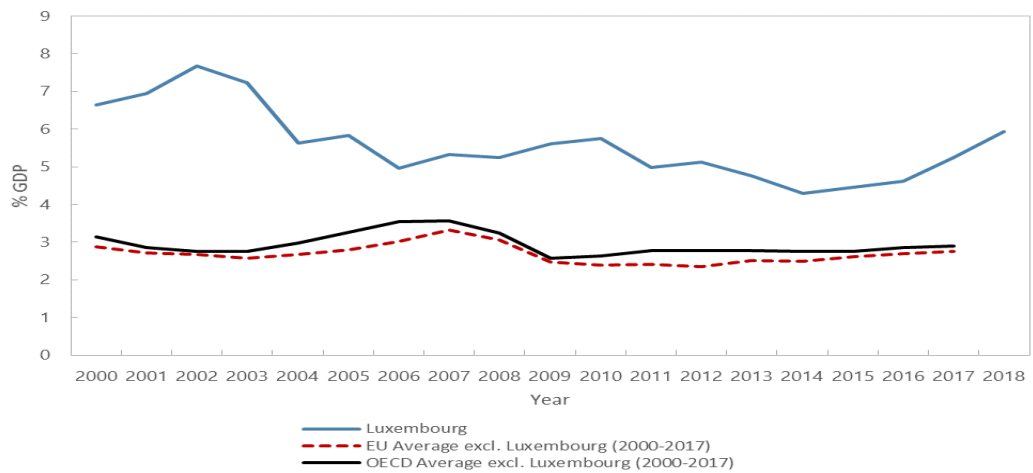
Revenue from Luxembourg’s CIT is relatively high, reflecting a broad tax base and a strong collection practice through electronic filing. In 2019, revenue from the national CIT (IRC), solidarity surcharge and subnational CIT (ICC) was EUR 3.9 billion (on a cash basis), which is 6.4 percent of GDP (Figure 4), or 23 percent of total tax revenue. Revenue productivity—CIT revenue as a percent of GDP divided by the CIT rate—is 0.19, which is higher than the average in the EU (0.14) and OECD (0.13) (Figure 5). The corporate tax-to-GDP ratio in Luxembourg is twice the average in the EU and OECD (Figure 6). In recent years, despite a gradual reduction in the CIT rate, corporate tax revenue has significantly increased, from 4.3 percent of GDP in 2014 to over 6 percent today. Part of this abundance is likely to be temporary due to a switch to mandatory electronic filing from tax year 2017 onward. It allows data for all corporate taxpayers to be processed quicker, enabling the tax administration to speed up the process of issuing an assessment. Data on quarterly tax receipts suggest indeed a significant uptick in collections in 2018Q4 and 2019Q1 after which it returns to the prior numbers (STATEC 2019).⁸

Two other corporate taxes yield a combined revenue equivalent to 2 percent of GDP. The corporate net wealth tax raised EUR 0.7 billion in 2018, which is 1.1 percent of GDP; and taxes on capital income (such as dividend withholding tax) brought in another EUR 0.5 billion (0.9 percent of GDP). Together with the CIT, the overall level of revenue from taxes on corporate businesses is thus almost 8 percent of GDP (Figure 4).



⁸ Note that the increased tax collection from assessed tax returns reflects profits from 2017 or earlier.

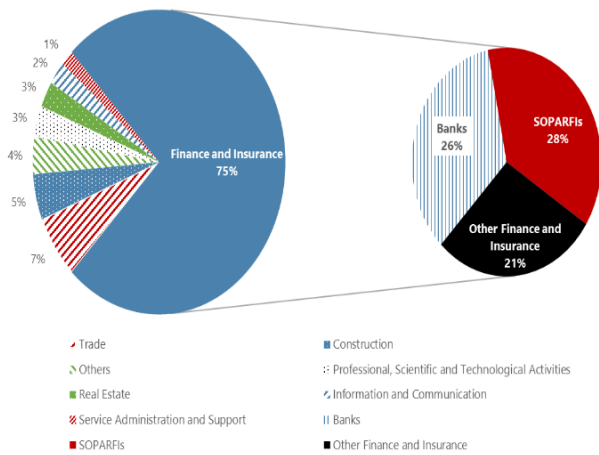
Figure 6. Luxembourg, EU and OECD: Corporate Income Tax Revenue, 2000-18
(In Percent of GDP)



Source: IMF Fiscal File for Luxembourg; IMF Internal WoRLD Database.

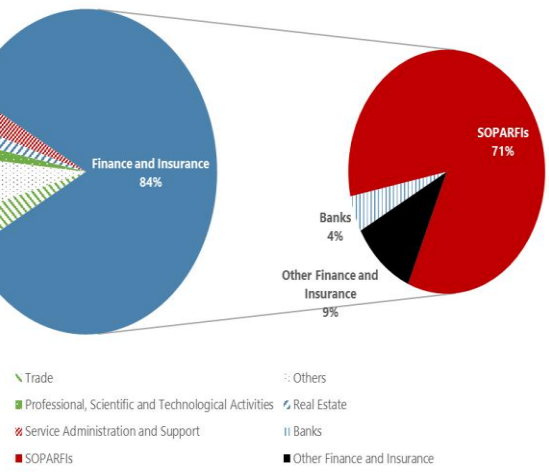
More than three quarters of business tax revenue comes from the financial sector, including SOPARFIs (*Société de participation financière*). National and subnational CIT payments in Luxembourg can be divided into four groups of firms each paying roughly one quarter: (i) banks; (ii) insurance and other financial institutions; (iii) SOPARFIs (see below); and (iv) non-financial companies (Figure 7a). In 2018, SOPARFIs generated more than 70 percent of the net wealth tax (Figure 7b) and approximately 50 percent of the dividend withholding tax. Overall, SOPARFIs paid approximately EUR 1.6 billion in tax, which is slightly over one third of the total business tax, or roughly 3 percent of GDP.

Figure 7a. Luxembourg: National and Sub-National CIT Revenue by Sector, 2018



Source: Government of Grand Duchy.

Figure 7b. Luxembourg: Wealth Tax (IF) Revenue by Sector, 2018



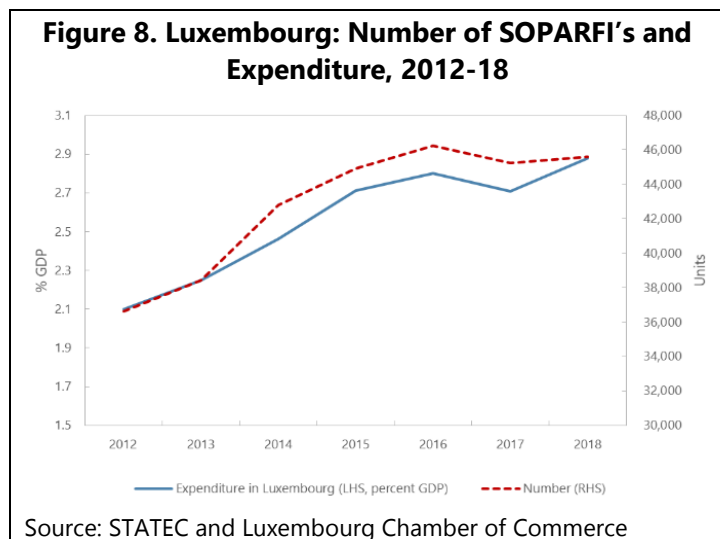
Source: Government of Grand Duchy.

D. Special Purpose Entities

Luxembourg hosts many special purpose entities (SPEs). Most captive financial institutions (code S.127) are classified as SPEs in the national statistical classification, which is currently being updated to be based on the IMF's Task Force definition of SPEs. It defines SPEs as legal entities with little or no physical presence (e.g. less than 5 employees), controlled by a non-resident, established to obtain specific advantages, and primarily transacting with non-residents (IMF 2018b). In Luxembourg, these entities are usually associated with SOPARFIs, a classification used by the tax administration and STATEC to refer to firms with similar (although not completely identical) characteristics.⁹ In 2019, there were 45,613

SOPARFIs registered in Luxembourg, a number that has grown steadily over the last decade by over a quarter (Figure 8). Table 3 compares SPEs in Luxembourg with those in the Netherlands another major investment hub where their role in 2016 was smaller in terms of number and balance sheet total, but larger in terms of income flows and taxes paid.¹⁰

SPEs are responsible for the lion share of the reported foreign direct investment (FDI) in and out of Luxembourg, which typically does not represent greenfield investment. Statistics of the Banque Centrale du Luxembourg (BCL) for 2019Q3 indicate that the stock of inbound FDI in Luxembourg is EUR 4.4 trillion, while the stock of outbound FDI is EUR 5.2 trillion. Global FDI statistics suggest that this makes Luxembourg the third largest global investor, after the United States (US) and the Netherlands (Figure 9a). More than 95 percent of



⁹ A SOPARFI is an ordinary commercial company that aims to hold participations and carry out related activities. It is subject to normal income tax. This paper uses the term SPEs to refer to both SOPARFIs (if information comes from STATEC or the tax administration) and captive financial institutions (if information comes from the Central Bank). For the Netherlands, information about SPEs is based on Central Bank data on captive financial institutions ("bijzondere financiële instellingen").

¹⁰ SEO (2018) uses the survey of the Dutch Central Bank to derive information about income flows by SPEs. For Luxembourg, we rely on aggregate information on income from FDI to infer this information. The Dutch survey also shows the source and destination countries of transactions by SPEs. It indicates, for example, that 6 percent of assets and 11 percent of liabilities are associated with low-tax jurisdictions (defined as countries with a CIT rate of less than 7 percent, or which are included in the EU list of non-cooperative jurisdictions). Similarly, 5 percent of total income derives from low-tax jurisdictions, while 21 percent of the payments flow to them.

these FDI stocks are associated with SPEs (Figure 9b). These typically represent pass-through financial investments, with relatively modest real implications for the Luxembourg economy.¹¹

Table 3. Characteristics of SPEs in Luxembourg (2018) and the Netherlands (2016)

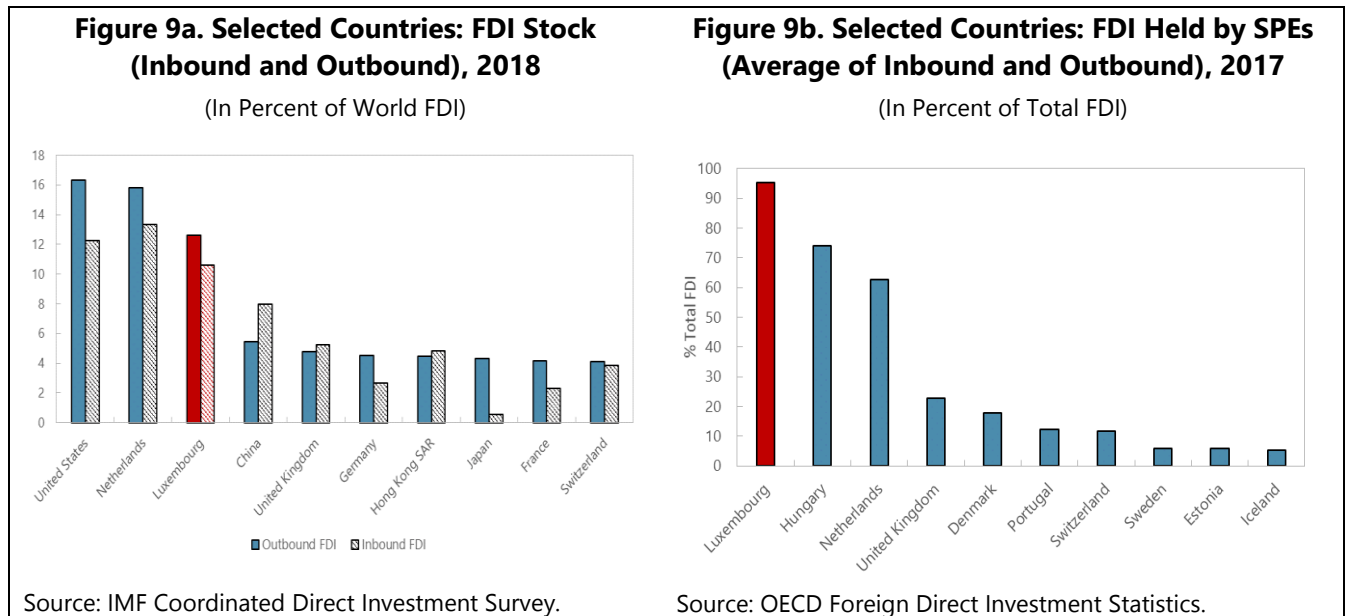
	Luxembourg (2018)	Netherlands (2016)
Number of SOPARFIs/SPEs	45,231	15,000
Number of SPEs covered in survey by Central Bank	2800 entities	950 entities
Balance sheet total	EUR 8,600 bln	EUR 4,400 bln
Share held by:		
- Holding companies	30%	39%
- Intragroup lending	60%	14%
- Other	10%	47%
Total assets/liabilities	EUR 8,600 bln	EUR 4,400 bln
Share of assets:		
- Intracompany loans	28%	31%
- Participating interest	72%	69%
Share of liabilities		
- Intracompany debt	39%	27%
- Equity	61%	73%
Total foreign income received by SPEs	EUR 85 bln ¹	EUR 196 bln
Share of:		
- Dividend	68%	65%
- Interest	30%	16%
- Royalties	2%	17%
Total payments made by SPEs to foreign jurisdictions	EUR 67 bln ¹	EUR 199 bln ²
Share of:		
- Dividend	54%	66%
- Interest	40%	8%
- Royalties	6%	16%
Contribution SPEs to the economy	EUR 0.5 bln salaries EUR 1.2 bln business services (4,465 direct jobs)	EUR 0.25-0.3 bln salaries EUR 0.4–0.7 bln business services (8,800 – 13,000 direct and indirect jobs)
	EUR 1.6 bln business tax revenue	EUR 2.3 bln business tax revenue

Sources: SEO (2013; 2018); Statec; BCL; Feuvrier (2019); and IMF staff calculations. Note: ¹ For Luxembourg, income received, and payments made are based on FDI income. Since SPEs account for 95 percent of FDI, this will be a close approximation of the flows through MNEs. FPI income and payments have been omitted due to data availability and relatively small share in the balance sheet. ² For the Netherlands, this includes the category "other payments", which is not reflected in the shares.

The large stock of foreign portfolio investment (FPI) adds to the balance sheet of SPEs and reflects Luxembourg's role as the domicile of a large number of investment funds. In 2019Q3, the

¹¹ This is an artefact of how FDI is measured (see e.g. Blanchard and Acalin 2016). There are now attempts by central banks and international organizations to clean FDI data for flows and stocks through SPEs to obtain an indicator that better reflects real investment (Damgaard and Elkjaer 2017).

stock of inbound FPI is EUR 5.4 trillion, while outbound FPI is EUR 4.3 trillion. These assets are managed by either traditional or alternative investment funds, such as hedge funds, private equity funds or real estate funds. Alternative investment funds often use SPEs in structuring their business, for instance to pool investments, pool equity with bank financing or hedge against risks by setting up an SPE for each investment compartment. One aspect in using SPEs may also be access to treaty benefits, which typically are not granted to investment funds directly.¹²



There can be several reasons for MNEs to choose their SPE location in Luxembourg. The survey by the BCL among 2,800 large SPEs reveals that in 2018, SPEs in Luxembourg had a total balance sheet of EUR 8.6 trillion (Table 3).¹³ Around 60 percent of these assets were held by SPEs that specialize in intragroup lending, while 30 percent were held by pure holding companies. Royalties are less important for Luxembourg, unlike, for example, in the Netherlands. The choice to locate in Luxembourg might have to do with both non-tax factors (such as easy access to its capital market or access to sophisticated financial services) or the tax environment. For instance, intra-group lending SPEs might domicile in Luxembourg due to the zero WHT on interest and/or because of the low WHT rates agreed in BTTs with other countries.¹⁴ Holding SPEs may find

¹² Note that FPI assets and liabilities represent only around 3 percent of foreign assets and 13 percent of foreign liabilities of SOPARFIs at the end of 2018 (Feuquier, 2019).

¹³ A description of the Survey is given in Duclos and Morhs (2017).

¹⁴ Intra-group financing vehicles have been subject to state aid investigations by the EC which found specific advantages in advanced rulings. In three cases (Amazon, Fiat-Chrysler, Engie), the European Commission decided that Luxembourg had provided inadmissible state aid. The cases are currently pending at European courts. An additional case (Huhtamäki) is under investigation.

Luxembourg attractive due to its relatively generous participation exemption and low or zero WHT rates on dividends (although they are subject to the net wealth tax).

SPEs spend almost 3 percent of GDP on salaries and purchases of business services and add 3 percent of GDP in business tax revenue. Data for approximately 42,000 SPEs suggest that they spent EUR 508 million (or 0.9 percent of GDP) on salaries in 2018 in Luxembourg, and approximately EUR 1.2 billion on audit, legal, and accounting fees (2.1 percent of GDP).¹⁵

This contribution has gradually increased over the last decade (Figure 8). Also, employment in SPEs has been growing strongly, from 690 jobs in 2005 to 4,465 in 2018 (Ministère de la Sécurité Sociale du Grand Duché de Luxembourg). The 3 percent of GDP in tax revenue from SPEs has also gradually risen over the last decade (Figure 10).

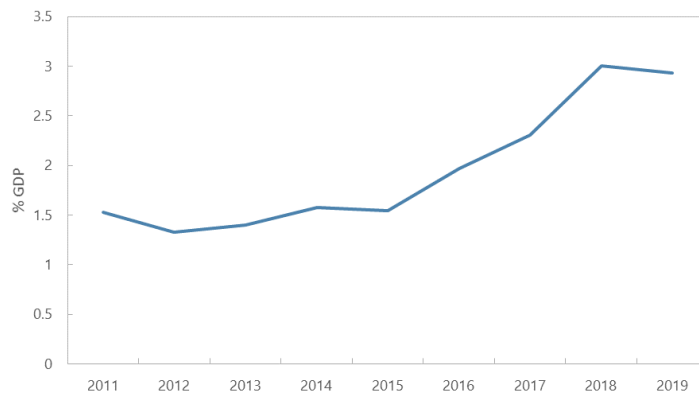
Together, the tax payments and domestic spending mean that SPEs add 5.9 percent of GDP to the Luxembourg economy.

Changes in international corporate taxation pose risks to the contribution of SPEs to Luxembourg's economy. Fundamental changes are currently being considered to address a wide range of international tax challenges, including tax avoidance, tax competition,¹⁶ the limited

taxing rights of market jurisdictions, and fundamental problems in pricing transactions between related parties. This might come at the expense of the activities and tax payments made by the SPE sector in Luxembourg, but at the benefit of other countries. For instance, payments currently flowing through SPEs might alternatively be paid directly to investors in other countries and

Figure 10. Tax Payments by SOPARFI's, 2011-2019

(In Percent of GDP)



Source: Luxembourg Conseil Economique et Social; Government of Grand-Duchy.

Note: Tax payments include national and sub-national corporate income tax, net wealth tax and dividend withholding tax.

¹⁵ Data provided by STATEC.

¹⁶ Appendix VI in IMF (2019b) discusses tax competition and notes that it is likely to impose a greater risk to CIT revenue than BEPS. Sometimes, tax competition is seen to be beneficial as it constrains governments in pursuing wasteful spending—but this view has become less common in light of the scarcity of public funds. Also, harmful tax competition is sometimes used to distinguish it from non-harmful. This concept has been operationalized by the OECD and the EU, with reference to preferential regimes to certain activities as being harmful. However, this fails to recognize that low or no effective taxation can be harmful for other countries. This paper therefore refers to tax competition in general as being a threat to revenue mobilization.

possibly be subject to (higher) WHT rates or a less generous participation exemption.¹⁷ The effects of these changes on the contribution of SPEs to the Luxembourg economy is discussed in the next section.

III. REFORMS IN THE INTERNATIONAL TAX SYSTEM

A. Recent Changes

The international tax system has gradually changed over the last few years, providing opportunities for enhanced revenue mobilization, but also posing notable risks to revenue and the economy. The changes include a revised guidance by the OECD, new Directives by the European Union (EU), and unilateral measures adopted by countries:

- *The OECD Base Erosion and Profit Shifting (BEPS) Project* aimed to close gaps in international tax rules by addressing 15 problematic areas. The final package, agreed in 2015, includes four ‘minimum standards’ (e.g. to address treaty shopping), amends core OECD guidance (e.g. on transfer pricing) and delineates preferred practices (e.g. on interest deductibility). To facilitate and support BEPS implementation, the OECD developed a multilateral instrument (MLI) that enables simultaneous change to multiple BTTs. Like many other countries, Luxembourg has been active to ensure BEPS-consistency of its rules and has signed and ratified the MLI. This can expand the tax base of non-SPEs by mitigating tax avoidance. It could also redirect international financial flows away from Luxembourg SPEs.
- *Two EU Anti-Tax Avoidance Directives (ATAD I and II)* make some of the BEPS outcomes, beyond the minimum standards, mandatory for EU member states (on interest deductibility, for instance) and include other measures (for example an exit tax). Per 2020, Luxembourg has legislation in place to comply with both ATAD directives. Again, this may strengthen the robustness of the CIT base of the non-SPE sector but can also affect SPEs. For example, restrictions to the deductibility of interest (in Luxembourg and elsewhere) or rules to prevent hybrid mismatches can affect intracompany financing activities and reduce income of SPEs in Luxembourg.
- *Unilateral measures by other countries* have started to reshape the international tax system in recent years. Tax competition in the EU is reflected in an ongoing decline in CIT rates. And the Tax Cuts and Jobs Act in the United States brought not only a large cut in the federal CIT rate (from 35 to 21 percent), but transformed its worldwide regime (with a credit for foreign tax paid, but allowing tax deferral until profit repatriation) into a territorial system (with an exemption for foreign dividends). The latter might have large effects on the stock of assets held by US-owned SPEs in Luxembourg, since MNEs will no longer have a tax incentive to pool and reinvest foreign earnings abroad. The US tax reform also introduced novel changes

¹⁷ Beer and Loerprick (2018) find, for example, that African countries that have signed BTTs with investment hubs, on average raise one quarter less in CIT revenue than countries that have not signed such BTTs.

in its international provisions (such as effective minimum taxes on outbound and inbound investment), which could affect Luxembourg SPEs and the FDI flowing into them.

While corporate tax revenues have grown strongly over recent years, tentative signs of change in Luxembourg's economy and its revenue mix are emerging—consistent with the expected responses of MNEs to the recent international tax changes:

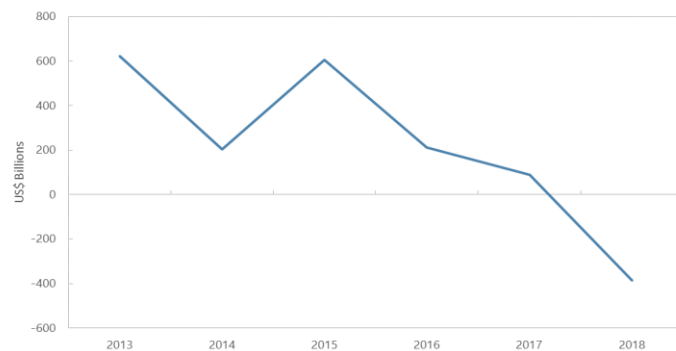
- *While FDI stocks remain elevated, we observe a relatively large negative gross FDI inflow of €400 billion in 2018 and 2019, against gross inflows of €200 to 600 billion over the past 5 years (Figure 11).*

This structural break seems partly attributable to the US tax reform and the adoption of anti-tax avoidance measures. The repatriation of dividends by US-owned MNEs in Luxembourg, for instance, increased fourfold from US\$ 6.5 billion in 2017 to US\$ 28.5 billion in 2018

(reflecting negative reinvestment of earnings, see BEA 2019). This direct repatriation is likely to be complemented by dividend repatriation that is channeled through one or more countries. For example, in 2018, US\$ 232 billion of capital was withdrawn from Luxembourg into the Netherlands. In the same year, US MNEs repatriated US\$ 139 billion of dividends from the Netherlands.¹⁸

Figure 11. Luxembourg: Gross FDI Inflow, 2013-2018

(In Billion US Dollars)



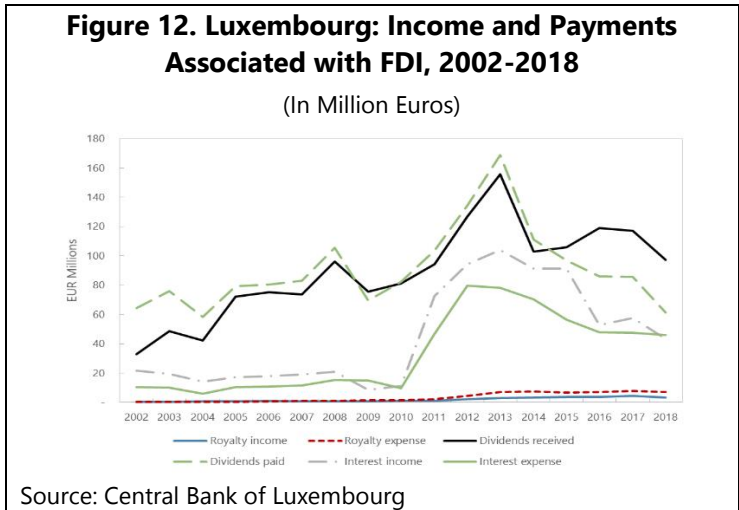
Source: OECD Foreign Direct Investment Statistics.

- *The number of SOPARFIs declined somewhat from 46,238 in 2016 to 45,613 in 2019, after a decade of increases (Figure 8). Consistent with this is the drop in the balance sheets of SPEs from EUR 9,6 trillion in 2016 to EUR 8,6 trillion in 2018, mainly due to a reduction of participating interests in pure holding companies (from EUR 3.4 to 2.7 trillion). Again, this could be explained by the US tax reform, which induced US-based companies to pay back dividends or restructure their finances: the share of US assets indeed dropped between 2016 and 2018 from 25 to 18 percent (Feuvrier 2019)¹⁹.*

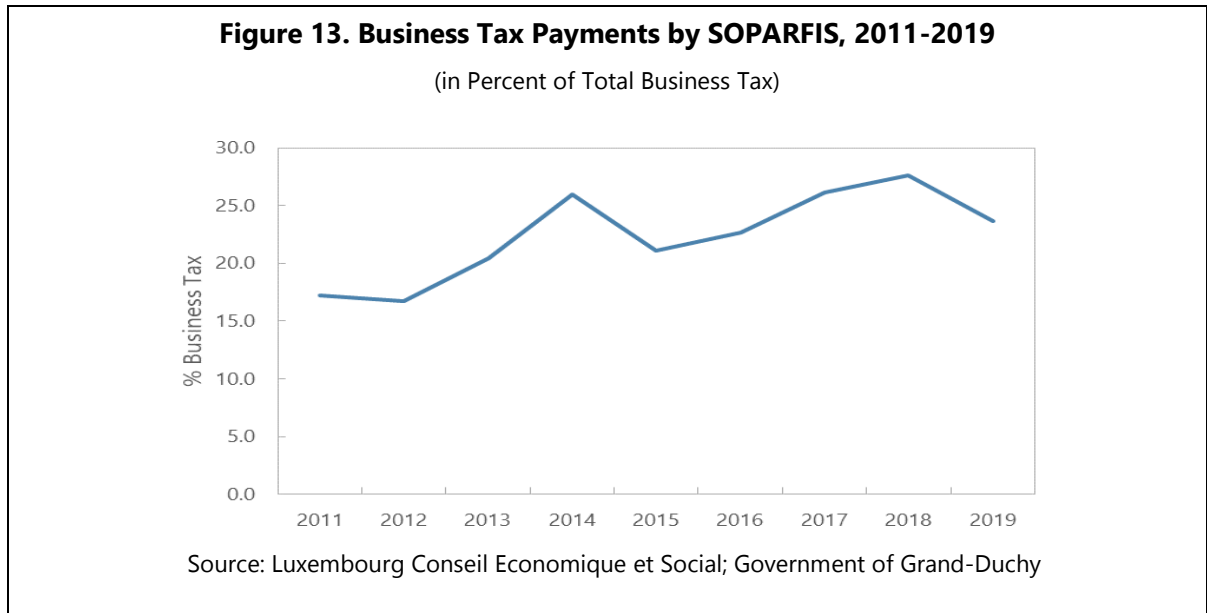
¹⁸ In addition, there was a significant outflow of almost US\$ 85 billion as repayment of intra-company debt.

¹⁹A BCL working paper, "A Typology of Captive Financial Institutions and Money Lenders (Sector S127) in Luxembourg" (Di Filippo and Pierret, 2020) which updates some of the data presented here has since been published, but does not change the main conclusions of our analysis.

- *Intragroup debt and interest payments declined.* The value of loans to foreign affiliates dropped from EUR 1.7 trillion in 2016 to 1.4 trillion in 2018 (Feuquier 2019). Balance of payment statistics suggest that interest income from abroad also dropped after a peak at 104 percent of GDP in 2013, to 53 percent of GDP in 2018 (Figure 12).



- *The composition of CIT payments is changing, away from SPEs and toward other companies.* The share of national and sub-national CIT revenue generated by SOPARFIs has stopped rising since 2018, and in fact declined somewhat in 2019 (Figure 13). This may reflect the impact of a global adoption of anti-tax avoidance measures, which strengthens the CIT base of non-SPEs but weakens it for SPEs.



B. Possible Future Changes

Debate about further and more fundamental changes in the international tax framework are ongoing. Two IMF Policy Papers (IMF 2014, 2019b) discuss broad directions for change in the international tax framework to address challenges associated with arm’s-length pricing, tax competition, digitalization and concerns of developing countries. In the OECD’s Inclusive

Framework, proposals are now being considered that modify the international tax framework along two pillars—with the aim to reach a consensus on them by mid-2021 (OECD 2020ab):

- **Pillar 1** addresses the tax challenges in the digital economy by providing a new “nexus” approach that goes beyond physical presence. A portion of the profit is attributed to market jurisdictions by using formulary methods, instead of arms-length pricing methods.
- **Pillar 2** explores the design of a minimum level of taxation of multinationals globally, both for in- and outbound investment, to address residual BEPS concerns and limit the impact of tax competition.

In the EU, debate is ongoing about the common consolidated corporate tax base (CCCTB), which would replace separate accounting entirely with formula apportionment. Under that system, accounts of all of a company’s affiliates in Europe are consolidated to generate a unitary tax base that is apportioned across countries on a formulaic basis, using weights of employment, payroll, assets and sales by destination.

This paper analyzes the possible revenue effects for Luxembourg of an international taxation regime that adheres to these themes under discussion. We explore, respectively, the direct revenue effects of formula apportionment, with a profit allocation based on either source or market factors; and we analyze the introduction of minimum taxes on either outbound or inbound investment. The estimates are partly based on country-by-country reports (CbCR), filed in Luxembourg for the tax year 2016 (Box 1).

Box 1. Luxembourg Country-by-Country Reports, 2016

Country-by-country reports (CbCR) for Luxembourg in 2016 provide data for 120 large MNEs headquartered in Luxembourg. It also provides data for 85 MNEs headquartered elsewhere but operating in Luxembourg—mostly Chinese MNEs that use Luxembourg as a sales hub. Our focus here is on the former data, however. The data has been aggregated for both the full sample of 120 MNEs and is separately provided for the 52 headquartered MNE groups that made a profit in 2016. The CbCR data also provide aggregate information for each host country. The data have been published, along with those of 25 other countries, in OECD (2020c).

Before describing the data, note that CbCR statistics have limitations that are important to keep in mind when interpreting and using them. For instance: (i) inclusion of intracompany dividends in profits can result in double counting and substantially lower effective tax rates (an issue also recently emphasized by Blouin and Robinson (2019) in other firm-level datasets); (ii) the treatment of stateless entities can lead to double counting if they are tax transparent, as both the stateless entity and the owner may report the profit; (iii) as CbCR reports represent an aggregation of separate accounts of each affiliate, revenue may be overstated due to related-party transactions; (iv) timing issues as CbCR data do not include deferred taxes or provisions for uncertain tax liabilities.

The 120 Luxembourg headquartered MNEs operate on average in 21 jurisdictions, mainly in the US, large EU countries, Brazil, Kazakhstan and Mexico. These MNEs:

- employ 1.5 million people around the world, of which 15,000 in Luxembourg (1 percent);
- own US\$210 billion in tangible assets, of which US\$ 25billion is located in Luxembourg (12 percent);

Box 1. Luxembourg Country-by-Country Reports, 2016 (Concluded)

- made US\$ 456 billion in sales to unrelated parties, of which US\$22 billion originated in Luxembourg (4.9 percent);

Foreign affiliates of the Luxembourg MNEs focus on sales, marketing and distribution (25 percent) or production activities (13 percent). In Luxembourg, the MNEs mainly have their holding companies and internal group finance operations (the main activity of 57 percent).

The 52 profit-making MNEs made a total profit of US\$ 8.2 billion in Luxembourg, compared to a profit in other jurisdictions of US\$ 34 billion. However, the CbCR data might overstate the taxable profits due to the double counting issue, as described above. This might be especially relevant for Luxembourg due to the importance of holding companies among the MNEs.

C. Formula Apportionment

The adoption of formulary apportionment (FA) will most likely cause a reduction in tax revenue in Luxembourg. A recent assessment by IMF staff exploits three datasets to assess the direct revenue effects of global FA for individual countries (De Mooij, Liu and Prihardini 2019). It finds that Luxembourg would lose around 70 percent of the tax currently paid by US-based MNEs, irrespective of the allocation formula used, including one based on sales by destination (reflecting an allocation of taxing rights to market jurisdictions).²⁰ The results are intuitively clear, as FA attributes the profits of a multinational to where the formula factors are—i.e. where physical production factors are located or where the sales take place—and not where e.g. interest margins are earned or IP income is booked. An important part of the tax base of Luxembourg SOPARFIs would therefore disappear under FA.

FA may also hurt investment and employment in Luxembourg. MNEs will have a stronger incentive to move whatever real factors are used in the allocation formula to countries with low CIT rates.²¹ Given the relatively high CIT rate in Luxembourg, such behavioral responses will most likely exacerbate the revenue losses and magnify the economic costs. An economic impact assessment of the CCCTB by the European Commission in 2016, which includes behavioral responses, indeed finds that Luxembourg would experience a large reduction in welfare of between 0.6 and 1 percent of GDP.

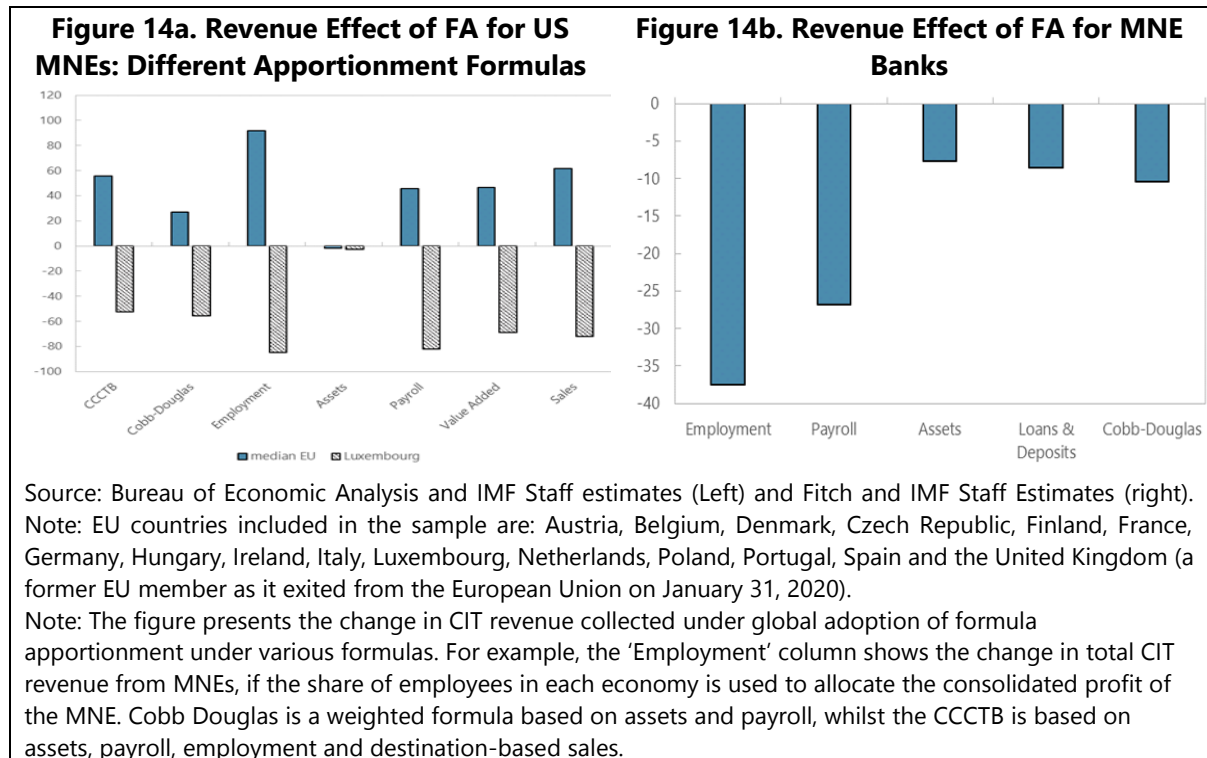
The financial sector would most likely receive special treatment under FA—which could mitigate but would unlikely undo the negative results for Luxembourg. The simulations above treat the financial sector like any other sector. However, experience with FA in Canada and the US suggest that distinct formulas are generally used for financial companies to better reflect the specific features of their business (e.g. in measuring assets or sales). Also in the CCCTB proposal by the

²⁰ Hebous, Klemm and Strausholm (2019) show that Luxembourg would lose substantial revenue under a destination-based cash-flow tax, which is consistent with these findings.

²¹ There is less scope to relocate under a formula based on sales by destination, compared with formulas based on physical factors.

EC, the formula for the financial sector is modified to include a portion of financial assets (instead of only fixed assets). To explore this, we provide new analysis using two datasets:

- Figure 14a builds on the analysis of De Mooij, Liu and Prihardini (2019) using BEA data for US-based MNE's. It adds 10 percent of financial assets to the asset-based formula. Doing so implies that a much greater portion of the profits of US MNEs would be attributed to Luxembourg. Indeed, while the revenue loss is 74 percent if financial assets are excluded (approximately 1 percent of GDP), the revenue loss declines to less than 3 percent if a portion of financial assets are included.²²



- Figure 14b is based on Fitch data for 18 multinational banks with a presence in Luxembourg.²³ In 2016, these banks generated a consolidated global profit of US\$96 billion, of which US\$653 million was reported in Luxembourg. They accrued US\$124 million in tax liability in Luxembourg (implying an effective tax rates of 18.9 percent), compared to a global tax of 5.4 billion (implying an average tax rate of 22 percent). Figure 14b shows that under a system of FA, Luxembourg would lose between 8 and 38 percent of the tax revenue from these banks. The revenue loss is largest for the employment factor, as the share of

²² This is consistent with the CbCR data presented in box 1, which indicate that Luxembourg has 10 percent of the global assets of MNEs but only 1 percent of their employment.

²³ We only include banks in our sample for which the unconsolidated accounts in the database cover at least 70 percent of global employment of the company group (as reported in the consolidated statement). This ensures that our data is sufficiently representative for the bank's operations.

employees from these banks is relatively small in Luxembourg. When the asset factor (which again, includes fixed assets plus 10 percent of financial assets) or a factor based on loans and deposits is used, the revenue loss for Luxembourg is less than 10 percent.²⁴

D. OECD's Unified Approach

Although important details still need to be agreed upon in the OECD's Inclusive Framework blueprint, reforms along the lines of the unified approach²⁵ will likely reduce revenue in Luxembourg.

The focus here is on the so-called "amount A" under the unified approach, which refers to a new taxing right for market jurisdictions by modifying the notion of physical presence. It attributes to these countries a portion of what is called 'residual profits', which is the share of the consolidated global profit of an MNE that exceeds a certain threshold level reflecting the so-called 'routine return'. A fixed share of the residual profit (Amount A) is then apportioned to market countries based on their share in third-party sales. To avoid double taxation, the new taxing right will be offset or 'surrendered' by adjusting taxable profit in either source or residence countries. To assess the impact of this reallocation of taxing rights, we use Luxembourg's CbCR data for profit-making MNEs that are headquartered in Luxembourg.

We first calculate the residual global profit of these MNEs as the surplus over either a 7.5 percent mark-up on third-party sales or a 10 percent return on fixed assets. The calculations suggest that residual profits are, respectively 33 and 65 percent of total profits.²⁶ If we assume that 20 percent of those excess profits will be reallocated under the new taxing right, this would apply to between 6.6 and 13 percent of global MNE profits (US\$ 2.8 – 5.6 billion).²⁷ In the absence of data on sales by destination, we use sales by origin to allocate these profits across countries. In that case, Luxembourg would receive a share of 2.2 percent of the residual. At the same time, however, Luxembourg would surrender a portion of the current tax base as part of the reallocation of taxing rights. If this share is proportional to Luxembourg's share in global reported profit of MNEs, this would be 19.2 percent.

On balance, Luxembourg would thus lose 17 percentage points of its tax base related to the residual profits (Amount A), which is equivalent to 12 percent of Luxembourg's current tax base.

²⁴ The banks included in our sample are relatively small. To check the robustness of the findings here, we did the same analysis for the EU's largest banks with data obtained from country by country reports by Transparency International EU (<http://taxtracker.eu/>). The results indicate that Luxembourg would lose 83 percent of its revenue from large EU banks under an employment formula (which is the only factor on which information is available).

²⁵ See OECD (2020bc).

²⁶ See Box 1 for information on the total sales of these companies.

²⁷ We abstract from other limitations in the scope of the unified approach, such as the exclusion of certain sectors (like extractive industries or banks) or the focus on consumer-facing businesses. These would further reduce the size of the excess profits that is subject to reallocation.

Hence, as an upper bound the revenue loss would be between 5.8 and 11.5 percent of total current tax collections from large MNEs (US\$ 7-13 million)²⁸. The revenue loss would be greater, between 10 and 14 percent of current tax collections, if the portion of tax base surrendered by Luxembourg is proportional to its share of residual profit (32 percent based on mark up, or 22 percent based on fixed assets).

E. Minimum Taxes

A global minimum tax would have ambiguous revenue implications for Luxembourg, as direct revenue gains might be offset against indirect effects due to behavioral responses of MNEs and low-tax jurisdictions. The focus is on two components of a global minimum tax, details of which are still under discussion in the OECD Inclusive Framework: one on outbound and one on inbound investment:

- *A minimum tax on outbound foreign investment*, reminiscent of the global intangible low-tax income (GILTI) provision in the US, would allow Luxembourg to tax resident MNEs on their foreign-earned income if that is taxed less than some minimum rate. The CbCR data described in Box 1 provides information on MNE profits by the effective tax rate of the MNE sub-group, for each parent jurisdiction (Figure 15).²⁹ For the analysis of the minimum tax, we focus on the share of profits earned in countries where the effective tax rate of the MNE sub-group is reported to be below 10 percent. This share of profits exceeds 60 percent—similar to what is observed for, for instance, Austria, Belgium, Canada, Finland, Ireland, Poland, and Sweden. Using this data, the upper bound³⁰ potential base for the minimum tax is estimated at US\$16 billion (almost twice the current profit of these MNEs in Luxembourg). If Luxembourg could levy a tax equal to the difference between the minimum tax rate (of say 10 percent) and the average tax applied to these foreign profits abroad, for each percentage point of minimum tax it could raise revenue of US\$ 160 million, i.e. even more than all profit-making MNEs currently pay in Luxembourg (which is US\$ 116 million). If the minimum tax were to be based on a global blending approach (under which low-taxed profits could be offset against high-taxed profits reported elsewhere), revenue is estimated to be one-third

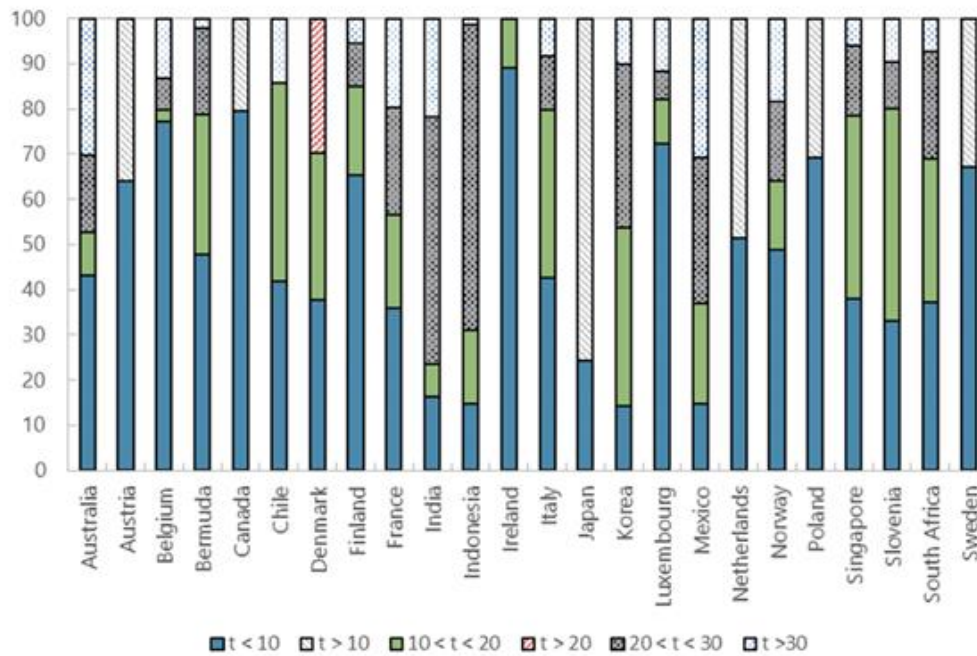
²⁸ This estimate is an upper bound because it includes MNEs from all sectors. In practice, Amount A will only apply to MNEs which provide automated digital services or those that are consumer-facing businesses.

²⁹ These effective tax rates are reported in the CbCR data and refer to investments made in the parent jurisdiction and other jurisdictions. They may be underestimated if the measure of profits used overstates taxable income (e.g. by including intra-group dividends which are exempt from tax or income of transparent entities, such as investment funds which should be allocated elsewhere).

³⁰ This is the upper bound estimate because a substance carve out, based on the size of tangible assets and payroll located in low-tax jurisdictions, will be applied. It may also be reduced if the scope of the minimum tax will be limited, for instance by exempting specific items such as intra-group dividends and certain capital gains from the minimum tax base.

smaller.³¹ These positive direct revenue effects of a minimum tax might be undone, however, if low-tax jurisdictions and MNEs change their policies in response to the minimum tax. For instance, low-tax jurisdictions will have a strong incentive to raise their effective tax rate to at least the global minimum rate—as this would transfer the revenue to them instead of the residence country, while leaving the tax burden on the MNE unchanged. Such response would nullify the revenue gain in Luxembourg. Moreover, if MNEs become less inclined to minimize their foreign tax bill through channeling income via SPEs, tax revenue in Luxembourg can even fall.

Figure 15. Profits by effective tax rate of MNE sub-group, for each parent jurisdiction



Source: OECD (2020c) and staff calculations

- A *minimum tax on inbound foreign investment*, reminiscent of the base erosion and anti-abuse tax (BEAT) in the US, can take the form of denial of certain deductible payments made by Luxembourg affiliates of foreign MNEs (such as intracompany interest or royalties); or it could similarly be implemented by imposing WHTs on such payments. Such a minimum tax can be made conditional on the tax rate applied in the receiving country being below some minimum level. The direct revenue effects for Luxembourg can be substantial, given the importance of intracompany lending vehicles. For example, data from the BCL suggest that approximately 60 percent of all foreign debt in Luxembourg is held by countries with a CIT

³¹ We cannot use the CbCR data to explore global blending as only aggregate information is available. Therefore, we use ORBIS data to assess the difference between a country-by-country minimum tax and a minimum tax based on global blending. For 121 MNEs headquartered in Luxembourg and a minimum tax rate of 10 percent, we find a revenue effect of US\$ 31 million under country-level blending and US\$ 20 million under global blending, i.e. the revenue effect is reduced by one third.

rate that is below 10 percent.³² Imposing a minimum tax on the associated interest payments could yield large sums of revenue if nothing else would change. However, indirect effects are very likely to occur as interest payments are currently channeled through Luxembourg SOPARFIs precisely because of the low WHT rates. Removing this tax advantage by denying deductions could even remove intracompany lending activities in Luxembourg and cause adverse revenue effects. To give an idea of the magnitude of this effect: net foreign interest income in Luxembourg according to the balance of payments statistics is around 4 percent of GDP, of which we assume 60 percent comes from low-tax jurisdictions. If this income would be taxed at 25 percent, revenue at risk would be around 0.6 percent of GDP.

IV. POTENTIAL REFORM DIRECTIONS

If structural revenue from business taxation in Luxembourg were to fall in the future in response to international tax reforms, how could the government best respond? What options are most promising (or least harmful) for economic growth? We discuss here four reform directions: (i) business tax reform; (ii) environmental taxes; (iii) property tax; and (iv) personal tax reform. Notably, these are robust reform options regardless of the final revenue effects of changes to international taxation, and several of these options have been previously recommended to Luxembourg.

A. Business Tax Reform

Luxembourg has few options to strengthen business tax revenue through domestic reforms. The CIT rate is already relatively high, and pressures on the rate are likely to be downward in the future due to continued tax competition (although agreement on a global minimum tax would mitigate such pressures). The design of the CIT base is not particularly narrow and base broadening measures (such as changing the rules for tax depreciation or loss offset) run the risk of increasing the METR and hurting incentives for real investment. One option for base broadening that can be considered is reform of the recently introduced IP box. This instrument is generally not the most cost-effective in stimulating innovation and could better be replaced by instruments that directly reduce the cost of R&D, such as R&D tax credits (IMF 2016a). The revenue effect of such a reform will be modest.

Reform of the corporate net wealth tax can help remove severe inefficiencies but comes at a cost to revenue. The net corporate wealth tax imposes relatively large disincentives to investment and magnifies the tax bias toward corporate debt finance. In fact, the net wealth tax is opposite from an allowance for corporate equity, which IMF staff has frequently advocated to eliminate marginal investment distortions and remove debt bias (see e.g. IMF 2016b). Moreover, the net wealth tax is levied independent of profit and can be problematic for small loss-making companies that face cash constraints. Repeal of the net wealth tax has therefore economic appeal as it could stimulate economic growth, enhance corporate resilience and reduce

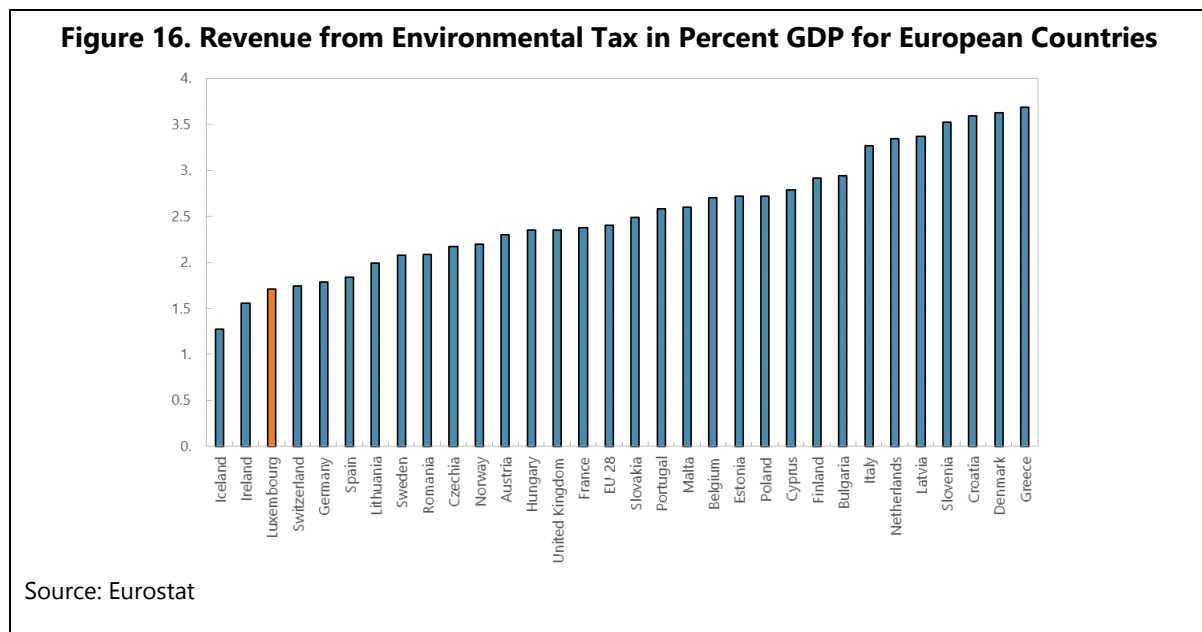
³² Bermuda, Cayman Islands, British Virgin Islands, The Bahamas, Jersey, United Arab Emirates, Qatar and Guernsey.

corporate indebtedness. However, the net wealth tax currently raises 1.2 percent of GDP in revenue. To mitigate this revenue loss in the short run, one option would be to maintain in some form the minimum asset tax on SOPARFIs, perhaps by transforming it into a registration fee. Indeed, a fee of EUR 4,815 levied on each of the 45,000 SOPARFIs would generate EUR 220 million, approximately 0.4 percent of GDP.

Luxembourg could also consider introducing a financial activities tax, proposed in IMF (2010). This would levy tax on the sum of financial institutions' profits and remuneration—which is its value added—to offset distortions caused by the exemption of financial services from VAT; alternatively, it could only target the economic profit of financial institutions. Keen, Krelve and Norregaard (2010) find that, with a share of the financial sector value added in GDP of 26 percent in Luxembourg (data for 2006), revenue of such a financial activities tax could be sizable—e.g. even a 4 percent tax rate could raise 1 percent of GDP. If the same tax would only apply to economic profits of financial institutions, it could still generate 0.6 percent of GDP.

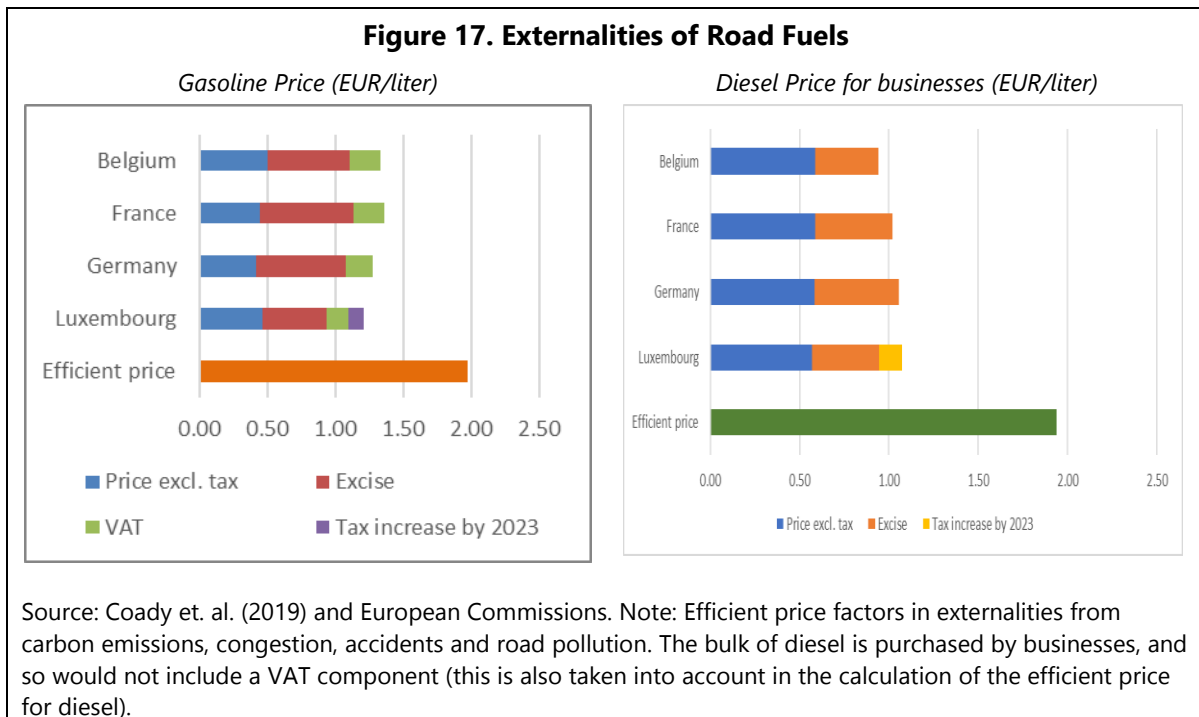
B. Environmental Tax Reform

Environmental taxes could be an attractive alternative revenue source for Luxembourg. Environmental levies are generally efficient instruments to address pollution externalities by correcting prices and steering the behavior of firms and people in a direction that is socially desirable. However, environmental taxes in Luxembourg currently yield one of the lowest revenues in the EU (Figure 16).



Environmental taxes can also help achieve Luxembourg's climate change commitments. Luxembourg is targeting an ambitious CO₂ emissions reduction of 55 percent below 2005 levels for sectors not covered by the EU emission trading scheme (ETS). This is in line with the new EU target of reducing EU greenhouse emissions by at least 55 percent. Under this proposal,

emissions targets would be lifted to 50 percent below 1990 levels by 2030 and hence would imply a more stringent emissions reduction in both the ETS sectors (power and heat generation, heavy industry and aviation) and non-ETS sectors. The majority of Luxembourg's emissions come from the non-ETS sector. Of the 10.3 MtCO₂e³³ emissions in 2015, road fuel sales to non-residents account for 39 percent, fuel use for the national road fleet contributes 17 percent, followed by manufacturing at 16 percent. Luxembourg relies on imports of electricity; hence the power sector contributes only a small amount to emissions allocated to Luxembourg.³⁴



A key policy measure to achieve the emissions reduction is a carbon tax. Starting in 2021, the government intends to introduce a carbon tax of EUR 20/tCO₂e for the non-ETS sectors and then to gradually raise it to EUR 30/tCO₂e. According to the authorities, the tax is expected to raise around 0.25 percent of GDP in revenue in 2021.³⁵ Furthermore the carbon tax will increase the tax on gasoline and diesel by just over 10 eurocents by 2023 (Figure 16). This goes part of the way towards capturing the negative externalities associated with fuel use, although fully capturing them would require consumer prices of around EUR 2 per liter (Coady et. al. 2019). The tax increase needed to achieve the target reduction in emissions from road transportation, depends on whether there is coordinated action in neighboring countries. A higher price increase would be necessary for Luxembourg to achieve its target if policies would be coordinated in Europe

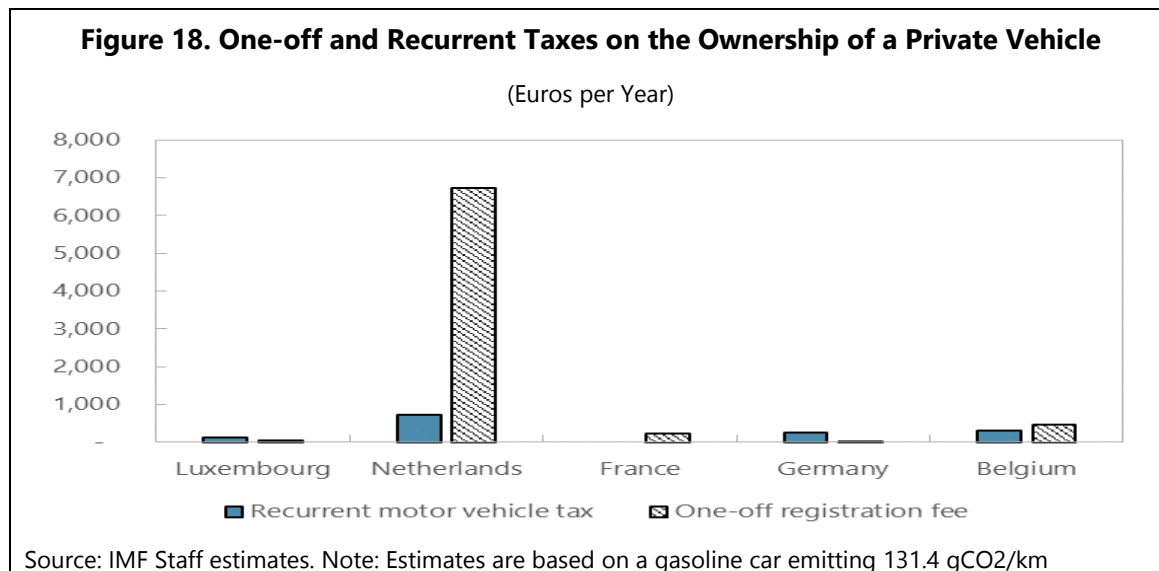
³³ Million metric tonnes of CO₂ equivalent

³⁴ Emissions are allocated to the place of production in the case of electricity and the place of purchase for fuels such as diesel and gasoline.

³⁵ An excise tax increase is scheduled in 2020.

(which in itself would imply lower overall emissions in the EU, but less would be ascribed to Luxembourg).

Road user pricing can help reduce congestion by increasing the cost of using private vehicles to travel through selected zones at peak times. Congestion charges allow the price of vehicle use to reflect both private costs and public externalities. These types of charges have been successfully implemented in cities such as London, Singapore and Stockholm. The charges range from a flat US\$ 15 per day in London, to around US\$ 4 per passage during peak times in Singapore and Stockholm. In these three cities, the annual net revenue from road-user pricing ranges from US\$ 100 million to US\$ 182 million, with a reduction in traffic through the zone by around 20 percent.³⁶ While road user pricing will not raise as much revenue in Luxembourg due to the lower volume of traffic, it may help reduce the currently high levels of congestion; a Luxembourg driver spends 37 hours in congestion annually, the fourth longest time in the EU.³⁷ Implementing congestion charging is likely to be more challenging in Luxembourg compared to other cities due to the high number of foreign registered vehicles. In London, local authorities work with a European company specializing in the collection of unpaid traffic fees from such vehicles to improve collection rates.³⁸



Higher registration fees and recurrent motor vehicle taxes can further support revenue mobilization while also helping to meet climate mitigation goals. The annual motor vehicle tax in

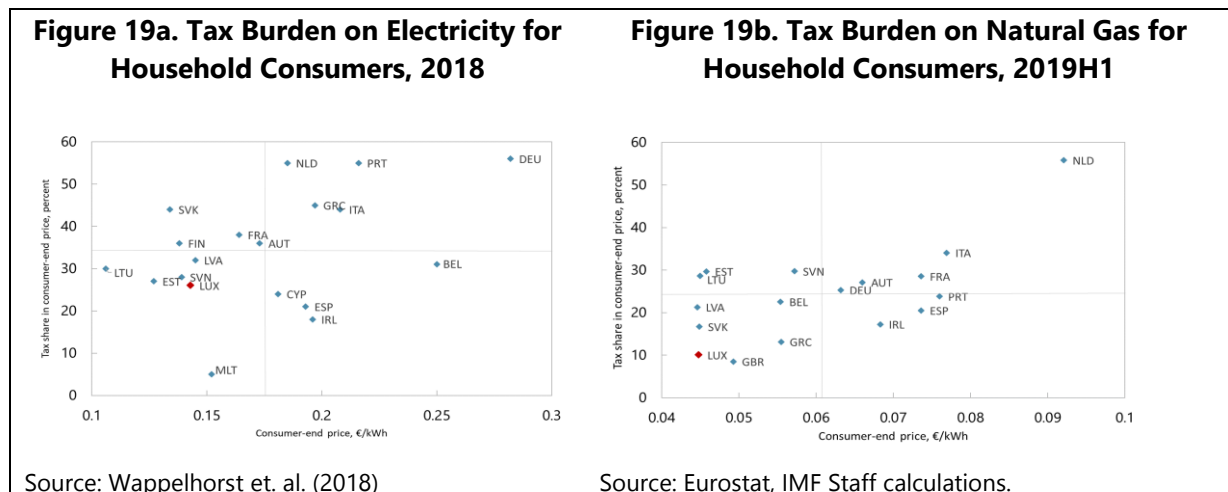
³⁶ Road User Pricing in London, Stockholm and Singapore, Tri-State Transportation Campaign (2018).

³⁷ European Commission Joint Research Center and Tom Tom (2017), https://ec.europa.eu/transport/facts-fundings/scoreboard/compare/energy-union-innovation/road-congestion_en#2017 (accessed 20 December 2019)

³⁸ London issued 14,612 congestion charge fines to foreign registered vehicles between August 2017 and July 2018. Of these, 41 percent have been paid by September 2018 (Transport for London).

Luxembourg is relatively low, at EUR 118 per year for a typical passenger car (Figure 18). For example, Germany levies an annual tax of EUR 246 on the same car. In addition, while 20 countries in Europe have a one-off registration tax that is linked to CO₂ emissions, Luxembourg has a flat registration fee of only 50 euros. The low level of taxation of private vehicles may have contributed to higher CO₂ emissions for newly registered cars (131.4 gCO₂/km in Luxembourg compared to a European average of 120.6 gCO₂/km) and explain a relatively high rate of vehicle ownership. Changing the recurrent motor vehicle tax to lower the threshold at which penalty rates kick in from 90gCO₂/km to 50gCO₂/km, as well as increasing the penalty from 0.1 to 0.2 euros, can lead to an additional 0.1 percent of GDP in revenue, even after allowing for a reduction in the average emissions of the fleet.³⁹

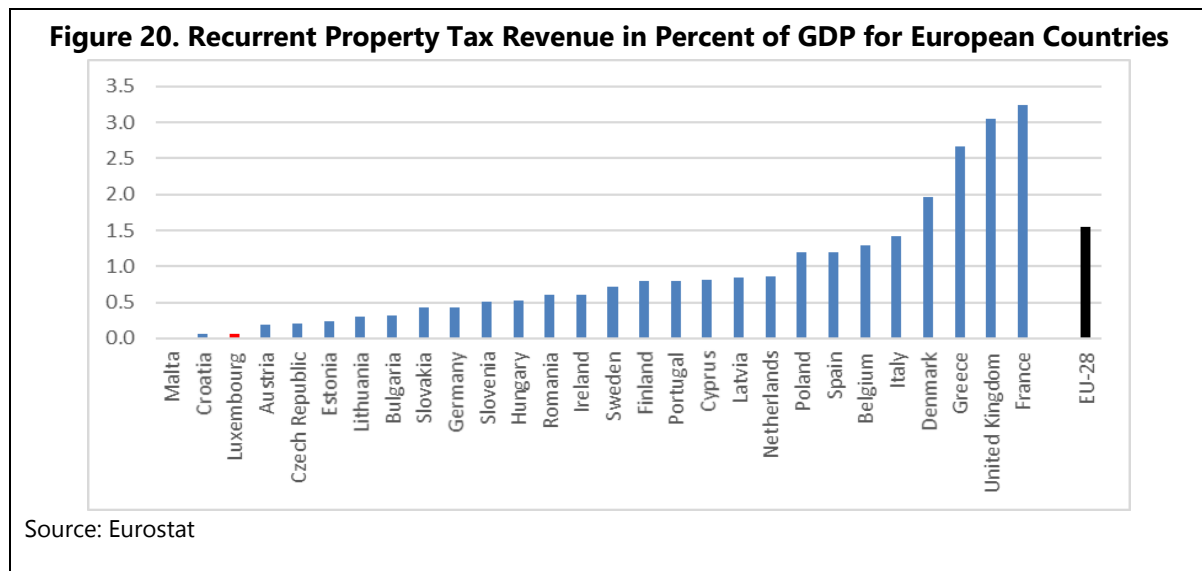
Removing the reduced VAT rates on fuel products (such as electricity, natural gas and heating gas oil)—while protecting the most vulnerable—would help reach Luxembourg’s energy efficiency target of a 44 percent reduction in final energy demand relative to baseline in 2030. Excise rates for these products, like road fuels, should be set at a level which captures negative externalities, including their carbon emissions (if this has not already been captured through a carbon tax). Preferential VAT rates are an inefficient method of protecting vulnerable households, since they are also enjoyed by high-income households. Targeted cash transfers to low-income households are a better way of protecting the vulnerable. Electricity and natural gas are taxed at a reduced VAT rate of 8 percent compared to the standard rate of 17 percent, contributing to a relatively low effective tax rate (Figures 18a and 18b). Similarly, the VAT rate for heating gas oil is 14 percent. Luxembourg has developed an energy efficiency action plan centered around regulatory standards and targeted incentives. The additional pricing signal would encourage the uptake of, for example, energy efficient appliances. The long-term revenue effects of removing the preferential VAT treatment for electricity, natural gas and heating gas oil is expected to be 0.1 percent of GDP.



³⁹ The current motor vehicle tax is calculated based on the formula $a \times b \times c$, where: a is the emissions of the vehicle; b is 1.5 if the vehicle is diesel or 1 if the vehicle is anything other than diesel; and c is 0.5 when the emissions do not exceed 90gCO₂/km and is incremented by 0.10 for each additional 10g of CO₂/km.

C. Housing Tax Reform

Another promising untapped revenue source in Luxembourg is the recurrent real property tax. This tax is relatively efficient as it is hard to escape due to its immobile base. Empirical studies find that recurrent property taxes indeed are the least distortive to economic growth among the major taxes. Recurrent property taxes are also generally perceived as fair, as they closely resemble a benefit tax, i.e. they represent a price for local public services. Luxembourg's property tax revenue is among the lowest in the EU at less than 0.1 percent of GDP (Figure 19). Its main weakness is that the underlying valuation of immovable properties is based on an old valuation regime from 1941. Property taxes are thus a small fraction of current market values.



The challenge is for Luxembourg to implement higher property taxes, but without reducing housing supply. Luxembourg faced a surging demand for housing over the last few years. Housing supply has not kept up with this growing demand, due in part to regulations that limit the use of available land for housing construction. Yet, it is also due to the practice of land hoarding whereby constructible land is kept undeveloped to capitalize on continuing price increases. Land available for housing construction is mainly in private ownership and 33 percent of such land are plots enclosed in urbanized areas that are already serviced and available for immediate development (OECD 2019). As encouraged by the Law of 17 April 2018 on spatial planning, some municipalities have allocated previously unallocated land to residential areas, as required by new spatial planning rules. However, this has not resulted in a significant increase of housing supply. The increasing gap between housing demand and supply has pushed house prices upward and decreased affordability. The challenge is to design a property tax reform that not only brings in more revenue, but that would also support housing supply (or at least would not reduce it).

Taxes on unused land and unoccupied dwellings could stimulate construction and housing occupation and reduce the pressures on housing prices. The 2008 Housing Pact already provides

municipalities with the possibility to levy an annual specific tax on unused constructible land and unoccupied housing. However, only 8 out of 102 municipalities have chosen to introduce such a levy. Indeed, communities who represent the interest of current owners seem to have little incentive to impose measures that boost housing supply and reduce house prices. Therefore, to encourage municipalities to utilize this tax more, the national government could step in. For instance, it could impose a requirement for municipalities to use this tax as a precondition for receiving grants—as was recommended by Conseil Economique et Social in 2018. Alternatively, the central government could levy an additional, gradually increasing tax on unused land and unoccupied dwellings.⁴⁰

D. Personal Income Tax Reform

Luxembourg's personal income tax (PIT) currently follows a traditional family-based taxation model with income splitting. It means that, for married couples and registered domestic partnerships, incomes of both partners are first aggregated and then split in two equal halves that are taxed at the prevailing progressive rate structure. This joint filing has the attraction that it is neutral with respect to the choices made within the household, as the tax due for the family does not depend on which partner generates the income. However, the income split model has the disadvantage of distorting the choice of cohabitation. For instance, if the incomes of two partners vary (perhaps being zero for one of them) they could significantly reduce their joint tax liability by marrying and filing jointly (a 'marriage bonus'). In Europe, family-based tax splitting systems are used in e.g. Germany and Portugal (Table 4). France uses a family-based tax system based on family quotients to determine the joint tax liability.

Taking individual income as the base for the PIT is more gender neutral and less distortive for labor supply of women. In a progressive tax system, income splitting reduces the marginal tax rate of the primary earner (the partner with the highest income) and increases it for the secondary earner (the partner with the lowest income). Since the latter are often women, family-based tax systems are typically not gender neutral but instead disadvantage women by imposing a higher marginal tax burden on their income. Moreover, as the elasticity of labor supply is generally found to be considerably higher for women than for men (see e.g. Evers et al. 2008), family-based tax systems also discourage overall labor supply. Many countries have therefore transformed their PIT into an individualized system. Following initial reforms in the 1970s and 1980s in Scandinavia, Austria, the Netherlands and in 1990 in the UK, individualized PIT systems are now in place in most European countries. Some countries with predominantly individualized systems have maintained elements of family-based taxation, such as a transferable tax deduction from the non-working spouse to the breadwinner, family-based deductions, dependent spouse deductions, or options for joint filing (Table 4).

⁴⁰ Such tax has been successfully implemented in Seoul, where land parcels left vacant for two years are subject to a 5 percent property tax, instead of the normal 2 percent; a 7 and 8 percent tax applies for land left vacant for three and five years. See www.urban-regeneration.worldbank.org/node/38

Table 4. Personal Income Tax Systems in Selected European Countries

	Tax Unit	Family deduction/credit	Dependent spouse deduction/credit	Transferable deduction/credit
Austria	Individual		x	
Belgium	Individual (partial split)			
Denmark	Individual			x
Finland	Individual			
France	Family			
Germany	Family (individual option)			
Ireland	Family (individual option)			
Italy	Individual	x	x	
Luxembourg	Family (individual option)			
Netherlands	Individual	x	x	x
Portugal	Family			
Spain	Individual (family option)			
Sweden	Individual			
United Kingdom	Individual	x		x

Source: Kalyva et al (2018).

Transition to an individualized income tax system can be smoothed by family-based allowances or tax credits, which could be gradually phased out. Since 2018, Luxembourg allows couples to voluntarily opt for individual taxation, with deductions then being equally split between partners. However, since this option is almost never beneficial compared to income splitting, very few households opt for it and family taxation remains the dominant model. While transition to an individual PIT system would increase the average tax burden on married or registered couples in Luxembourg, these effects could be mitigated by family-based deductions or allowances over the first years. For instance, when the United Kingdom introduced individual taxation, it was combined with a new tax allowance for married couples, which was phased out over a period of ten years.

Empirical studies confirm positive effects of individualization on female labor-force participation. Ex-post micro-econometric evaluations offer convincing evidence for positive employment effects from individualizing the PIT. These studies have been conducted, for instance, for the Czech Republic, Canada, Sweden and the US (see, respectively, Kaliskova, 2014; Crossley and Sung-Hee, 2007; Selin, 2014; and Lalumia, 2008). In 2001, the Netherlands undertook a major PIT reform whereby the basic tax deduction of a non-working spouse could no longer be transferred to the breadwinner—an important step towards full individualization. By using single women as a control group, Euwals (2008) finds that this reform increased the female labor-force participation rate in couples by 1.2 percentage points. Jaumotte (2004) provides a comprehensive set of simulations for OECD countries, based on estimated aggregate labor-force participation equations. For an average OECD country, she finds that eliminating tax discrimination against secondary earners (relative to singles) would raise the labor-force participation rate of women by 3.9 percentage points. For Luxembourg, the simulations suggest an increase of 1.8 percentage points. In Luxembourg, there is scope for raising the female labor force participation rate, which at 67.4 percent in 2018, is much lower than in for instance Denmark (76.6), the Netherlands (75.8), Switzerland (79.9), Sweden (81.2) and the UK (73.6).

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