



The Role of Taxes on Investment to Increase Jobs in the EU – An Assessment of Recent Policy Developments in the Field of Corporate Taxes

STUDY



European Economic and Social Committee



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Foreword

The effect of taxes in general, and of corporate taxes in particular, on tax revenues is not well understood. Higher taxes do not necessarily mean more revenues. The amount of taxes unpaid or paid in the wrong country is also not widely known. Many unsubstantiated figures have been used in the debate. Some years ago, the European Commission even stated on its home page that EUR 1 trillion in taxes were not paid. The OECD has since concluded after careful studies that corporate Base Erosion Profit Shifting (BEPS) amounted to USD 100-240 bn before counter measures were taken. The Commission translated this for Europe to EUR 50-70 bn before any anti-tax avoidance directives were decided. The amount is less than 1 percent of GDP - actually 0.35 per cent of GDP.

Given the lack of well-founded information and the use of unsubstantiated statistics in the debate, the Employers' Group of the European Economic and Social Committee asked for this study to be undertaken. The challenge of writing the report and collecting facts and figures was given to three experienced economists: James Watson, Pieter Baert and Frederik Lange.

The main conclusion of the study is that there has been no reduction in corporate tax revenues in relation to GDP. Tax revenues in relation to the size of the economy have been remarkably stable over the last 40 years, despite a substantial reduction of corporate tax rates. As rates have converged to below 20 per cent, more investments have become economically viable. This has also resulted in more jobs and considerable tax revenues from wages and consumption. Corporate tax revenues are mostly in the range of 2-3 per cent of GDP while tax revenues from wages, VAT and payroll taxes together are more than 30 per cent.

The OECD has assessed corporate tax as the most harmful to growth and jobs. Corporate tax is furthermore shifted onto workers, consumers and suppliers. Only a relatively small part of the tax is paid for by the owners of businesses. Workers are important owners, often through their pension plans. Corporate taxes therefore affect everyone. As long as we have a corporate income tax, the tax base should be broad, special incentives should be kept to a minimum, and the rate should be low. Only then will the negative effect on wage earners and consumers be contained.

This study aims to serve as a useful and reliable tool in discussion on taxation. This is especially important in the current situation in the European Union, where public perception of the taxation of companies (especially large internationals) is distorted and exploited by populists. I believe we should therefore provide data and concrete examples which this study does.

Krister Andersson

Vice-President of the Employers' Group of the European Economic and Social Committee

Abbreviations:

ATAD: Anti-Tax Avoidance Directive
BEPS: Base Erosion and Profit Shifting
BIAC: Business and Industry Advisory Committee
CCCTB: Common Consolidated Corporate Tax Base
CBCR: Country-by-Country Reporting
CFC: Controlled Foreign Corporation
DG TAXUD: Directorate-General Taxation and Customs Union
DST: Digital Services Tax
EU: European Union
EESC: European Economic and Social Committee
FDI: Foreign Direct Investment
IFS: Institute for Fiscal Studies
IMF: International Monetary Fund
MNEs: Multinational enterprises
OECD: Organisation for Economic Cooperation and Development
UNCTAD: United Nations Conference on Trade and Development
VAT: Value-Added Tax

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Executive Summary

Chapter 1 – How corporate taxes moved to the top of the political agenda

The economic crisis of the early 21st century, the squeeze it placed on public finances, combined with perceptions of rising income inequality and high-profile allegations of corporate tax avoidance and evasion led to a political drive to reform corporate taxation legislation.

A 2016 survey in the EU revealed that more than 60% of EU-citizens believed that companies in general were not paying their fair share of taxes, with a 2017 survey suggesting the fight against tax fraud was the second highest priority area for the EU to take further action.

The 2012 G20-meeting in Los Cabos, Mexico launched the OECD's Base Erosion and Profit Shifting' project. 13 'Final Reports' were published in 2015 containing (non-legally binding) recommendations. The 2018 progress report on BEPS states that the BEPS now covers 95% of global GDP and 116 countries with implementation of BEPS 'at an early stage'. Ministers have requested to re-open Action Plan 1 (Taxing the Digital Economy), with a final report due in 2020.

The European Commission has issued numerous policy initiatives, in part to enshrine BEPS recommendations in EU law. Proposals have included a Common Consolidated Corporate Tax Base (CCCTB), Public Country-by-Country-Reporting of corporate tax and financial information, an Anti-Tax Avoidance Directive (ATAD), and a tax on parts of the digital economy.

But recent data does not confirm the popular narrative of falling corporate tax contributions. Headline corporate tax rates have fallen significantly across the EU and OECD, but corporate tax revenues as a share of GDP are at a similar level to the 1980s. More generally, public discussion has not always properly reflected the nature of corporate tax as a tax on value creation to be levied in the jurisdiction where the value is created, with for example, erroneous arguments made that companies have not paid tax in a country despite significant sales in a country.

Chapter 2 – Corporate Tax and Incidence

A proper analysis of the impact of a change in corporation tax requires a thorough understanding of who carries the economic burden of this tax – the incidence – not the legal liability.

There is a wide consensus that part of the corporate tax is passed on to people other than the shareholders. The IMF has noted that 'workers, not shareholders, bear the real incidence of the corporate income tax.' Studies find the tax burden on workers of corporate tax ranges from 30% to 400%.

But much public discussion fails to acknowledge the importance of incidence. **Neither the European Commission's Communication on the digital tax or the accompanying 161-page impact assessment contain the word 'incidence'.**

Chapter 3 – The Economic Impact of Corporate Tax Changes

While there are many factors that can affect investment decisions, the European Commission notes that ‘the level of taxation has a significant influence’. **High corporate taxes reduce the after-tax return of an investment, thus making fewer projects economically viable to be undertaken. Empirical studies on the link between corporate taxes and investment generally confirm a negative relationship that economic theory predicts, despite varying widely in their approach.** A literature review referred to by the OECD in 2008 shows that on average, a one percentage point increase in the tax rate on FDI leads to a decline of FDI by 3.7%.

While the **OECD** underlines that all taxes have the potential to discourage growth, its analysis on tax structures **has found corporate taxes to be the most harmful form of taxation to economic growth.** Empirical studies substantiate a negative relationship between corporate taxes and economic growth. For example, Lee and Gordon (2005) show that **cutting the corporate tax rate by 10 percentage points can raise annual growth by 1-2 percentage points.** Similarly, a literature review referred to by the OECD in 2008 shows that on average, a one percentage point increase in the tax rate on FDI leads to a decline of FDI by 3.7%.

Theory suggest a high corporate tax rate can hamper business activity by rendering certain investment projects unprofitable, thereby lowering the tax base and thus revenue collection. Empirical analysis also shows corporate **tax cuts do not necessarily lead to significant shortfalls in public finances.** A study by Mertens and Ravn (2012) suggest **cuts in corporate taxes can be ‘approximately self-financing’.**

Chapter 4 – Event study on the economic impact of corporate taxation

Our study identifies 98 significant changes in corporation tax in 41 EU and OECD countries, between 1981 and 2014, with **significant changes in headline rates have been more frequent than in effective rates.** Our results support existing empirical literature. In particular, we find:

- Our findings suggest that **OECD economies that have reduced their effective corporate tax rates in recent years have seen increases in investment in the following years,** with the positive impact on investment stronger over a 5-year period than a 2-year period.
- **Reductions in corporate tax rates do not appear to have led to falls in corporate tax revenue collection, with six incidences where a cut in the effective corporate tax rate in an OECD economy actually led to an increase in corporate tax revenues.**
- When we consider the broader impact of a corporate tax cut on *overall public* revenues our results even reveal some tentative evidence that **a reduction in the effective tax rate in OECD may actually be likely to lead to an increase in overall public revenue,** as increased company investment increased other tax receipts such as income tax.

Introduction

This study considers the impact on investment, growth and employment, and public finance of changes in corporate tax, through both a review of existing theoretical and empirical literature and a new event study considering the economic impact of significant changes in corporate tax rates in developed economies between 1981 and 2014.

Alongside this, we also consider the extent to which the evidence on corporate tax and growth has been taken account of in recent years in the public debate around corporate tax, and the extent to which questions around the impact on economic growth have been taken account of in the development of tax policy. In more detail:

Chapter 1 explores in further detail how the economic crisis of the early 21st century and the squeeze it placed on public finances, combined with increasing perceptions of rising household income inequality and high-profile allegations of corporate tax avoidance and evasion led to a sustained drive by politicians both in the EU and beyond to reform corporate taxation legislation. We review recent legislative developments in both the EU and OECD and also consider how public perceptions of increasing corporate tax avoidance compare to data on actual tax revenues.

Chapter 2 focusses on the specific issue of incidence - who ultimately bears the economic cost of the tax - an aspect that has been particularly overlooked in recent discussions, but is essential if we are to consider the welfare impact on individuals of any changes in tax policy.

Chapter 3 examines the economic impact of corporate taxation by using both theoretical considerations and empirical evidence. First, we set out how changes in corporate tax rates are expected to affect investment. Second, we evaluate how changes in investment from such corporate tax changes are expected to impact on overall growth and extend this to employment and public revenue. We also consider the impacts of corporation tax in comparison to other taxes, as well as the specific impact on small and medium-sized enterprises (SMEs).

Chapter 4 assess how actual incidences of countries introducing changes in corporate tax rates have impacted on their investment and public revenues (so-called event study). We identify 98 significant changes in corporation tax in 41 EU and OECD countries, between 1981 and 2014. For each of the events identified, we evaluated the changes in investment, FDI, and both corporate and overall public tax revenue in the following years.

Conclusions are drawn at the end of each chapter, including recommendations for the EESC, with the executive summary providing an overview of the approach and findings.

1. How corporate taxes moved to the top of the political agenda

1.1 Corporate tax – definition and rationale

The issue of corporate tax, and in particular corporate tax avoidance and evasion has moved significantly up the public radar in recent years. This chapter explores in more detail how the economic crisis of the early 21st century and the squeeze it placed on public finances, combined with increasing perceptions of rising household income inequality and high-profile allegations of corporate tax avoidance and evasion led to a sustained drive by politicians both in the EU and beyond to reform corporate taxation legislation. We review recent legislative developments in both the EU and OECD and also consider how public perceptions of increasing corporate tax avoidance compare to data on actual tax revenues.

Corporate income tax has existed for more than a hundred years, with the US having installed a federal tax on corporate income of 1% in 1909. Today, nearly all countries around the world have a corporate income tax, apart from a number of small island nations.

The OECD (2014) notes, in its ‘Fundamental Principles of Taxation’ that while the corporate income tax as a concept ‘can be defined in a great variety of ways’, it ‘generally relies on a broad tax base, formulated to encompass all types of income derived by the corporation whatever their nature’ with corporate taxes ‘generally imposed on net profits, that is receipts minus expenses’ and thus not revenue. In the context of an increasingly globalised world, the countries have agreed through the OECD that ‘profits are taxed where economic activities take place and value is created’ (Ibid, 2014).

This latter point regarding corporate tax being based on profits rather than revenue is not always understood in public discourse, with companies with large sales in a jurisdiction, but little value creation, often criticised for the level of tax they pay, despite this being the legal outcome of such activity. For example, Margaret Hodge, a high-profile member of the UK parliament, and former chair of the House of Common’s public accounts committee commented on Twitter, that it was, ‘absolutely outrageous that Facebook’s UK tax bill is 0.62% of their revenue here; on an income of £1.2bn they really should be paying much more than £7.4m’¹. Such unfounded arguments are clearly unfairly damaging to business, with the OECD noting that ‘MNEs may face significant reputational risk if their effective tax rate is viewed as being too low’ (OECD, 2013a).

Devereux and Sorensen (2006) explore the rationale for the corporation tax, or specifically, ‘why do we want to impose a specific tax on corporation in the first place?’

- Firstly, drawing on the concept of tax incidence (considered in more detail in chapter 2), that corporations cannot bear any tax burden and that ‘the burden of corporate income tax must be borne by individuals in their capacity as owners or employees or as consumers’, they suggest that an important rationale is that ‘it would be difficult to administer a tax on all the capital income

¹ The Guardian (2018): ‘Facebook’s UK tax bill rises to £15.8m – but it is still just 1% of sales’
<https://www.theguardian.com/technology/2018/oct/08/facebook-uk-tax-bill-sales-margaret-hodge>

accruing to any individual'. The literature points in particular to three issues with attempting to tax capital income only at the level of the individual.

- 1) Such a system may increase tax avoidance. Tax Justice Network (2015) suggests for example, that individuals 'could leave their earning inside the corporation and defer paying personal income tax on them indefinitely' using a variety of 'ruses' to extract wealth without paying personal income taxes.
- 2) Individuals would be incurring a tax liability on retained profit of the corporation which they hadn't received dividend on, creating a cash flow/ liquidity problem for them.
- 3) In a globalised world, where shareholders are increasingly located in a different tax jurisdiction from where the corporate tax liability is (i.e. where the value is created), such a system would de facto shift taxing rights from the host country of the firm to the country where the individual was resident.² Such a system would require both a new international agreement and increased administration and enforcement cost.³

As an aside, we should note that the corporate tax has the potential to tax individuals twice on their corporate income, once through the corporate tax system and again through the personal income tax system). While it is in theory possible to allocate a fraction of a company's taxable profits to each shareholder in proportion to his or her share in the ownership of the company, and provide a credit/rebate at the personal tax stage, administrative challenges as well as increasing proportions of overseas shareholders mean that such imputation systems have become more difficult to implement in practise and less comprehensive in recent years.⁴

- Secondly, Devereux and Sorensen consider the related arguments that 'corporation tax acts as a charge for public goods provided by the government and consumed by the company,' or that 'corporations ought to pay their fair share of tax' – a justification that as we shall see, has been widely put forward by politicians in recent years. Regarding the former, they note that there is no clear relationship between the tax a company would pay on its profits and the value of the public goods it enjoys, and that, 'if the aim is to charge for public goods, a more straightforward way to achieve this would be to do so directly'. We should note that many countries do levy some form of business rates, often levied on the value or size of the property a company occupies as a means of charging for public services. Regarding the latter issues of fairness, they emphasise the incidence point noted above that 'corporations cannot bear any tax burden', but also note that since the corporation tax is an impersonal tax, 'it is not well suited to help policy-makers shape the profile of personal income tax.'

² In fact, Devereux and Sorensen note that this issue provides an incentive for governments to maintain and even increase corporation tax rates, and may explain why tax rates did not fall more dramatically in the period to 2005, despite increasing capital mobility.

³ For example, the Institute for Fiscal Studies (IFS, 2011) notes, 'it would in theory be possible to allocate a fraction of those taxable profits to each shareholder in proportion to his or her share in the ownership of the company, and to tax this share of the company profits under the personal income tax.' However, while this may have been true in times of small corporations, today the administration to cope with companies with hundreds of shareholders, both national and foreign, would be 'administratively cumbersome'.

⁴ Currently only a few countries use dividend imputation (e.g. Australia, New Zealand and Malta), although many countries have some arrangements to attempt to, at least in part, address double taxation, such as rebates or other special tax treatment of dividend income (for more details see for example The Association of Superannuation Funds of Australia, 2015 and IFS, 2011).

- Finally, they note that it would be possible, in theory to design a corporation tax that was efficient, not impacting on economic behaviour if such a tax was only levied on economic rent, defined as ‘profit over and above that necessary to justify a particular investment’. But the authors note that in practise, ‘corporation taxes are not efficient (...) they are levied on the entire return to equity and so they do distort investment and financing decisions on companies.’

1.2 Pressure on public finances raises interest in corporate tax

The recent increase in public interest in corporate tax has its roots in part in the squeeze in public finances that took place during the financial crisis. The EU’s economic output dropped by more than 4% at the outbreak of the crisis in 2008, and only returned to its pre-crisis level in 2015. As a consequence of lower economic output, total general government revenue in real terms fell by 6.4% in the EU-28 between 2008 and 2009, compared to a fall in real GDP of 4.3%. Over the entire crisis, the impact was even stronger, particularly as investment and hence the economies’ productive capacity fell. In the UK for example, the Institute for Fiscal Studies suggested that the financial crisis and associated recession had ‘punched a permanent hole in the public finances of 7.5% of national income’ (IFS, 2012). Other major economies had similar significant government deficits as well, such as France, where annual deficits remained above 5% for four consecutive years between 2009-2012.

At the same time as revenue was falling, finance ministers were faced with the challenge of increasing expenditure to cover rising benefit payments, as well as ongoing longer-term pressure from population ageing including rising pension and health care costs, with in many cases, government having taken on additional debt to fund the bail-out of failing financial institutions.

Whilst government took on increased debt in the short-term, the longer-term response was focussed on reducing public expenditure, with, for example, the UK adopting a so-called 80/20 approach (The Guardian, 2013), with around 80% of the reduction in the shift in the public finances to come from reduced expenditure and 20% to come from increased taxes. Nevertheless, politicians were aware that even closing 20% of the public finance gap through increased taxation would be a challenge given the falls in real incomes during the period.

1.3 Perception of rising income inequality

Whilst reduction in public expenditure and increased taxes are never popular, there was a growing sense that the pain of fiscal consolidation had not been spread fairly or evenly. The OECD for example noted in 2013 that ‘the pain of the crisis was not shared evenly’ when the crisis started (OECD, 2013b). They argued that while households at all wage levels lost disposable income during the initial years of the crisis, those at the lower end of the scale lost [proportionately] more, as a consequence of which, the rise in average market income inequality between 2007 and 2010 was higher than was observed in the previous 12 years as a whole (Ibid.).

Moreover, the OECD subsequently warned that once economic growth had picked up, around 2013/2014, ‘incomes at the bottom of the distribution [were] still well below pre-crisis levels while top and middle incomes had recovered much of the ground lost during the crisis’, (OECD, 2016a).

This is not to say that governments did not attempt to use the tax and benefit system to spread the pain of the crisis. The OECD (2015a), for example notes that during the initial years of the crisis, as part of fiscal stimulus packages, countries had still enough money left to compensate for the rising amount of unemployed people, whereby taxes were working efficiently as a ‘cushion’ to soften the rise in inequality. But as governments moved to fiscal consolidation as the crisis continued, by reducing the money available for public services and compensations for the unemployed, the cushioning effect of taxes and benefits (had) become weaker, ‘accelerating the overall upwards trend in disposable income inequality’ (Ibid.).

Finally, the growing perception of rising inequality was further fuelled by media reports highlighting data and analysis, with in particular, Thomas Piketty’s book on the history of income inequality ‘Capital in the 21st Century’, in which he argued for a global wealth tax, becoming a worldwide bestseller as it dealt, according to The Economist, with ‘the right subject at the right time’ (The Economist, 2014).

1.4 A ‘race to the bottom’ and the ‘tax papers’

The crisis period also led to a growing public debate around the levels of corporation taxes companies were paying, with a steady stream of press reports around Europe. Belgian daily newspaper ‘Het Nieuwsblad’ (2012) ran the headline ‘Companies paying zero eurocent in taxes despite billions of profits’, with e.g. AB INBEV (a Belgian brewery holding) allegedly paying zero taxes in Belgium between 2007-2012. Those concerned that companies were not properly paying enough corporation tax could also point to gradual cuts in headline corporation tax rates between 2000 and 2008, when the average EU-15 corporate income tax rate fell from 36.3% to 26.0% (European Commission, 2018a).

However, media coverage also failed to properly recognise corporate tax as a being a tax on profits with profits deemed to have arisen where value is created. Thus stories such as those of the UK’s The Guardian (2012) ‘Starbucks pays £8.6m tax on £3bn sales’, which compared corporate tax payments to sales, or those such as the Netherlands NRC (2008) ‘Multinationals paying little to no taxes’ or France’s Le Figaro (2014) ‘Why does Total pay no corporate income tax?’, which considered only tax payments in a single jurisdiction, with no consideration given to global payments, did little to contribute to an informed public debate.

Whilst, as we note below, the G20 already asked the OECD to work on the issue of base erosion and profit shifting in 2012, the political drive to be seen to address the issue was intensified as a series of studies, published between 2013 and 2017, by teams of newspapers’ investigative journalists described how firms (as well as high net worth individuals including politicians, business leaders and

celebrities) made use of (often legal) complicated tax structures, sometimes diverting income to countries with low tax rates, in order to reduce their tax liabilities.

For example, the 30,000 pages Luxleaks report⁵ alleged that large companies were provided with tax agreements by the Luxembourg government to reduce their tax liability. This was often done with, according to the reporters, ‘complicated accounting’ as well as ‘legal structures’ (ICJI, 2014). An often-recurring practise alleged in such reports was that of so-called ‘treaty-shopping’, whereby by companies would establish branches in countries with favourable tax treaties. In those cases, such companies would have limited substantial activities, prompting the term ‘letterbox companies’ or in the words of the OECD, such companies would ‘exist on paper but have no or hardly any substance in reality’ (OECD, 2015b).

In the case of the Panama Papers, a collection of more than 11 million documents released in 2016 and described by the BBC (2016) as the biggest data leak in history, the fact that allegations centred primarily on individual tax avoidance⁶ did not stop corporates coming under criticisms. When news broke out on the Panama Papers, it was used by e.g. the European Public Service Union (2016) and the political group Socialist & Democrats (S&D, 2016a) to drive forward a proposal on Public Country-by-Country-Reporting, whereby certain companies would need to publicly disclose their global allocation of the corporate income, economic activity and taxes paid among countries, despite the Panama Leaks mainly centring on individual tax avoidance.

As a consequence of these developments, corporate tax now represents a key political topic. For example:

- In a Eurobarometer-survey for the European Parliament (2017b) in view of the European elections in 2019, the fight against tax fraud was identified by 60% of European citizens as the area where they felt the EU was taking insufficient action, the second highest average after the fight against unemployment (63%). In another Eurobarometer survey for the European Parliament (2016), 75% of respondents had identified the fight against tax fraud as a political priority for the EU⁷, with the highest averages found in Portugal (91%), Spain (89%), Slovenia and Cyprus (86%).
- An EU-wide survey, conducted in 2016, revealed that more than 60% of EU-citizens believed that companies in general were not paying their fair share of taxes (Edelmann, 2017). In the same survey, tax compliance was singled out as the top criterion to citizens for having ‘trust’ in a company.

⁵ Other reports on tax behaviour that gained much media attention include e.g. Offshore Leaks (2013), Swiss Leaks (2015), Panama Papers (2016), Bahamas Leaks (2016) and Paradise Papers (2017).

⁶ Drawing on more than 11 million documents the authors alleged how Mossack Fonseca, a Panamanian law firm and corporate service provider, helped global clients, largely individuals, reduce their tax liability. A European Parliament study estimated that the EU-countries lost per annum between 109 billion and 237 billion to the tax schemes revealed in the Panama Papers (European Parliament, 2017a).

⁷ While the survey refers to the fight against tax fraud, it can be assumed that citizens responded with widely-reported stories on tax avoidance and tax evasion in mind (as well), without making a clear distinction between the three concepts. The survey also refers to taxation in general, and not just by corporates.

- In the US, citizens highlighted corporations not paying their fair share of tax as the most frustrating aspect of the US Federal Tax System, ahead of the amount they have to pay themselves as citizens or the complexity of the system (Pew Research Center, 2017).

At the same time, political actors have become increasingly strident on the issue. For example, the European Trade Union Confederation noted that those multinationals who avoid tax were ‘immoral (...) at a time when citizens are paying the price for the crisis’ (ETUC, 2014). Following the Panama leaks, the European Parliament also established a dedicated committee (PANA) on 8 June 2016 to investigate alleged money laundering, tax evasion and tax avoidance.

1.5 Policy action at OECD-level

The increasing public debate on the alleged under taxation of corporates and distrust towards companies’ tax compliance gave policymakers additional impetus to act, both at national and international level.

While the fight against corporate tax avoidance in the OECD had been going on long before the start of the financial crisis, it was in 2012 at the G20-meeting in Los Cabos, Mexico that the Communiqué stated there was a ‘need to prevent base erosion and profit shifting’ in particular and looked forward to OECD-work on this (G20, 2012). The OECD published in turn an initial report on ‘Addressing Base Erosion and Profit Shifting’ in February 2013, where they presented ‘the key principles that underlie the taxation of cross-border activities, as well as the BEPS opportunities these principles may create’ (OECD, 2013c). The report recommended that an action plan ‘should be developed quickly (...) to provide countries with instruments, domestic and international, aiming at better aligning rights to tax with real economic activity’ (Ibid.).

The full BEPS action plan was published on 19 July 2013 at the G20 meeting of Finance Ministers and Central Bank Governors in Moscow. This Action Plan identified fifteen areas where tax rules needed to be updated and strengthened, including e.g. addressing tax challenges in the digital economy, developing a new set of standards to prevent double non-taxation and improving tax data collection. The G20 Communiqué at the meeting in Moscow urged participating countries ‘to tackle the 15 issues identified in the Action Plan and commit to take the necessary individual and collective action’ (G20, 2013). The OECD recognised in the Action Plan firstly the economic urgency, warning that inaction in this area would lead to ‘global tax chaos’, with many cases of double taxation⁸ (OECD, 2013a). Secondly, the OECD viewed the Action Plan as a response to the public’s expectations, following the ‘tense situation in which citizens have become more sensitive to tax fairness issues’ (Ibid.).

⁸ International double taxation arises when comparable taxes are imposed in two or more states on the same taxpayer in respect of the same taxable income or capital, e.g. where income is taxable in the source country and in the country of residence of the recipient of such income.’ (OECD, Tax Terms Website)

However, while acknowledging the increased perception and sensitivity to tax compliance, the OECD did not single out companies in general nor did it regard 'BEPS as a problem created by one or more specific companies' (OECD, 2015b). They added that 'apart from some cases of egregious abuses, the issue lies with the tax rules themselves. Business cannot be faulted for using the rules that governments have put in place. It is therefore governments' responsibility to revise the rules or introduce new rules' (Ibid.). All fifteen Action Plans are summarised in annex A.

In light of the recent stream of press reports on the amount of corporate tax paid by well-known companies (see above), it was thus not surprising that the launch of the BEPS-Action Plan gained much public and political attention. At the launch of the Action Plan in Moscow, the Secretary-General of the OECD, Angel Gurría, spoke of addressing BEPS as a challenge that 'lie(s) at the heart of the social contract' recognising that 'citizens are demanding that we tackle offshore tax evasion (...) to prevent multinational enterprises from artificially shifting profits (...) thereby eroding our tax base' (Gurría, 2013).

At European level, the European Commissioner for Taxation, Custom, Statistics, Audit and Anti-Fraud, Algirdas Semeta, called the BEPS Action Plan 'a welcome and long overdue step', describing the system at the time as 'unfair' and 'requiring urgent reform' (International Tax Review, 2013). UK Chancellor George Osborne similarly saw the Action Plan as 'a huge milestone on the road to making the international tax rules fairer' (Gov.uk, 2013) and Dutch State Secretary of Finance Frans Weekers viewed the Action Plan as 'a promising framework to further strengthen rules on a worldwide basis' and invited developing countries to participate in the framework (Weekers and Ploumen, 2013).

The European Economic and Social Committee (EESC) also welcomed the BEPS project calling it 'essential to combating tax evasion and aggressive tax planning at global level' and encouraged the G20, the OECD and all the Member States to further develop it (EESC, 2014). There was also support from the business community who welcomed the BEPS initiative, with e.g. the Business & Industry Advisory Committee at the OECD (BIAC) acknowledging that 'the international tax system (had) not kept pace with globalisation and changing business models' and welcomed the OECD to take up its role as 'the standard setter for international tax rules' (BIAC, 2013).

Two years after the launch of the Action Plan, 13 'Final Reports'⁹ were published on 5 October 2015 and agreed at the G20 Finance Ministers meeting in Lima, Peru three days later. The publication of the final reports was welcomed across the world. The European Commissioner for Economic Affairs, Taxation and Customs, Pierre Moscovici, saw the agreement as 'a reaction of people who cannot stand anymore that they pay their fair share of taxes, that they contribute to fiscal consolidation while companies, especially multinationals, can avoid tax' (Reuters, 2015). US Treasury Secretary Jakob Lew stated that 'the United States (was) proud to have played a leading role in developing the BEPS recommendations' (Lew, 2015). The German Finance Minister, Wolfgang Schäuble, described the completion of the BEPS-project as 'a milestone (...) Working together to fight tax avoidance pays off for all of us' (Bundesministerium der Finanzen, 2015).

⁹ Actions 8, 9 and 10 were issued as a single report.

The OECD summarised the results as ‘a comprehensive package of measures’ (OECD, 2015b). Some of the measures could be introduced domestically, while the majority needed to be negotiated via bilateral tax treaties. In terms of agreed measures and their implementation, it should be noted that the OECD is not a legislator itself but rather works through soft law instruments. The Final Reports are agreed by consensus, but contain (non-legally binding) recommendations in the shape of guidelines or minimum standards. While participating countries cannot be forced to implement these actions, the OECD notes that ‘practice accords them great moral force as representing the political will of Adherents’. However, straight after the meeting in Lima where the final reports were agreed, some concern arose over the implementation of the agreed rules, with UK Chancellor George Osborne urging the OECD to ‘call out countries that are not implementing what has been signed up to’ (Reuters, 2015). The business community echoed a similar concern, with BIAC (the Business and Industry Advisory Committee at the OECD), while broadly welcoming the outcome of all action plans, noting that some action plans ‘left work open’ and needed more details ‘to ensure the proposals are administratively feasible, and implemented consistently’ (BIAC, 2016).

The OECD noted that as public pressure was high and since BEPS covered a wide array of topics, four minimum standards would need to be adopted where ‘action was urgent’ and where ‘no action would have created negative spillovers (including adverse impacts of competitiveness) on other countries’ (OECD, 2015b). These four mandatory minimum standards, where all countries have committed themselves to consistent implementation, are summarised in annex B.

An essential element in the implementation of the minimum standards and the other numerous BEPS-measures of the other Action Plans was the so-called ‘Multilateral Instrument’. At the start of the BEPS-project, countries realised quickly that implementing the BEPS-measures in separate bilateral tax negotiations would be ‘time-consuming, resource-intensive and cumbersome’ and would take ‘decades’ (Gurria, 2017). To make the numerous changes, as agreed in the other final reports as swiftly and efficiently of possible, the participating countries developed, under the heading of Action 15, a Multilateral Instrument (MLI). As the name suggests, the multilateral instrument would allow countries to update their tax treaties on a swift multilateral basis (in a more cross-reference overview) to include the new BEPS-measures, as opposed to separate negotiations on each individual income tax treaty. The MLI entered into force on 1 June 2018, and its contents will start to have effect for existing tax treaties as from 2019. As of February 2019, 87 jurisdictions had signed the MLI.

Box 1: Corporate Tax Avoidance in Perspective

Facts & Figures:

- EU-Member States collected in 2016 €391.2 billion in corporate income taxes, about 6.8% of the total tax revenue collected in the EU that year (€6.6 trillion) (Ameco & European Commission).
- According to the OECD, base erosion and profit shifting amounted in 2013 to ‘annual losses of anywhere from 4-10% of global corporate income tax (CIT) revenues, i.e. USD 100 to 240 billion annually. This estimate predates the implementation of the BEPS-measures.
- The IMF has estimated that corporate tax avoidance through profit shifting costs 400 billion to the OECD, roughly 1% of OECD GDP (De Mooij and Keen, 2015). This estimate predates the BEPS-measures.
- The European Commission estimates that, based on a European Parliament study (2015), corporate tax avoidance through profit shifting costs between €50-70 billion a year in the EU.
- The same European Parliament (2015) study notes that ‘if a complete solution to the problem of base erosion and profit shifting were available and implementable, it would have an estimated impact of 0.2 percent of total tax revenues for governments.’ Based on the total tax revenues received by EU-governments in 2016, this would be an additional revenue of €13.2 billion.

Due to the topic’s complexity and sensitivity, the subject of corporate tax compliance often falls victim to misrepresentation.

- For example, in a press release by the Socialist & Democrats group for the European Parliament on 8 June 2016, the group claimed that ‘EU countries suffer between €100-240 billion in lost taxes every year due to aggressive corporate tax planning’ (S&D, 2016b). This figure actually relates to the OECD-countries in total (and is heavily influenced by the USA). The EU’s figure is €50-70 billion.
- As mentioned above, in a Eurobarometer survey of 2016, 75% of respondents had identified the fight against tax fraud as a political priority for the EU. While the survey asks EU-citizens about the fight against tax fraud, it can be assumed that respondents answered with the widely-reported stories on tax avoidance and tax evasion in mind (as well), without making a clear distinction.

According to the OECD-progress report on BEPS from July 2018, the OECD/G20 Inclusive Framework on BEPS, through which the BEPS-project is taken forward, now represents 95% of global GDP and welcomed 15 new members in 2017, increasing the total amount of members to 116 countries (OECD, 2018a). Implementation of the BEPS measures is currently ‘at an early stage’ and

the review of the ‘minimum standards’ is ‘well underway’ with tangible results on these ‘yet to come’ (Ibid. 2018). Looking forward, the OECD/G20 Inclusive Framework on BEPS does feel that further measures will need to be taken. They have requested to re-open the Action Plan 1 (Taxing the Digital Economy), and have demanded a further final report on this topic in 2020.

1.6 BEPS – a battle between countries for global corporate tax revenue?

Arguably one weakness of public discontent around corporate tax avoidance is that it fails to distinguish between the issue of whether the public are concerned that corporates are not paying a large enough proportion of their global corporate tax payments to a given jurisdiction (normally those from where they are citizens) or whether they are not paying enough globally.

Similarly, it would be incorrect to characterise the current discussion around corporate tax as simply an issue of ensuring companies pay enough corporate tax globally. As the OECD’s action plan, acknowledges, BEPS also seeks to address the issue of ensuring there is agreement around the rules and application of them, regarding the division of corporate tax between jurisdictions. The BEPS action plan notes for example, that ‘In the changing international tax environment, a number of countries have expressed a concern about how international standards on which bilateral tax treaties are based allocate taxing rights between source and residence States’, warning that if the BEPS Action plan fails to develop effective solutions, ‘some countries may be persuaded to take unilateral action for protecting their tax base, resulting in avoidable uncertainty and unrelieved double taxation.’ Or as the Sydney Morning Herald wrote¹⁰, ‘as tax havens disappear, global revenue wars begin’.

The European Commission’s conclusion in 2016 that Ireland granted undue tax benefits of up to €13 billion to Apple (European Commission, 2016a) was widely seen as battle between tax jurisdictions for revenue, with The Financial Times (2016) noting that that the Apple case could ‘spell a global tax war’ when the ‘US Treasury (...) worries about taxpayers footing the bill in forgone tax receipts if more is taken by European countries’, whilst the Apple CEO, Tim Cook, argued in an open letter that, ‘at its root, the Commission’s case is not about how much Apple pays in taxes. It is about which government collects the money’ (Apple, 2016). In response to the Commission action to introduce Public-Country-by-Country Reporting, then US Deputy Assistant Secretary for international tax affairs at the US Department of Treasury, Bob Stack suggested that ‘countries (are) using BEPS as an excuse to justify what are often blatant revenue grabs’ (Stack, 2016).

More recently, the European Commission initiative to launch a Digital Services Tax (DST), has also been criticised as simply a means to increase the EU’s share of global tax revenue. For example, the European Centre for International Political Economy (2018) arguing that the digital taxation initiatives are part of ‘a zero-sum game between countries that seek to claim a bigger share of corporate revenues as their tax base, at the expense of other governments.

¹⁰ Sydney Morning Herald (2015): ‘As Tax Havens Disappear, Global Revenue Wars Begin’

<https://www.smh.com.au/business/the-economy/as-tax-havens-disappear-global-revenue-wars-begin-20151012-gk7bg0.html>

1.7 Policy action at EU-level

Following on from the BEPS-project, the European Commission has issued numerous policy initiatives which stress the importance of businesses paying income taxation and end unfair loopholes. In his first state-of-the-union address to the European Parliament as President of the European Commission (2015a), Jean-Claude Juncker expressed his wish ‘to enhance fairness in our taxation policies.’ Under his presidency, a series of proposals were launched by the Commission to increase corporate tax compliance tax and transparency. While these often enshrine BEPS-recommendations in EU-law, the European Commission has also taken initiatives which encourage member states to go further in order to have the EU ‘lead by example in international tax good governance’ (European Commission, 2018b).

The most comprehensive reform of corporate taxation was tabled in the proposal on a Common Consolidated Corporate Tax Base, or CCCTB, which would install a common rulebook to calculate a company’s taxable profits across the EU. Next to this, in terms of consolidation, the CCCTB would allow a company to offset profits in one Member State against losses in another. The European Commission put the CCCTB proposal forward as a way to both improve the Single Market for businesses and to reduce tax fraud and evasion by installing anti-abuse measures. The Commission admitted in its impact assessment that having both goals would involve a ‘trade-off’: ‘reducing costs for companies and fostering investment (...) could in some cases be difficult to reconcile with ensuring effective taxation by reducing tax planning opportunities’ (European Commission, 2016c).

Following from BEPS Action Plan 13, EU-Member States are already publishing Country-by-Country-Reports (CBCR). However, the European Commission decided to go one step further than the BEPS arrangements in an effort ‘to lead by example’, by publishing a proposal in 2016 to make these CBC-reports public, a.k.a Public CBCR. By making these reports public, this will ‘push companies to pay tax where they make profit’. However, the OECD warned that this proposal would hinder progress at OECD with countries outside the EU being ‘very much opposed’ to the idea of Public CBCR (Bloomberg, 2018).

The Anti-Tax Avoidance Directive (ATAD), which in many ways goes further than the BEPS minimum standards, covers legally binding anti-abuse measures, such as strengthened controlled foreign company rules, in order to deter profit shifting to low or non-tax countries, and switch-over rules, to prevent non-double taxation of certain income (e.g. dividends and capital gains which enter the EU from third countries). The ATAD was implemented in 2019.

The EU does not always necessarily follow BEPS-recommendations, for example in the case of the digital economy. The focus on corporate tax paid has taken a notable role in the debate on the taxation of the digital economy in particular. With online commerce and social media increasingly prominent today, politicians and policymakers have questioned whether these activities are being taxed in line with the value they create. While the OECD is still debating what specific measures should be taken to address the current challenges, with a final report expected in 2020, the European Commission has

already launched a proposal for a Digital Services Tax, which would tax the revenue of certain services provided by digital companies.

1.8 Do the economic data confirm the popular narrative of falling corporate tax contributions?

This chapter has described the process whereby governments reacted to a public perception of companies paying steadily declining levels of corporation tax, which had themselves contributed to rising inequality. But to what extent does actual data confirm this popular narrative?

We will now consider the evolution of corporate income tax rates (both headline and effective) across the EU¹¹ and OECD¹² between 1981 and 2017, as well as the corporate income tax revenue compared to GDP. While publications such as the European Commission's annual Taxation Trends Reports (2018a) and the OECD's Taxation database makes use of simple, unweighted averages, we consider it to be more relevant to use averages weighted by the size of countries GDP to consider the real impact on businesses. In this paper's technical annex, you will also find the simple averages.

The analysis points to 3 key points:

- a) Headline corporate tax rates have fallen significantly across the EU and OECD, particularly prior to 2007.**

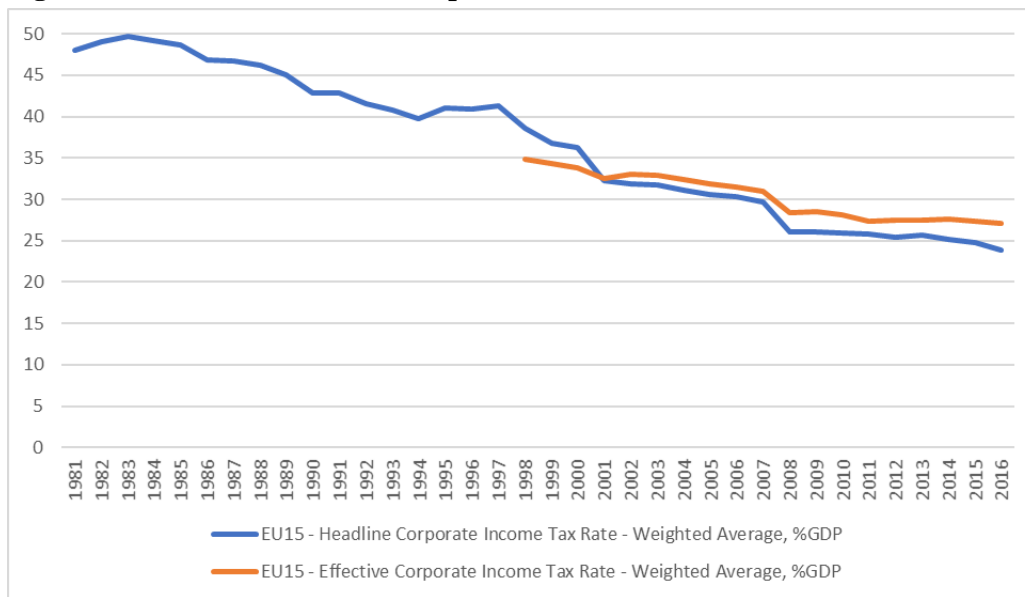
Figure 1 shows the well documented fall in headline corporate tax rates which took place in the EU15 particularly during the 1980s (falling from 48% in 1981 to 42.8% in 1990) and the late 1990s. Data for the full EU27 is available over a shorter timeframe, but nevertheless shows a similar pattern.

Whilst the fall in the OECD average has been less strong during this period (see figure 2) - the OECD 2016 average stands at 28.1% compared to the EU's 23.8% - this largely relates to the strong weighting of the US, and so the OECD average is likely to fall significantly when the recent US tax reform (2018) is accounted for in the data. Figure 1 and 2 also illustrate how the cut in headline rates has been slowing down. It is easy to see why David Bradbury – Head of Tax Policy at the OECD – described the current situation as a ‘race-to-the-middle’ rather than to the bottom (KPMG, 2018). Also, the European Commission notes that there is currently ‘a distinct slowdown’ in falling corporate tax rates (European Commission, 2018a).

¹¹ Due to the availability of data and in order to make a comparison over a longer period of time, our analysis considers ‘the EU15’: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden and the United Kingdom.

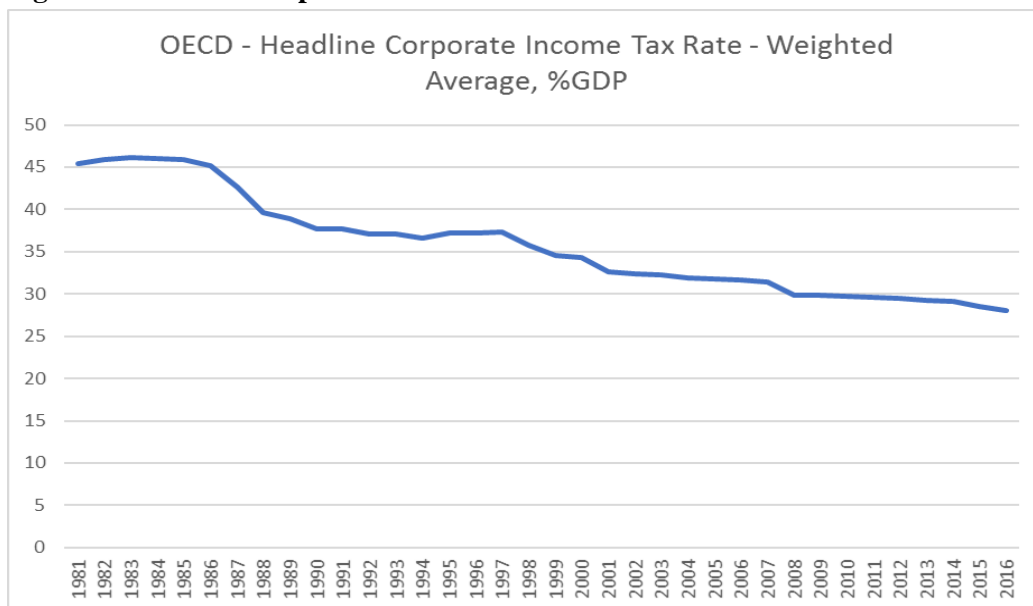
¹² Due to the availability of data and in order to make a comparison over a longer period of time, the OECD Member Countries selected are the EU15 + Australia, Canada, Japan, New Zealand, Norway, Switzerland and the United States of America.

Figure 1: Headline & Effective Corporate Tax Rates – EU15



Source: OECD Tax Database & European Commission

Figure 2: Headline Corporate Tax Rates - OECD



Source: OECD Tax Database

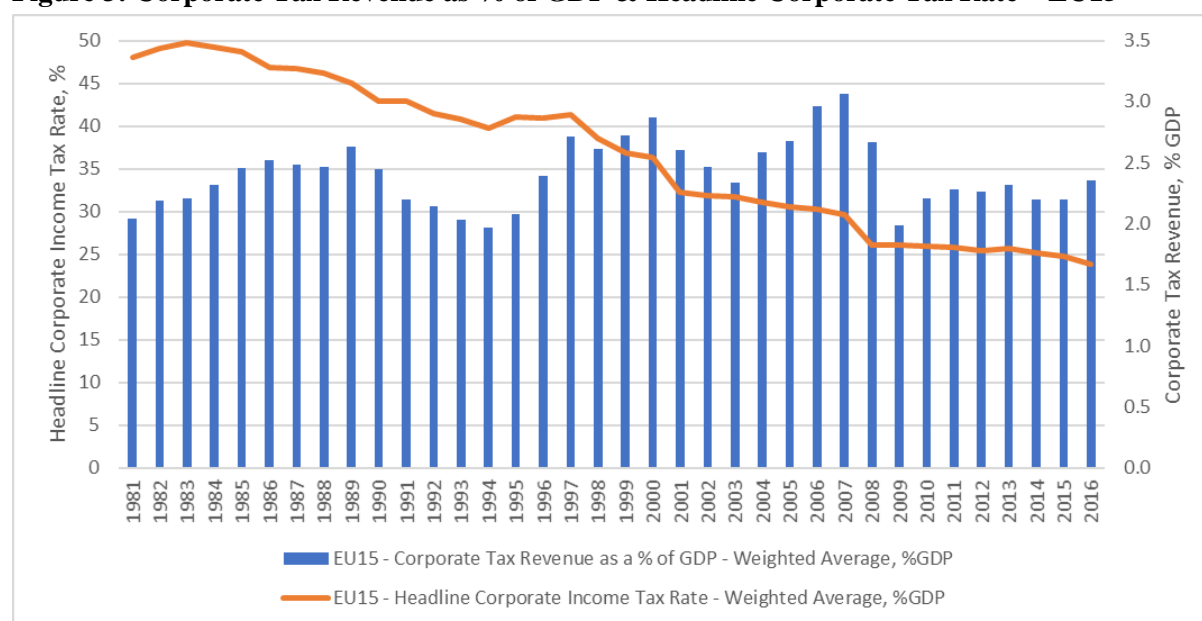
b) The fall in effective corporate tax rates in the EU has been less significant than the fall in headline rates

We emphasise later in this study the importance to businesses of effective, rather than headline rates. Data on effective rates¹³ is less extensive than for headline rates, however as shown in fig 1, the fall in the effective rate in the EU15 has been much less extensive than that in the headline rate, being initially lower than the headline rate when the series begins in 1998, but higher in 2016. While the EU15's average headline rate fell by 14.8 percentage points between 1998 and 2017, the effective rate fell by 7.8 percentage points.

c) Corporate tax revenues as a share of GDP are at a similar level to the 1980s, despite significantly lower headline rates

Figures 3 and 4 show for both the EU15 and the OECD, despite the trend observed above of falling corporate tax rates, that average corporate tax revenue as a share of GDP has stayed relatively stable in the EU and the OECD, with levels as a share of GDP in 2016 of 2.4% (OECD) and 2.4% (EU) broadly the same as in 1981 when average revenue was 2.6% and 2.0% respectively.

Figure 3: Corporate Tax Revenue as % of GDP & Headline Corporate Tax Rate – EU15

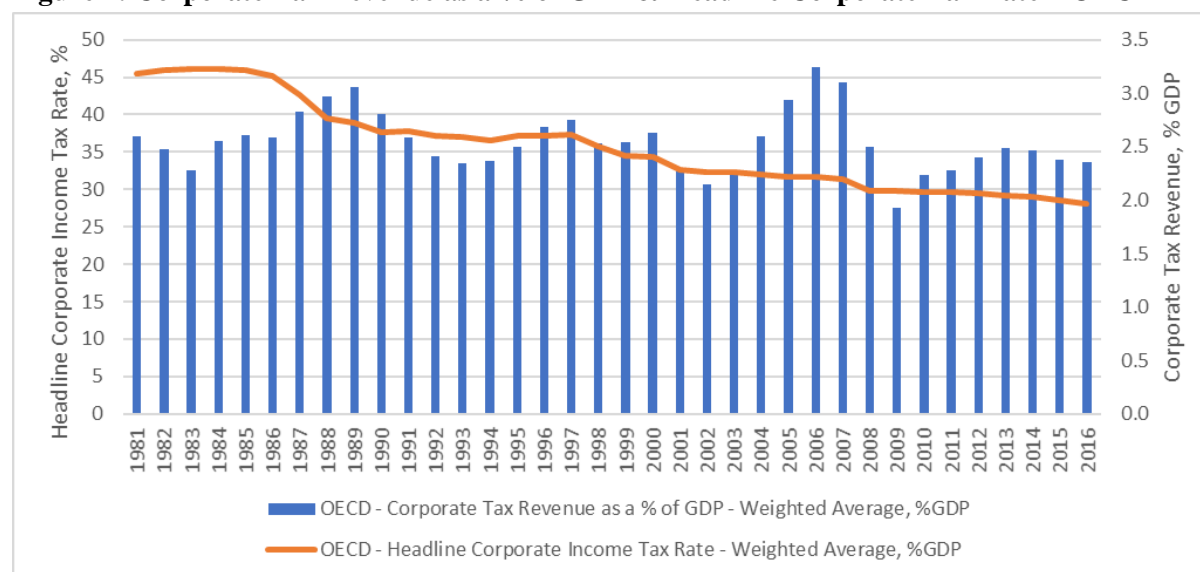


Source: OECD Tax Database

During the period, there has of course been volatility in receipts. For example, following the financial crisis, there was a fall in corporate tax revenue, as profits fell even more quickly than economic activity. Most striking is period between 1983 and 1989, when average headline corporation tax rates fell strongly in the OECD, whilst revenue actually increased as a share of GDP from 2.3% to 3.1%.

¹³ The effective tax rate takes account of a series of factors, not only the corporate headline rate. This includes statutory corporation tax rates, including surcharges and typical local tax rates on profit, as well as various special rates which apply to specific forms of income or expenditure (corporate real estate taxes, net wealth taxes and other non-profit taxes on assets, ...).

Figure 4: Corporate Tax Revenue as a % of GDP & Headline Corporate Tax Rate – OECD



Source: OECD Tax Database

How can corporate tax revenue increase despite a fall in headline rates?

The most obvious explanation for the fact that corporate tax revenues slightly increased for much of the period, despite the fact that average headline rates fell, is, as we consider in more depth in chapter 2, that lower rates act as an incentive to invest and increase economic activity and can be self-financing.

Some commentators have also stressed the importance of the fall in effective corporation tax rates being smaller than those cuts in the statutory tax rate¹⁴. It is argued that cuts in the headline rates have been offset by a ‘broadening of the corporate tax base in the form of reduced investment tax credits, less generous loss offset rules and limitations on interest deductibility and depreciation’ (Cozmei, 2015).

It has also been argued in a European Commission paper by de Mooij and Nicodème (2008) that shifts in the compositional structure of the economy, notably self-employed people incorporating their businesses, may have played a role in increasing corporate tax revenue (at the expense of personal tax revenue).

Looking forward, we are also likely to see some increases in global corporate tax revenues as a result of the implementation of the numerous tax transparency, anti-fraud and anti-avoidance measures developed by the OECD, EU and individual states. These are likely to have resulted in a much stricter enforcement of (corporate) tax policy, the closure of loopholes and discouragement of some aggressive tax planning. Given the last year in the chart on figure 4 is 2016, some of these increases are likely to further boost revenue, whilst further measures, which are currently being implemented

¹⁴ Between 1998 and 2017, EU27 average corporate tax rates fell by 12.1 percentage points, while EU27 average effective corporate tax rates fell by 8.9 percentage points.

(such as the EU's Anti-Tax Avoidance Directive, which in many ways goes beyond the BEPS-minimal standards), can also be expected to lead to further corporate tax revenue for countries in the years to come.

1.9 Conclusions

In recent years we have seen growing public concerns regarding the level of corporation tax payment, which alongside tighter public finances have contributed to a strong policy response from politicians.

This chapter has highlighted that much of the public discussion that has accompanied this policy response has been poorly informed. Public discussion has often not properly reflected the nature of corporate tax as a tax on value creation to be levied in the jurisdiction where the value is created, with erroneous complaints often made that companies have not paid tax in a country, despite significant sales in a country frequently made. More generally, it may be the case that companies are unfairly bearing the brunt of individuals' frustrations with the structure of the global corporate tax system, despite the fact it is the role of businesses simply to comply with tax rules, not to decide them. In particular, the current discussion over the reform of the global corporate tax system has been characterised by many informed commentators as increasingly a battle between countries for their share global corporate tax revenue, rather than the more generally held view that it is an attempt by governments collectively to increase global corporate tax revenue.

Similarly, this chapter shows that despite widespread claim regarding tax evasion and avoidance, as well as falls in both headline and effective corporation tax rates, corporation tax revenue as a share of GDP has remained around its long-term level.

2. Corporate Tax and incidence

2.1 The role of incidence in the debate on corporate income tax

The previous chapter highlighted various ways in which the discussion around corporate taxation has been poorly informed and has arguably presented businesses in an unfairly critical light. This chapter focusses on the specific issue of incidence - who ultimately bears the economic cost of the tax, an aspect that has been particularly overlooked in recent discussions, but is essential if we are to consider the welfare impact on individuals of any changes in tax policy.

A proper analysis of the impact of any change in corporation tax revenue, particularly on the income distribution, requires a thorough understanding of the economic incidence of the tax; who ultimately carries the economic burden of this tax? Or to put it in the words of the 19th century economist, Edwin R.A. Seligman, ‘without a correct analysis of the incidence of a tax, no proper opinion can be formed as to its actual effect or its justice’ (Seligman, 1892).

The question of incidence is especially important in the context of corporate income taxes, due to the tax’ specific nature. The role of corporate tax in the tax system as a whole has been described as ‘unusual, since it is the only one of the main taxes whose subjects are not (...) creatures of flesh and blood’ (Snape, 2011). By logic, therefore the corporate income tax *must* ultimately fall on someone other than the company itself, be it owners (shareholders), suppliers (e.g. employees) or consumers. The Institute for Fiscal Studies (2011) argued it was ‘not meaningful’ to discuss the corporate income tax, without taking incidence into account.

2.2 Empirical evidence shows strong evidence of workers and consumers bearing a significant incidence of corporate income tax

There is a wide consensus in the academic literature on corporate tax incidence, that at least some part of the corporate tax is passed on to people other than the shareholders. For example, an OECD-paper (Milanez, 2017), reviews a number of empirical studies on corporate tax incidence, and find the tax burden on workers ranging from 30% to 400%¹⁵. Similarly, the Institute for Fiscal Studies argues that there are ‘good reasons for thinking that (...) a tax on corporate income will be shifted onto domestic workers in the form of lower wages (IFS, 2011). Our own review of the literature (table 2) finds a similar result.

The differences stem, as can be expected, from difference in assumptions made by the authors, (for example, regarding, capital and labour mobility), differences in the form of the corporate income tax being considered, and differences in the economies being studied, both geographically, its openness and over the time.

¹⁵ In particular, the result that labour can bear more than 100% of the corporate income tax may appear surprising. However, this derives from the fact, as noted earlier, that the corporate income tax can cause not just damage to the wages of workers, but also to the economy as a whole, reducing GDP due to reduced productivity, lower investment in innovation, etc, the impact of which may be to reduce wages, as e.g. McKenzie, (2017) has noted. In the long-run, as argued by Arulmapalam et.al (2010), ‘the cost to the home country labour force can exceed the tax revenue generated.’

Incidence on workers will also vary according to market conditions. For example, Felix' analysis (2007) suggests that 'differences in labor mobility across skill-level' may explain the tax incidence and that 'if high-skill workers are more mobile than low-skill workers, they may be able to avoid some of the corporate tax burden'. Fuest et.al (2017) notes that 'higher taxes reduce wages most for the low-skilled, for women, and for young workers.' Other authors have stressed the importance of the intensity of the competitive environment when determining incidence. For example, a consortium of researchers, when producing a paper for the European Commission (2015b), suggested that a greater incidence of labour tax (the principle can also be applied to corporate tax) will end up with workers in smaller, more open countries as there is less scope to increase prices to consumers, with the more general result that less competition in a market results in a higher incidence on labour.

Table 2: Empirical Evidence regarding the Economic Incidence on Labour

Authors	Period	Economic Incidence on Labour
Fuest, Peichl, Siegloch: “The incidence of corporate taxation and its implications for tax progressivity” (2017)	1993-2012	51%
Felix & Hines (2009): “Corporate Taxes and Union Wages in the United States” (2009)	2000	54%
Arulampalam, Devereux & Maffini: “The Direct Incidence of Corporate Income Tax on Wages” (2012)	1996-2003	49%
Mckenzie & Ferde (2017): “Who pays the corporate tax? Insight from the literature and evidence for Canadian provinces”	1981-2014	152%-385%
Desai, Foley & Hines: Labor and Capital Shares of the Corporate Tax Burden International Evidence (2007)	1989; 1994; 1999; 2004	45%-75%
Felix: “Passing the Burden: Corporate Tax Incidence in Open Economies” (2007)	1979-2002	400%
Ebrahimi & Vaillancourt: “The Effect of Corporate Income and Payroll Taxes on the Wages of Canadian Workers” (2016)	1998-2013	75%
Carrol: “Corporate Taxes and Wages: Evidence from the 50 States” (2009)	1970-2007	250%
Suarez Serrato & Zidar: “Who Benefits from State Corporate Tax Cuts? A Local Labour Markets Approach With Heterogeneous Firms” (2014)	1980-1990; 1990-2000; 2000-2010	30-35%
Felix: “Do State Corporate Income Taxes Reduce Wages?” (2009)	1977-2005	360%
Liu & Altshuler: “Measuring the Burden of the Corporate Income Tax Under Imperfect Information” (2013)	1982; 1992; 1997	40-80%

Source: OECD-Taxation Working Papers No. 32 - Milanez (2017) and additional studies

In addition to workers, consumers can also carry the tax burden in the shape of higher prices for goods and services. A key determinant in assessing how much of the burden of the tax is likely to be shifted to consumers, for any given product, is the extent to which consumers would be willing to change

their consumption pattern and buy the goods abroad or stop buying altogether. When consumers are more likely to switch products, the lower the likelihood of an increase of the tax incidence on consumers. In economic terms, this means the more elastic demand is, the less likely a company would be to increase its price, with in rare cases of perfectly inelastic demand, consumers bearing an increase to the corporate income tax in full (Australian Treasury, 2014). In addition, the issue of the intensity of the competitive environment, as noted above, applies to consumers, with less competitive market conditions allowing a greater pass through to consumers, and less absorption of the tax by workers. In terms of empirical studies, Ablett & Hart (2006) noted ‘there exists significant forward shifting of the tax onto consumers in the form of higher product prices.’

2.3 Increasing acknowledgement of incidence in public finance modelling

The likely incidence of corporate tax on workers and consumers is increasingly acknowledged by international organisations. The IMF’s Fiscal Affairs Department has argued that ‘workers, not shareholders, bear the real incidence of the corporate income tax’ (De Mooij and Keen, 2015). Similarly, the OECD, in 2012, described the corporate income tax as ‘one of the most distortive taxes’ for having ‘sizable adverse effects on labour use, productivity and capital accumulation’ (OECD, 2012).

Policymakers in the United States are increasingly responding to the academic consensus around incidence in terms of how they model the impact of corporate tax changes. The US Congressional Budget Office¹⁶, which had previously estimated that corporate income tax was entirely born by shareholders, announced in 2012 that they would in future allocate ‘75 percent of the federal corporate income tax to capital income and 25 percent to labour income’ in their methodological work (CBO, 2012). The US Treasury followed suit and from 2012 has included in their analysis the notion that the burden of the corporate income tax is partly shared by workers (Office of Tax Analysis, 2012). Finally, the US Congress’ Joint Taxation Committee stated in 2013 that ‘the burden of corporate income taxes falls largely on domestic individuals’ and ‘is not borne entirely by capital owners, and is instead shared between capital owners and labour’ (Joint Committee on Taxation, 2013).

2.4 Public discussion fails to acknowledge the importance of incidence

The risk is that whilst public debate remains uninformed about the importance of tax incidence, tax policy making will remain suboptimal in terms of its impact on employment and growth, if policymakers, either through ignorance or convenience ignore the importance of incidence. The frequent quote, ‘companies must pay their fair share of tax’ reiterates that idea that the full incidence of corporate tax is borne by companies, as well as, depending on context, ignoring that companies pay other taxes than the corporate tax and act as tax collectors.¹⁷

¹⁶ A federal agency that provides budget and economic information to the US Congress.

¹⁷ Next to paying the corporate income tax, businesses also pay VAT, social contributions and may be obligated to pay e.g. property and environmental taxes as well. An overview of EU-Member States’ tax revenue reveals that businesses were paying roughly 2 trillion of taxes

Underlining this point, the Institute for Fiscal Studies suggests that politicians may still promote the corporate income tax ‘for similar reasons that they are attracted to separate social security contributions for employers - because many voters perceive these to be taxes that fall on someone else’ (IFS, 2011).

Some organisations similarly dismiss the idea of incidence, despite the academic evidence outlined above. For example, the Tax Justice Network in its publication ‘Ten Reasons to Defend the Corporation Tax’ call the incidence argument ‘a hoax’ (Tax Justice Network, 2015). In addition, Oxfam noted that taxing companies is ‘one of the most progressive forms of taxation’ (Oxfam, 2014). Similarly, Eurodad (2017) dismissed the idea of a link between corporate taxes and the income of workers or consumer price levels.

The discussion in the EU would be helped by a greater analysis of incidence in official communications. For example, both the European Commission’s Communication on the digital tax (2018c) and, more worryingly, the accompanying 161-page impact assessment (2018d) do not contain the word ‘incidence’. For example, the European Commissioner in charge of taxation policy, Pierre Moscovici in a recent comment on corporate tax and corporate tax avoidance stated that ‘governments have to compensate for this loss by shifting the burden elsewhere – to citizens, workers or smaller, less mobile businesses’, not acknowledging that a great deal of the economic literature already shows that the burden of corporate tax is already partly borne by citizens and workers (European Commission, 2016b).

2.5 Even when shareholders bear the incidence – we should not assume they are all rich

Whilst much of the impact of the incidence of corporate taxes are borne by workers and consumers, some does remain with shareholders. However, we should remember that not all shareholders are rich.

While stock ownership was indeed for a long time predominantly present in the richest households, the patterns of stock ownership are changing. A US-wide survey of 2016 showed that nearly 52 percent of US families (directly or indirectly) owned stocks (Federal Reserve, 2016). Workers can e.g. indirectly hold stocks through occupational pension schemes. A 2017 report by PensionsEurope (2017) showed for example that pension funds hold €1.1 trillion in equity across Europe, covering more than 90 million members & beneficiaries.

in total in 2016 (European Commission, 2018a). An often-overlooked aspect is also the role of businesses as collectors of tax, i.e the legal requirement of businesses to send an amount of tax to their governments on behalf of others (‘legal remittance responsibility’). More information on this role can be found in the OECD-study by Milanez (2017).

2.6 Conclusions

This chapter has highlighted the importance of considering the economic incidence impact of a tax, rather than simply the legal incidence. This is particularly important for corporation tax, given that the final incidence cannot be on the corporation, but will ultimately fall on individuals either as shareholders, workers or consumers.

Evidence suggests that a significant proportion of any corporate tax is likely to fall on workers, and certainly a minimum of 30%, dependent upon the nature of both the final product market and factor (labour and capital) markets. Given we would also expect a significant proportion to fall on consumers through higher prices, it should be clear that only a limited proportion of the tax is falling on shareholders.

Public discussion or reporting of corporate tax issues rarely reflects the importance of incidence, and so the EESC can play a role in helping to improve the standard of discussion on these issues. For example, general statements about ‘the tax burden on business’ should be used carefully.

Most worryingly, the EU appears to be lagging behind the US in terms of its analysis of the economic incidence of tax in its analysis of new policy measures. For example, whilst the European Commission’s recent impact assessment on the digital tax did not contain the word incidence, the US congressional budget office and Treasury attribute the burden of increased business taxes in part to workers in its analysis. The EESC could call upon the Commission to ensure its analysis and modelling similar reflects the real economic burden of new taxes.

3. The economic impact of corporate tax changes

3.1 Impact of corporate tax changes on investment

Taxes, while necessary to provide for public services, are generally considered to distort private decisions and reduce economic efficiency (see for example, OECD¹⁸). The founding father of economics, Adam Smith¹⁹ argued that taxes can stifle the incentive of individuals to work and provide goods and services, noting that taxes ‘may obstruct the industry of the people, and discourage them from applying to certain branches of business which might give maintenance and employment to great multitudes.’

This chapter looks more closely at the economic impact of corporate taxation by using both theoretical considerations and empirical evidence. First, we set out how changes in corporate tax rates are expected to affect investment. Second, we evaluate how changes in investment from such corporate tax changes are expected to impact on overall growth and extend this to employment and public revenue. We also consider the impacts of corporation tax in comparison to other taxes, as well as the specific impact on small and medium-sized enterprises (SMEs).

Economic theory

While there are many factors that can affect investment decisions, such as access to finance, economic prospects and regulation, the European Commission²⁰ notes that ‘the level of taxation has a significant influence.’

Whether or not a company invests in a certain project crucially depends on both the cost and the expected return of that project. Only when the expected return of a project exceeds its cost by a sufficient margin, investors will be willing to invest in it (Hynes and O’Connor, 2014). High corporate taxes reduce the after-tax return of an investment, thus making fewer projects economically viable to be undertaken (Johansson et al., 2008; Commission, 2015). It follows that by reducing corporate tax rates, more investment opportunities will become profitable for companies to undertake.

In more technical terms, taxes affect investment choices as they drive a ‘wedge’ between the cost of capital faced by companies (i.e. a company's cost of raising debt and/or equity funding) and the net return on a project required by investors. Without taxation, the investor earns a rate of return equal to that earned on the project itself. With taxation, the two rates can differ as the net return of an investment project is reduced (King & Fullerton, 1983; European Commission, 2015c). By lowering the corporate tax rate more investment projects will satisfy the required rate of return of the investor, and will therefore be made, in turn, leading to a broader tax base.

¹⁸ See Arnold (2008).

¹⁹ Reference in Pennsylvania State University (2005).

²⁰ European Commission (2015). ‘Tax Reforms in EU Member States: 2015 Report.’

Lower corporate tax rates cannot only stimulate investment which would have not taken place otherwise, it can also increase the likelihood of hosting foreign direct investment (FDI) which would have taken place anyway, but in a different country. FDI, which signifies investment of companies or individuals conducted outside their country of residence, is an important source of capital for many countries. It is generally considered particularly desirable for the host economy (Spengel, 2017) given it is characterised by a long-term intention and controlling interest of the investor which goes beyond pure capital flows and may entail the transfer of knowledge and technology. Moreover, a key benefit of attracting inward FDI is increased competition, which may in turn stimulate domestic productivity growth (Drifffield, 2002).²¹

It is however important to note that the corporate tax rate is only one factor which affects the level of investment, which also depends on issues such as financial constraints, economic prospects and regulation (Hynes and O'Connor, 2014; Commission, 2015b). Thus, even a comparatively low corporate tax cannot compensate for an otherwise weak and unattractive business environment (OECD, 2008). Moreover, as the OECD²² points out, the degree of openness of the economy has an important impact on investment, with more open economies with mobile capital likely to suffer more from the expected negative impact of an 'excessively' high corporate tax. Finally, as we consider elsewhere, next to the headline tax rate itself, depreciation allowances, debt interest allowances and other tax rules will change the optimal investment in capital by companies (Hynes and O'Connor, 2014; Commission, 2015b).

Empirical findings

Empirical studies on the link between corporate taxes and investment generally confirm the negative relationship that economic theory predicts, despite varying widely in their approach. For example, Djankov et al. (2008)²³, who distinguish between the corporate tax rate facing start-ups in their first year and that of more mature companies, find that a 10 percent increase in the effective corporate tax rate for start-ups decreases the investment-to-GDP ratio by 2 percentage points. Similarly, a study from Bond and Xing (2013a, 2013b) also suggests negative effects on long-run capital accumulation, noting that their main findings are 'strikingly consistent' with the basic economic theory of corporate investment which predicts a negative relationship.²⁴ Further studies which point to such a negative

²¹ In a UK study, the author suggests that in industries where the foreign owned sector has a demonstrable productivity advantage over the domestic sector, domestic firms, faced with a more efficient competitor, seek to improve efficiency. The results show that the domestic sector was able to assimilate about 15% of any productivity growth generated by the foreign sector, but with a time lag.

²² Johansson et al. (2008).

²³ The study uses data for mid-sized firms in 85 countries in 2004.

²⁴ The authors evaluate the relationship between aggregate capital accumulation and the user cost of capital at both industry and firm level. In their 2013a publication, the authors find a long-run user cost elasticity of close to -1 at industry level for 14 OECD countries during the period 1982-2007. Their 2013b publication, with data covering 31,740 domestic independent firms and 10,666 subsidiaries of multinational companies in the manufacturing sector from 7 European countries over the period 1999-2007, again finds that elasticities are not significantly different from -1 also at firm level.

relation between corporate taxes and investment include Hall and Jorgenson (1967)²⁵, Hassett and Hubbard (2002)²⁶, Moore (2014)²⁷, Federici and Parisi (2015)²⁸.

Other studies look specifically at the link between corporate tax changes and FDI, again underlining the negative relationship posited by economic theory. For example, a literature review referred to by the OECD (2008) and carried out by Mooij and Ederveen (2005) shows that most studies report a negative relationship between taxation and FDI, even though estimates of the responsiveness of FDI to the tax (i.e. tax elasticity) vary widely depending on the approach used in the study.²⁹ The authors synthesis of the individual studies suggests that a one percentage point increase in the tax rate on FDI leads to an average decline of FDI by 3.7%.³⁰

Furthermore, Mooij and Ederveen illustrate how different characteristics in the study design may impact on elasticity values. First, studies looking at location decisions are found to produce smaller elasticities than studies using FDI values, which, according to the authors may illustrate that the amount of capital invested is more responsive to taxes than the location decisions themselves. Second, there is evidence that studies using the effective tax rate produce larger elasticities compared to studies employing statutory tax rates. Finally, relatively large elasticities are found in studies using cross-section data compared to those using panel studies and time series models.

3.2 Impact of corporate tax changes on economic growth

The potential of corporate tax increases to discourage investment is regarded by the OECD and the IMF³¹ as a key reason for why corporate taxation can negatively impact economic growth.³² Different empirical studies substantiate such a negative relationship between corporate taxes and economic growth.

For example, Lee and Gordon (2005)³³ show that cutting the corporate tax rate by 10 percentage points can raise annual growth by 1-2 percentage points. Similarly, in a US study, Mertens and Ravn

²⁵ The paper shows that depreciation allowances and investment credits can stimulate investment.

²⁶ The authors review a number of empirical studies in the 1990s and early 2000s, noting that ‘recent empirical studies appear to have reached a consensus that the elasticity of investment with respect to the tax-adjusted user cost of capital is between -0.5 and -1.0.’ They however caution against moving from such microeconomic evidence to aggregate predictions on capital formation due to little knowledge about the general-equilibrium effects of major policy changes.

²⁷ The study focuses on the 2006 corporate tax reform in Belgium and finds evidence that small and medium-sized manufacturing firms reacted to the reform by expanding their investment activity. The study’s benchmark specification implies an increase of 3.7% for the investment rate of small firms, whereas medium-sized firms increased their investment rate by 3.0% between 2006 and 2008.

²⁸ The paper uses Italian firm-level panel data-set over the period 1994–2006, clearly showing that taxes distort firm-level investment. The authors show that a one-percentage-point increase in the average tax rate is associated with a -0.112 percentage point decrease in the investment/fixed asset ratio, while a one-percentage-point increase in the marginal tax rate is associated with a -0.017 percentage point decrease.

²⁹ The majority of elasticities is found to be between -5 and 0.

³⁰ The study uses estimates from 31 existing empirical studies in order to develop a meta sample of tax elasticities. Considering the different approaches in empirical studies, the authors regress the elasticities provided by the literature to the underlying characteristics of the studies used.

³¹ See Johansson et al. (2008) and IMF (2014).

³² Next to reducing investment incentives, corporate taxes are also considered to be harmful to growth by hampering productivity improvements, while introducing a bias toward debt financing (IMF, 2014).

³³ The authors use cross-country data for 70 countries for the period 1970-1997. They note that the significant effect of the tax cuts on growth remains even after controlling for other factors.

(2012)³⁴ find a significant impact on economic output from cutting the average corporate income tax rate, noting that a one percentage point cut raises real GDP per capita by 0.4% soon after the tax cut and by up to 0.6% after one year.

In fact, while the OECD³⁵ underlines that all taxes have the potential to discourage growth given their adverse effect on household saving, labour supply, human capital investment, as well as on companies' decisions to produce, create jobs, invest and innovate, its analysis on tax structures has found corporate taxes to be the most harmful form of taxation to economic growth (see figure 5). In the OECD tax ranking, corporate taxes are followed by personal income taxes, consumption taxes, and then taxes on immovable property which are found least detrimental to growth. The latter taxes are found to be least harmful exactly as they are less likely to affect the decisions of households and firms.

In view of this tax hierarchy, the European Central Bank (2017) notes that 'shifting [...] the tax burden to less distortive taxes can exert positive effects on output growth without burdening public budgets.' Similarly, the OECD³⁶ recommends a 'revenue neutral growth-oriented tax reform', where governments shift part of their revenue base from income taxes to taxes that are less distortive while keeping their overall public revenues unchanged.

Whilst such a shift can thus boost growth, the OECD also refers to the importance of taking different national circumstances into account, noting that one must assess both a country's current tax system and the areas (e.g. employment, investment and productivity growth) in which its current economic performance is relatively poor. Moreover, the positive impact on growth from adjusting taxes may also be subject to diminishing returns, which means that a tax cut from a high rate may boost growth to a larger extent than an equivalent cut from a lower rate.

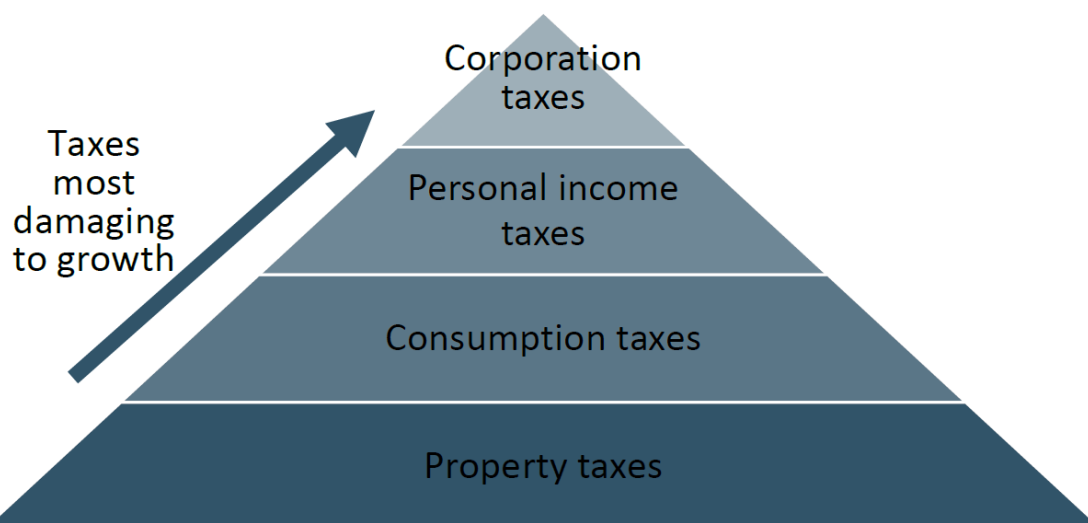
³⁴ The scholars develop an estimator which uses narratively identified tax changes as proxies for structural tax shocks and apply it to quarterly post-World War II US data.

³⁵ See Johansson et al. (2008) and Arnold (2008).

³⁶ See Arnold (2008).

Figure 5: Corporate taxes found most harmful to growth by the OECD

OECD hierarchy of taxes



Source: OECD's hierarchy of taxation. Graphical illustration by Hynes and O'Connor (2014).

Finally, there has recently also been some discussion on the introduction of turnover taxes, in particular triggered by the European Commission's proposal to levy an 'interim' digital services tax (DST) on gross revenues (i.e. turnover).³⁷ A recent Ernst & Young (2018) global tax briefing notes that 'a host of converging factors (many of which are deeply political) mean that it is quite possible that many nations – both in and out of the EU – will move forward and adopt independent turnover taxes of some form in the short to medium term.'

Again, we need to consider the issue of tax incidence. As is the case with the corporate tax, part of a turnover tax would likely fall on consumers and workers in form on higher prices and lower wages. However, another part of the burden would also be borne by corporates and the owners of capital. As with corporate taxes, turnover taxes reduce the after-tax return of investment projects, making fewer projects economically viable to be undertaken. Consequently, investment activity and economic growth can be expected to suffer.

There are more specific arguments against the introduction of taxes on turnover. Not only would turnover taxation break with globally established norms to tax profits, but turnover taxes, based on revenues, would also be particularly detrimental for start-ups. Since companies often record losses in their first years, and therefore get tax relief from corporate taxation, a turnover tax would first and foremost penalise start-ups and potentially hinder them from becoming viable businesses at a later stage. The European Commission itself noted in a recent press release³⁸ that turnover taxes, which were prevalent in Europe in the past and have subsequently been replaced by the common Value

³⁷ See European Commission, 'Proposal for a Council Directive on the common system of a digital services tax on revenues resulting from the provision of certain digital services', SWD(2018) 81 - SWD(2018) 82.

³⁸ European Commission, 'Fair Taxation: Commission proposes final technical measures to create a future fraud-proof EU VAT system Brussels', Press release from 25 May 2018.

Added Tax (VAT) in the late 1960s, ‘distorted competition and hindered the free movement of goods’ between countries.

3.3 Impact of corporate tax changes on employment

A further issue relates to how corporate tax changes can affect employment. Where additional investment from a corporate tax cut is complementary to workers skills, it can be expected to increase demand for workers due to an increased need to operate that capital. Where additional investment is labour substituting, it may still have an overall positive impact on economy-wide employment due to increased productivity and lower prices which ultimately boosts the demands for other domestic products and services. This may happen with a time lag. Auerbach (2018) notes that one would not expect the increase in labour demand from a corporate tax cut to occur immediately in competitive economies as such an increase would first require a surge in firm’s labour productivity or boost in demand for their products.

However, as it is the case with investment, the impact of tax cuts on employment (and growth) will also depend on wider economic and policy conditions, with some authors suggesting that significant effects of tax cuts on growth and employment may only be expected when the corporate tax rate is initially relatively high (Carmignani, 2018).

While numerous studies look at the relationship between corporate taxes and investment, the empirical literature on the effect on employment is scarcer. Ljungqvist and Smolyansky (2016) who compare variations in corporate income tax rates across US states over the period 1970 to 2010, find that a one percentage-point *increase* in the top marginal corporate income tax rate does indeed reduce employment by 0.3%-0.5% and income by 0.3%-0.6%, measured relative to neighbouring regions in adjacent states. However, the authors did not identify a significant effect on employment and wages for tax *decreases*, at least during ‘normal’ economic times. When implemented during recessions, tax cuts were found to lead to ‘sizeable increases’ in both employment and income, suggesting that corporate tax cuts could be particularly effective during economic downturns.

3.4 Impact of corporate tax changes on public revenues

Another question relates to how corporate tax changes will impact on revenues. Here one can distinguish between both corporate tax revenues and overall public revenues.

Corporate tax revenues

First, regarding corporate tax revenues, while one might generally suspect that a *high* tax rate produces *high* tax revenues, the OECD³⁹ argues that this is not necessarily the case because, with open economies, companies can choose to locate their activities in low-tax countries. Moreover, as noted

³⁹ See Johansson et al. (2008).

above, a high corporate tax rate can hamper business activity by rendering certain investment projects unprofitable, thereby lowering the tax base and thus revenue collection.

This underlines the fact that revenues from corporates do not just depend on the tax rate, but on many other factors, including the breadth of the tax base, enforcement efforts by public tax authorities and curbs on tax avoidance, economic conditions and in turn firm profitability, as well as the share of the corporate sector in the economy (Clausing, 2007).

In line with such theoretical considerations, empirical analysis and available data suggests that while lowering the corporate tax rate may not necessarily boost revenue collection from corporates, such tax cuts must not necessarily lead to significant shortfalls in public finances.

For example, Mertens and Ravn (2012) in a US study find that cuts in corporate taxes do not have a significant impact on corporate tax revenues because the tax base may increase. Cuts in corporate taxes appear thus to be ‘approximately self-financing’, according to the authors. More specifically, the study shows that the tax cut induces a sufficiently large increase in the tax base so that corporate income tax revenues are found to decline only very slightly in the first quarter and lead to a slight, but insignificant surplus thereafter. Such a finding is in line with available OECD data (mentioned in part 1) which shows that despite a general decline in corporate tax rates, the share of average corporate tax revenue has not declined over the last fifty years.⁴⁰

In a different study of 29 OECD countries, Clausing (2007)⁴¹ demonstrates an inversely U-shaped relationship between tax rates and corporate tax revenues, where, after a certain point, tax revenues start to fall as the tax rate increases.⁴² The author suggests that reasons for such a relationship may include tax increases leading to a real reduction in corporate economic activities due to the tax disincentive with higher rates, reductions in real investment in high-tax locations in favour of investment in low-tax locations, an increased incentive for shifting income across locations through transfer pricing, or increased tax avoidance effort even by domestic firms. Finally, additional analysis from Clausing indicates that smaller, more open economies will have lower revenue-maximizing rates compared to larger or more closed economies. According to the author, this is consistent with the idea that the former should face a more elastic capital supply (i.e. in the case of smaller, more open countries capital inflow may be reduced more strongly due to the tax).

⁴⁰ It is however important to mention that the reduction in corporate taxes came along with a general broadening of the tax base (e.g. reduced investment tax credits, less generous loss offset rules, and limitations on interest deductibility and depreciation), which likely cushioned some of the effect on revenues.

⁴¹ The paper covers a 24-year period from 1979 until 2002.

⁴² The author however cautions that the 33% constitute an estimate for a sample of countries and years studied, which does not need to imply that it is also the revenue maximizing tax rate for any particular country and any particular time which depends on that country's individual circumstances.

Overall public tax revenues

Second, when it comes to overall public revenues, lowering corporate tax rates must thus also not necessarily lead to revenue shortfalls. This is first and foremost the case in those situations where a corporate tax cut does not reduce corporate tax revenues as outlined above.

However, even in such situations where corporate tax revenues do fall, the final outcome must not necessarily be a reduction in overall corporate tax revenues. In fact, by spurring economic growth, investment and eventually employment, lowering the corporate tax rate may in fact have a positive effect on overall public revenue, or at least lead to a situation where some of the foregone revenue from the tax cut is recuperated. The Laffer Curve, which states there is a revenue-maximising tax rate beyond which revenue starts to decline as economic activity is discouraged, captures this insight (Fullerton, 1980; Zuluaga, 2016).

3.5 Impact of corporate tax changes on SMEs

A final question is whether small enterprises are affected differently from corporate tax changes compared to large ones.

Small and medium-sized enterprises (SMEs)⁴³ are an important part of the economy, representing over 95% of all companies and making up a large part of employment (at least 60% in all but four OECD countries)⁴⁴ and value-added (between 55 to 75% in most countries), according to the OECD⁴⁵.

It is important to note that the taxation of SMEs under personal and corporate taxes usually depends on its business form, with unincorporated SMEs typically taxed only at the personal level, while incorporated SMEs are first taxed at corporate level and then again at personal level once profits are distributed. In addition, social security contributions may apply to SME income.

In cases where corporate taxes apply, most OECD countries apply a single statutory corporate income tax (CIT) rate regardless of company size, while fourteen countries have lower corporate income tax rates for small businesses below a prescribed threshold, with the largest differences between the basic and small business rates found in Canada, France, South Africa and the United States. Small business rates reduce the corporate tax rate by an average of 4 percentage points across the whole group of countries considered, and by ten percentage points across countries with a small business rate (OECD, 2015).

When it comes to the impact of corporate tax changes specially on SMEs, the literature is sparse, with one OECD study⁴⁶ suggesting that there is a negative impact of corporate taxes on firm investment

⁴³ While definitions vary, a commonly-used categorisation for SMEs is provided by the European Commission (Recommendation 2003/361/EC of 6 May 2003), stating that SMEs are ‘enterprises which employ fewer than 250 persons and which have an annual turnover not exceeding EUR 50 million, and/or an annual balance sheet total not exceeding EUR 43 million’.

⁴⁴ These four are Australia, France, India and Luxembourg

⁴⁵ Report on ‘Taxation of SMEs in OECD and G20 Countries’, OECD Tax Policy Studies, No. 23, 2015.

and on the rate of productivity growth regardless of firm size. While the study suggests that firm size per se does not matter much in this regard, it finds that older firms respond more strongly to corporate taxation than younger ones. One possible explanation is that young firms are generally less profitable than older firms and thus have a smaller tax base which, in turn, reduces the negative impact of corporate taxation.

Whilst the level of taxation, including corporate taxation, is clearly a key issue for SMEs, it is also clear that other factors such as regulatory requirements and the cost of tax compliance, as well as SMEs potential to access finance are of specific importance to smaller enterprises and to their ability to innovate and to invest in the economy.

3.6 Conclusions

This chapter draws on theoretical and empirical literature to illustrate that taxes, while necessary to provide for public services, distort private decisions and reduce economic efficiency, which may ultimately lead to weaker investment and economic growth. As the OECD hierarchy of taxes clearly underlines, corporate taxes are considered particularly harmful to economic growth, followed by personal income taxes, consumption taxes and property taxes in the ranking. The chapter further outlines that as a result of weaker economic growth, corporate taxes increases may, depending on the circumstances of the economy at the time, ultimately also have negative repercussions on employment creation and overall public revenue collection. Finally, the chapter ask the question whether enterprises of different sizes are affected to a different extent by corporate tax changes, citing some evidence suggesting that there is a negative impact on firm investment and productivity regardless of firm size, while also emphasizing that a variety of different factors other than just tax rates have an impact on companies' ability to innovate and to invest in the economy.

⁴⁶ Reform from Schwellnus, C. and J. Arnold, 'Do Corporate Taxes Reduce Productivity and Investment at the Firm Level?: Cross-Country Evidence from the Amadeus Dataset', OECD Economics Department Working Papers, No. 641, 2008.

4. Event study on the economic impact of corporate taxation

4.1 Approach of the study

In this section we assess how actual incidences of countries introducing changes in corporate tax rates have impacted on their investment and public revenues (so-called event study).

In more detail, we have identified 98 significant changes (events) in corporation tax in 41 EU and OECD countries, between 1981 and 2014, measured in both headline statutory⁴⁷ and effective rates⁴⁸ (independent variables). For each of the events identified, we evaluated the changes in investment, FDI, and both corporate and overall public tax revenue (dependent variables) in both the following 2 and 5 years (when available).

We defined an event as a change of +/- 5% for the statutory rate or +/- 2.5% for the effective rate, with the change accumulated in period of up to 3 years. These thresholds provide a sufficiently high hurdle for the tax changes to potentially have a meaningful impact on the economy and yet still yield a sufficient number of events. The time period considered was 1981 to 2014 for the statutory tax rate and 1998 to 2014 for the effective rate, given data availability. In addition, we specified that there must be a gap of at least 3 years between events in order to avoid large cumulative effects of tax changes on the dependent variable⁴⁹.

We also adjusted the change in national rates, against the change in the OECD average during the period in question, but this adjustment did not have a significant impact on the result compared to the unadjusted series.

When examining the impact of corporate tax changes on investment, FDI, and both corporate and overall public revenue (dependent variable), we calculated the changes against the average of these variables in the 5 years immediately prior to the event given volatility in these data, particularly for tax revenue and investment.

Next to assessing whether the corporate tax rate has a positive or negative impact on the dependent variable (i.e. the direction of the relationship), we also evaluated how closely the data are fitted to the regression line by reporting the corresponding R-squared ('coefficient of determination'). R-squared ranges between 0 to 1, where values closer to 0 represent a poor fit, while values closer to 1 represent a perfect fit. In order to verify that the reported R-squared is indeed different from zero and not just different as the result of pure chance (i.e. the significance of the result), we test each case against the null hypothesis that the correlation coefficient is in fact zero. We do so by calculating the relevant p-

⁴⁷ The 'basic' (non-targeted) top rate is used here.

⁴⁸ The Effective Average Tax Rates (EATR) are calculated via the use of the Devereux & Griffith framework (see ZEW (2014)). This calculation is used by the European Commission.

⁴⁹ In addition, to further avoid that years following the event impact on our dependent variables, we only selected events where in the following 3 years no further change of the same magnitude took place (i.e. change compared to the last year of the event). In order to avoid that years preceding the event impact on our dependent variables, we only selected events where in the preceding 3 years no further change of the same magnitude had taken place.

value, which also ranges between 0 and 1, with a small p-value ($\leq 0.05/0.1$) indicating strong evidence against the null hypothesis, and thus in favour of the validity of the result.

4.2 Data sources

For statutory and effective corporate tax rates we used the OECD Tax Database and data from the European Commission (DG TAXUD). Data on investment and overall public revenues are from the IMF April 2018 World Economic Outlook, while we used United Nations Conference on Trade and Development (UNCTAD) data for FDI. For corporate tax revenues, we used OECD data. Table 3 summarizes our approach.

Table 3: Key variables and source data

Independent variables (IV)	Dependent Variables (DV)
% Change in effective rate (year=t) <i>Source: European Commission (DG TAXUD) – Data on Taxation Webpage</i>	% Change in investment/GDP (avg. t+1, t+2) <i>Source: IMF, World Economic Outlook (April 2018)</i>
% Change in headline rate <i>Source: OECD Tax Database & European Commission (DG TAXUD) – Data on Taxation Webpage</i>	% Change in investment/GDP (avg. t+1,2,3,4,5) <i>Source: IMF, World Economic Outlook (April 2018)</i>
% Change in effective rate (-change OECD average) <i>Source: European Commission (DG TAXUD) – Data on Taxation Webpage</i>	% Change in FDI inflows/GDP (avg. t+1, t+2) <i>Source: UNCTAD, Data Center</i>
% Change in headline rate (-change OECD average) <i>Source: OECD Tax Database & European Commission (DG TAXUD) - Data on Taxation Webpage</i>	% Change in FDI inflows/GDP (avg. t+1,2,3,4,5) <i>Source: UNCTAD, Data Center</i>
	% Change in corporate tax revenue/GDP (avg. t+1,2) <i>Source: OECD – Revenue Statistics</i>
	% Change in corporate tax revenue/GDP (avg. t+1,2,3,4,5) <i>Source: OECD – Revenue Statistics</i>
	% Change in overall public revenue/GDP (avg. t+1,2) <i>Source: IMF, World Economic Outlook (April 2018)</i>
	% Change in overall public revenue/GDP (avg. t+1,2,3,4,5) <i>Source: IMF, World Economic Outlook (April 2018)</i>

4.3 Limitations of the study

Before presenting the results, it is important to highlight some challenges that arise when attempting to empirically measure the economic impact of tax policy changes.

Firstly, tax policy changes are unlikely to be random events but may be influenced by prevailing economic conditions and other factors. As a result, correlations between tax changes and economic outcomes are likely to reflect to a certain extent unobserved or omitted variation in economic conditions (Ljungqvist and Smolyansky (2016)). Some authors have thus attempted to filter out those tax changes that were taken in response to other factors likely to affect economic output ('endogenous' tax changes).⁵⁰ For example, Romer and Romer (2010) published a study in which they use narrative records in order to identify only those tax changes that can legitimately be used to measure the macroeconomic effects that follow from those changes ('exogeneous' changes).⁵¹

Secondly, the analysis is made more complicated as it is impossible to observe counterfactual outcomes, i.e. we cannot be sure how economic conditions would have changed if a given tax change had not taken place (see Ljungqvist and Smolyansky (2016)). A related point is made by Hassett and Hubbard (2002) who note that 'the tendency for a number of aggregate variables to move together over the business cycle makes it difficult to isolate effects of individual fundamentals on investment using time-series data'. They further note that 'even if investment is very responsive to tax policy, it might appear not to be in the aggregate data, since so many other important determinants of investment are moving over the business cycle as well.' For such reasons it is key to additionally consider microdata evidence as the scholars conclude, and which, in the study at hand, is included in section 3.

Finally, it is important to note that, due to data availability, we used overall investment figures which include both public and private investment. This has the limitation that one would expect only private investment to be influenced by the corporate tax rate. However, given that private investment makes up the bulk of investment (86% in 2017 in the EU), total investment can be seen as a reasonable proxy.

4.4 Results – descriptive statistics

For the statutory tax rate, we have identified 61 separate events when there was a significant change in the statutory corporate tax rate (52 due to reductions, 10 due to increases), and for the effective tax rate 37 events (31 due to cuts, 6 increases).

⁵⁰ An example for such endogenous changes would be a tax cut made in response to policymakers forecasting a recession.

⁵¹ For instance, the authors classify tax changes taken by the government to deal with an inherited budget deficit or to achieve a long-term goal such as raising potential growth as exogeneous. In their study, which covers the US post-war period (data from 1945-2007), they find that an exogeneous tax increase of one percent of GDP lowers real GDP by almost 3%. Moreover, they show that using broader measures of tax changes which do not filter out other factors lead to substantially smaller effects on economic output, concluding that a failure to take account of the reasons for tax changes can lead to biased estimates of their macroeconomic impact.

If we were to use the same 5% threshold for the effective rate, we would get 19 events, the equivalent to 1.1 events per year, well below the 1.8 events/year of the statutory tax rate at the same 5% threshold. Thus, significant changes in headline rates have been more frequent than in effective rates, suggesting that either that headline rate changes are easier to engineer (with allowances or other rules acting as a drag on the change in the effective rate), or that policy makers sometimes compensate for changes in headline rate changes by reducing allowances.

For the *statutory* tax rate, events where we identified the largest absolute changes were:

- Austria (1988-1989), -25 pp;
- Hungary (1993-1995), -22 pp;
- Sweden (1989-1991), -22 pp;
- New-Zealand (1987-1988), -20 pp;
- Cyprus (2002-2003), -18 pp.

For the *effective* tax rate, the most significant events were:

- Cyprus (2002-2005), -16.3 pp;
- Greece (2009-2010), -9.5 pp;
- Turkey (2005-2006), -8.9 pp;
- Austria (2004-2005), -8.2 pp;
- Romania (2003-2004), -8.0 pp.

4.5 Results – econometric analysis

Our findings of how corporate tax changes impact on countries' investment and public revenues are discussed in the following, with key results displayed in form of scatter graphs.

Between the *statutory* corporate tax rate and the dependent variables (investment, FDI and public revenues) we do not find statistically significant relationships.⁵² However, for the *effective* tax rate, we do find stronger relationships with the dependent variables, a number of which are statistically significant (table 4). This reinforces the point that it is the effective tax rate which more adequately captures a company's tax burden due to its wider scope compared to the statutory rate.

Given, the above observations, the remainder of the study discusses only our findings related to the *effective* tax rate.

⁵² R-squared statistics range only between 0.0001 and 0.0492, indicating a very weak relationship.

Table 4: Significance test between effective corporate tax rate and dependent variables

Variable	R-squared	Degrees of freedom (N-2)	p-value	Significant at $\alpha = 0.05$	Significant at $\alpha = 0.1$
Change in investment (t+1,t+2)	0.133	35	0.027	Yes	Yes
Change in investment (t+1,2,3,4,5)	0.082	28	0.125	No	No
Change in FDI (t+1,t+2)	0.079	34	0.096	No	Yes
Change in FDI (t+1,2,3,4,5)	0.194	25	0.022	Yes	Yes
Change in corporate tax revenue (t+1,t+2)	0.052	31	0.202	No	No
Change in corporate tax revenue (t+1,2,3,4,5)	0.000	22	0.952	No	No
Change in overall revenue (t+1,t+2)	0.015	34	0.480	No	No
Change in overall revenue (t+1,2,3,4,5)	0.126	27	0.059	No	Yes

Source: Authors own calculations. Data from OECD, European Commission, IMF, UNCTAD.

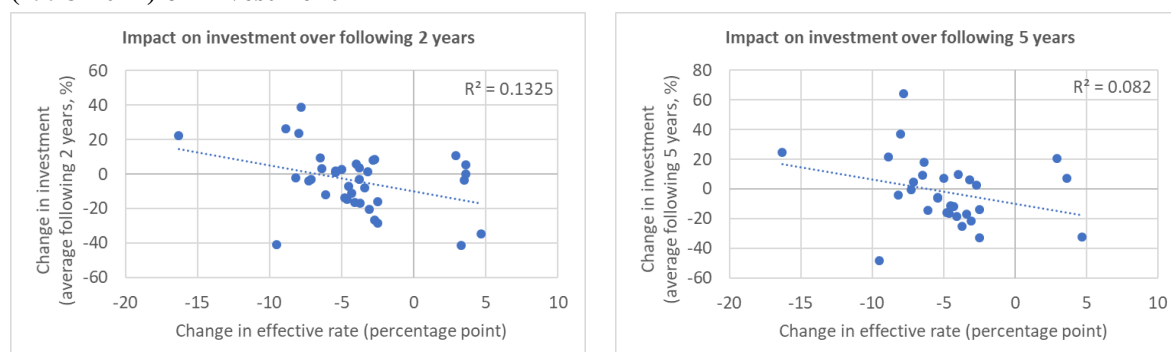
a) Investment and the effective corporate tax rate

Our results indicate that decreases in the effective corporate tax rate are associated with a moderate increase in the investment share in the following two years. In other words, we find a slight negative relationship between changes in the effective corporate tax rate and subsequent changes in investment as a share of GDP (figure 6).⁵³

This is particularly significant given the overall trend of reduction in global rates during the period which means the impact of any given tax rate reduction on investment will be weakened as other countries also reduce theirs.

⁵³ R-squared indicates with 0.13 a limited, but still statistically significant relationship for investment/GDP changes two years after the tax event. For changes five years after the event, R-squared is only 0.08 and does not pass our test for statistical significance. As discussed in the previous section, this underlines the important impact of other factors than only the corporate tax rate on investment.

Figure 6: Impact of a significant changes in the effective corporate tax rate of OECD economies (1998-2014) on investment

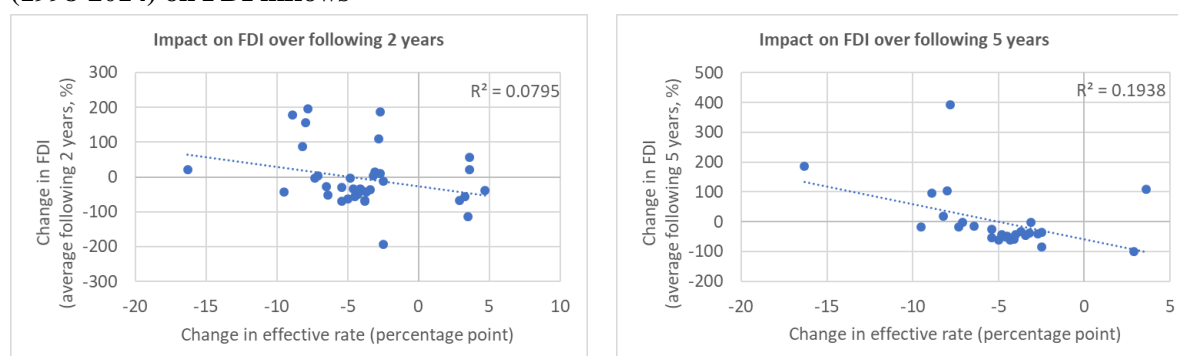


Source: European Commission & IMF.

b) FDI inflows and the effective corporate tax rate

Similarly, we find that a reduction in the effective corporate tax rate comes along with higher FDI inflows in the following years. It appears that the negative impact of corporate tax increases becomes stronger over time, with FDI inflows decreasing more strongly in the period five years after the event, compared to the two-year period (figure 7).⁵⁴

Figure 7: Impact of a significant changes in the effective corporate tax rate of OECD economies (1998-2014) on FDI inflows



Source: European Commission & UNCTAD.

c) Corporate tax revenues and the effective corporate tax rate

Coming to the impact on public finances, it appears that reducing the effective corporate tax rates has no significant impact on corporate tax revenue collection (figure 8).⁵⁵ This is clearly significant given the normal expectation would be that a lower rate would lead to lower revenue.

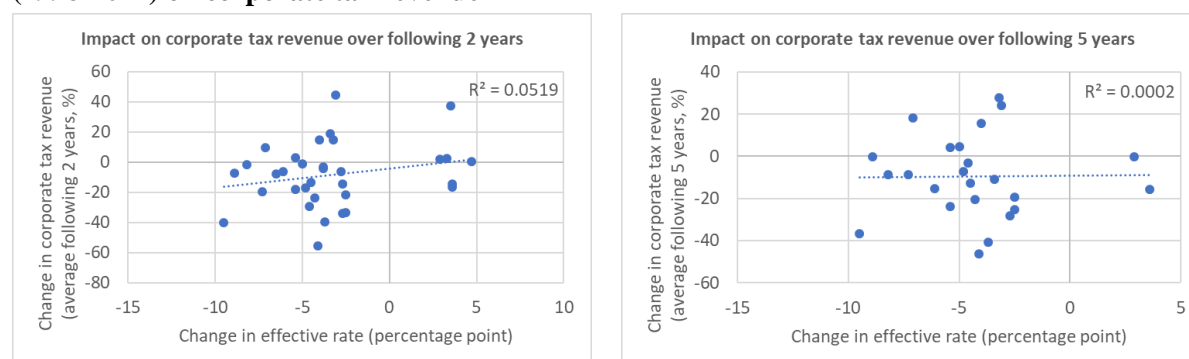
⁵⁴ The slope of the linear trend line is -11.9 for the 5-year horizon, compared to -5.5 for the 2-year horizon. This is underlined by the fact that the trend line better fits the data at a 5-year horizon (R-squared of 0.19 compared to 0.08 two years after the event) and that there is a significant negative relationship between the tax rate and FDI at a 5-year horizon for $\alpha = 0.05$ ($r(25) = 0.19$, $p = 0.022$), but only for $\alpha = 0.1$ at a 2-year horizon ($r(34) = 0.08$, $p = 0.096$).

⁵⁵ While there appears to be a slight positive relationship between corporate tax changes and corporate tax revenues two years after the event, R-squared with 0.05 too low to be statistically significant.

Moreover, in six cases, a reduction in the effective corporate tax rate in fact led to an increase in corporate tax revenues in the following two years (France, 1998-2001; Denmark, 1998-2001; Poland, 2003-4; Slovakia, 2003-4; Hungary, 2003-6; Estonia, 2004-7).

For the period five years after the event, we also do not find any impact of a corporate tax cut on corporate tax revenues.

Figure 8: Impact of a significant changes in the effective corporate tax rate of OECD economies (1998-2014) on corporate tax revenue

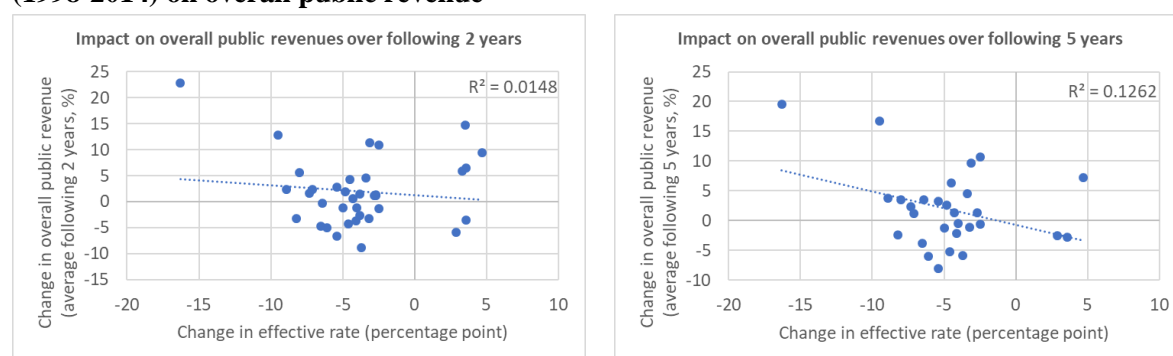


Source: European Commission & OECD.

d) Overall public revenues and the effective corporate tax rate

Most significantly, while a corporate tax cut does not lead to statistically significant falls in *corporate* tax revenues, for *overall public* revenues our results even reveal some tentative evidence that a reduction in the effective tax rate may actually increase overall public revenue on a 5-year horizon⁵⁶ (see figure 9). This highlights the broader tax contribution that companies make, beyond corporation tax, for example by increasing employment and hence income tax payments.

Figure 9: Impact of a significant changes in the effective corporate tax rate of OECD economies (1998-2014) on overall public revenue



Source: European Commission & IMF.

⁵⁶ While R-squared is with 0.12 not particularly strong, it passes our test for statistical significance at $\alpha = 0.1$, but not at $\alpha = 0.05$. For a 2 year horizon, the R-squared is not statistically significant.

4.6 Conclusions

Our study of the behaviour of investment and tax revenue following significant changes in corporate tax rates in OECD economies in recent years support a number of the empirical findings outlines in chapter 3. Whilst many factors impact on investment and public revenues, which means that the tax is certainly not the dominant influence on these outcomes, the following conclusions can be drawn:

- Our findings suggest that OECD economies that have reduced their effective corporate tax rates in recent years have seen increases in investment in the following years, with the positive impact on investment stronger over a 5-year period than a 2-year period.
- Reductions in corporate tax rates do not appear to have led to falls in *corporate tax* revenue collection, with six incidences where a cut in the effective corporate tax rate in an OECD economy actually led to an increase in corporate tax revenues.
- When we consider the broader impact of a corporate tax cut on *overall public* revenues our results even reveal some tentative evidence that a reduction in the effective tax rate in OECD may actually be likely to lead to an increase in overall public revenue, as increased company investment increased other tax receipts such as income tax.

Annexes

Annex 1: The 15 action plans on BEPS

Action 1: Address the tax challenges of the digital economy:

According to the Action Plan, the current digitalising economy posed challenges to international taxation rules, such as companies being able to provide cross-border digital goods and services without having a taxable permanent establishment in the country of supply. This Action sought to 'develop detailed options to address these difficulties' (OECD, 2013a).

Action 2: Neutralise the effect of Hybrid Mismatch Arrangements:

'Hybrid mismatch arrangements' can arise when two countries' tax systems characterise a certain business activity (e.g. a payment) differently. These differences between systems may be used by companies to achieve double non-taxation.

Action 3: Strengthen CFC Rules:

Controlled Foreign Company (CFC) rules are designed to prevent companies from artificially deferring their income to a taxable company, usually the resident shareholder, which has its registered office in a low-tax country. While CFC rules had been in place in many countries since long, the Action Plan warned that these rules 'do not always counter BEPS in a comprehensive manner' and thus recommended these to be strengthened (OECD, 2013a).

Action 4: Limit base erosion via interest deductions and other financial payments:

The alleged practice of companies lowering their tax liability by adjusting the amount of debt through the use of interest expenses and other financial payments was observed to be 'excessive' according to the Action Plan. The Action Plan encouraged to develop 'best practices' to discourage this behaviour and thus avoid double non-taxation of companies (OECD, 2013a).

Action 5: Counter harmful tax practices more effectively, taking into account transparency: and substance:

This Action would specifically address so-called 'tax rulings', which, according to the OECD, often involved 'paper income rather than substantial business activities' (OECD, 2013a). In order to improve transparency on this issue, the OECD recommended that 'compulsory spontaneous exchange of information' on certain tax rulings between countries should take place (OECD, 2013a).

Action 6: Prevent treaty abuse:

This Action would address the so-called practice of 'treaty shopping' whereby companies would make use of the most favourable tax treatment in different countries, whereby the taxable income in place would possibly not be in line with the value created in that jurisdiction. This Action's goal was to 'more closely align the allocation of income with the economic activity that generates that income' (OECD, 2013a).

Action 7: Prevent the artificial avoidance of Permanent Establishment (PE) status:

In international taxation, business profits of a foreign enterprise are only taxable in the countries where the enterprise has a so-called 'permanent establishment' (a fixed place of business). The definitions of this PE-status vary around the world, which led, according to the OECD, to tax avoidance strategies by companies to circumvent the PE-definitions. The Action Plan encouraged to come up with stricter rules on these PE-definitions.

Action 8, 9 and 10: Assure that transfer pricing outcomes are in line with value creation (Intangibles, risks and capital, other high-risk transactions):

According to the OECD, transfer pricing rules, whereby a price is charged by a company for goods, services or intangible property to a subsidiary or other related company, have sometimes been misapplied to separate income 'from the economic activities that produce that income and to shift it into low-tax environments' by e.g. moving intangibles across group members, transferring risks or excessive capital to group members, or perform transactions which rarely happen between third parties (OECD, 2013a).

Action 11: Establish methodologies to collect and analyse data on BEPS and the actions to address it:

The OECD argued that research on BEPS has been challenging due to the complex tax structures in place. Due to the complexity of the topic, data do not always sufficiently demonstrate e.g. the amount of tax revenue lost due to e.g. double non-taxation. The Action Plan called on countries to 'develop (...) indicators of the scale and economic impact of BEPS' (OECD, 2013a).

Action 12: Require taxpayers to disclose their aggressive tax planning arrangements:

Following on from Action 11, the Action Plan stated there was also a need for further information on aggressive tax planning arrangements, recommending that 'measures designed to improve the information flow' about this would be useful to tax policymakers and tax administrations (OECD, 2013a).

Action 13: Re-examine transfer pricing documents:

According to the OECD, the issue of transfer pricing was often open to abuse with companies charging artificially high or low levels in order to adjust their tax liability. In order to address this, the Action Plan stressed that 'the asymmetry of information between taxpayers and tax administrations' would need to be reduced in order to address this (OECD, 2013a).

Action 14: Make dispute resolution mechanisms more effective:

To complement the measures taken under the BEPS-project, and to 'ensure certainty and predictability for business' (OECD, 2013a), the Action Plan noted that current dispute resolution mechanisms would need to be more effective to ensure that disputes between two or more countries, e.g. where they both claim corporate tax on the same profit, can be resolved more quickly.

Action 15: Develop a multilateral instrument:

Bilateral tax treaties would need to be updated individually to include the measures of the previous 14 Actions. The Action Plan warned that doing these changes ‘on a purely treaty by treaty basis’ would be a ‘very lengthy’ process (OECD, 2013a). To avoid this, the BEPS-Project would seek to develop a multilateral instrument which would allow countries to update their tax treaties on a swift multilateral basis (in a more cross-reference overview).

Annex 2: BEPS- The 4 minimum standards

Fight harmful tax practices (BEPS Action 5):

As part of BEPS' goal to increase transparency requirements (see also Action 13), Action 5 specifically addressed the issue of 'tax rulings'. The OECD argued that these often involved 'paper income, rather than substantial business activities' (OECD, 2015b). In order to provide tax administrations with more information and transparency on this, countries would start from April 2016 to exchange information on those tax rulings that may give rise to BEPS-concerns. In addition, the minimum standard requires that countries endorse a so-called 'nexus' approach on tax rulings, or a 'concrete link, between the location of the activities generating the income eligible for the preferential tax treatment (...) and the location of the income benefiting from a preferential regime' (OECD, 2015b).

Prevent tax treaty abuse, including treaty shopping (Action 6):

To avoid entities treaty shopping in search of the most favourable tax treatment with little or no regard for the connection to the value created in that jurisdiction, participating countries will adopt a 'minimum standard' in treaty shopping. This minimum standard includes e.g. a Limitation on Benefits rule ('LOB-rule'), which would make tax treaty benefits not available to all anymore. A series of conditions would be put in place, based 'on the legal nature, ownership in, and general activities of the entity', to make certain that there is 'a sufficient link between the entity and its state of residence' (OECD, 2015b). This would address the practice of the above-mentioned 'letterbox companies' which were often the source of public outcry during the publication of the 'taxpapers'.

Improve transparency with Country-by-Country Reporting (Action 13):

In an effort to improve tax transparency, so-called Country-by-Country-Reports (CBCR) were launched as a minimum standard under Action 13. This would ensure that multinational enterprises provide 'all relevant governments with needed information on their global allocation of the income, economic activity and taxes paid among countries' in a common worldwide template (OECD, 2015). There has been support for CBCR across business and non-governmental organisations, as it specifically addresses the above-mentioned 'taxpapers' controversies: with CBCR in place, the OECD argues it would be 'easier for tax administrations to identify whether companies have engaged in (...) practices that have the effect of artificially shifting substantial amounts of income into tax-advantaged environments' (OECD, 2015b). Transparency International has welcomed CBCR and noted that with CBCR in place 'Luxleaks would have been unnecessary' (Transparency International, 2015).

Enhance the effectiveness of dispute resolution (Action 14):

Countries (and companies) were concerned that, by implementing new rules on BEPS, the possibility of unintended double taxation would increase. To solve these cases more swiftly, the OECD argued that the so-called Dispute Resolution Mechanisms, where countries can solve these disputes in an out-of-court settlement, should be improved. In particular, the minimum standard now requires countries to resolve these disputes in a timelier manner, i.e. 'within an average timeframe of 24 months' (OECD, 2015b).

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