



The tax system penalizes the growth of new and small businesses in the EU

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Contents

Abstract2

Acknowledgements3

Executive summary4

1 Introduction and policy context5

2 Data and findings7

 2.1 *Effective taxation and firm size*7

 2.2 *Effective taxation, firm size and firm growth*9

3 The case of the 2015 corporate tax reform in Spain14

4 Summary and conclusion16

References17

List of abbreviations and definitions25

List of tables26

List of figures27

Abstract

We provide evidence on the differences in the effective tax rate by firm size, highlighting that effective tax rates tend to follow a bump-shaped curve, increasing from micro to small firms and then decreasing for medium to large firms. Our analysis, based on microdata from several EU countries, shows that both corporate and labour taxation follow this pattern. Econometric analysis reveals that a 1% increase in effective corporate taxation results in a 2.6% decrease in firm turnover growth, with new firms and micro firms being particularly affected. The negative impact of corporate taxation on firm growth is much larger for new firms compared to older firms, and this is especially pronounced in Spain, where a 1% tax hike leads to a turnover growth decrease of 8%. Examining the 2015 Spanish corporate tax reduction for new firms, we find that the reform's overall positive impact was insignificant for micro firms, suggesting the need for more targeted policies considering firm size, age, and ownership.

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Executive summary

This study provides descriptive evidence on the differences in effective tax rates by firm size, focusing on corporate and labour taxation across nine EU countries: Belgium, Spain, France, Croatia, Italy, Poland, Portugal, Romania, and Slovakia. Further, it analyses the impact of effective corporate taxation on firm-level turnover growth using econometric analysis and examines a specific case of tax reform implemented in Spain. It offers an analytical framework to evaluate tax burdens specifically for new and micro firms.

Policy Context

Small businesses represent the largest share of total employment in the EU, playing a key role in promoting growth and innovation, especially during periods of deep and rapid structural and technological changes, such as the ongoing green and digital transitions. Governments often adopt preferential tax schemes to encourage new business creation, given that existing tax structures, particularly in EU countries characterized by high tax burdens, may hamper their development potential. Against this background, one could argue that policy reforms need to address the tax disadvantages faced by small firms to encourage growth and innovation. Yet, existing evidence suggests that the tax burden is unequally distributed depending on firm size. Recent studies have provided substantial evidence on the tax advantages of large multinational corporations, which exploit the loopholes of the international tax system, something SMEs cannot benefit from. Additionally, certain features of the tax system may inherently disadvantage small businesses relative to larger enterprises, such as the asymmetric treatment of profits and losses, a bias towards debt over equity, and higher comparative costs related to tax compliance. This environment raises questions about whether SMEs, particularly micro and small firms, are at a competitive disadvantage, as they often cannot employ the tax strategies available to larger multinationals due to their size and domestic focus. Over the past decade, discussions and policy initiatives have aimed at simplifying tax rules and reducing compliance costs for firms, especially SMEs. Despite reduced tax rates and incentives for micro and new firms, evidence on how these incentives affect their growth is limited.

Analysis

This paper provides evidence on how effective tax rates change depending on firm size and how corporate effective tax rates impact firms' growth. A composite effective tax rate, complementing corporate effective tax rates with social security contributions paid by employers used as proxy for labour taxes, is constructed and analysed descriptively. An econometric analysis of the impact of corporate effective tax rates on firm growth is conducted. To examine the policy implications, the study considers the specific case of the Spanish corporate tax reduction for new firms adopted in 2015, using an event analysis.

Main Findings

Our results suggest the existence of a bump-shaped curve in effective tax rates, where such rates tend to increase from micro to small firm size but then decrease for medium to large firms. This pattern holds when considering either corporate taxation alone or both corporate and labour taxation together. Our econometric analysis indicates that a 1% increase in effective corporate taxation leads to a 2.6% decrease in firm turnover growth on average. The negative impact is much larger for new firms (4.1%) and is especially pronounced in Spain, where a 1% tax hike leads to an 8% decrease in turnover growth for new firms, followed by Italy and Belgium, with a corresponding 5% decrease. Micro firms are the most sensitive to the corporate effective tax burden, particularly in Southern EU countries, including Spain, Italy, Portugal, and Romania. We consider more specifically the Spanish case given the adoption in 2015 of tax reforms aimed at supporting new firms through reduced corporate income tax rates. First, our descriptive findings indicate that micro and small firms have experienced a significant increase in their effective tax burden, especially after 2012 and despite the adoption of the 2015 reform. On the contrary, medium and large firms saw the same indicator remain relatively stable or experience a slight decline during the same period. We also analyse the impact of the 2015 reform using econometric analysis. Our results reveal that the impact of this reform was positive, albeit insignificant for micro firms, casting doubt on its effectiveness. Our findings highlight the importance of considering firm size, age, and ownership characteristics in evaluating the effects of relevant tax policy changes.

1 Introduction and policy context

Recent studies have provided substantial evidence on the tax advantage of large multinational corporations, which, thanks to their global business organisation, allow them to minimise their tax burden by exploiting the loopholes inherent to the international tax system. Such an advantage is especially salient in the European Union (EU) context, where capital circulates freely while tax rules remain essentially national (see Tørsløv et al., 2023). Furthermore, certain features of the tax system may inherently disadvantage small businesses relative to larger enterprises, such as the asymmetric treatment of profits and losses, a bias towards debt over equity, and higher comparative costs related to tax compliance (see OECD, 2015; European Commission, 2022). To get a complete picture of the tax burden faced by small businesses and their possible disadvantage compared to large firms, it is necessary to also consider labour taxation, given that small businesses tend to be more labour intensive than large firms (see Kumar et al., 1999).

Over the past decade, discussions and policy initiatives aimed at simplifying tax rules and reducing compliance costs for firms, especially SMEs (Small and Medium-sized Enterprises), have been ongoing in Europe. Initiatives such as the CCCTB (Common Consolidated Corporate Tax Base), BEFIT (Business in Europe: Framework for Income Taxation), and the recently proposed Head Office System (HOT) by the European Commission to promote SMEs' cross-border activities are at the forefront. Additionally, there is heightened scrutiny over the tax burden on domestic firms compared to multinationals, primarily focusing on multinational tax avoidance and profit shifting. The OECD's Base Erosion and Profit Shifting (BEPS) initiative, along with the June 2021 agreement by G7 finance ministers to establish a minimum global corporate tax rate of at least 15%, are among the key measures targeting these concerns. On 1 January 2024, new EU rules took effect, setting a minimum effective taxation rate of 15% for multinational companies active in EU Member States. These rules, unanimously agreed upon by Member States in 2022, mark the EU's implementation of the 'Pillar 2' rules from the 2021 global deal on international tax reform.¹

This environment raises questions about whether SMEs (micro and small firms, in particular) are at a competitive disadvantage, as they often cannot employ the tax strategies available to larger multinationals due to their size and/or the domestic scope of their activity. Many countries offer small enterprises various forms of relief to mitigate these disadvantages. The corporate income tax burden varies significantly across Europe, with SME tax incentives less common than R&D tax incentives (Spengel et al., 2015). Typically, reduced tax rates are used to support SMEs, particularly micro corporations. Despite the incentives for micro and new firms, evidence on how these incentives affect their growth is limited.

This paper provides evidence on how effective tax rates change depending on firm size and how corporate effective tax rates impact firms' growth. The effective tax rate represents the tax burden effectively paid by firms, in contrast with statutory tax rates, which do not embed possible reductions in the taxes paid through specific tax rebates affecting the rate and/or the base. We construct a composite effective tax rate that complements the corporate tax burden with the inclusion of social security contributions paid by employers which are used as proxy for labour taxation. Our analysis covers nine EU countries: Belgium, Spain, France, Croatia, Italy, Poland, Portugal, Romania, and Slovakia. We use extensive corporate balance sheet data from the Orbis database, encompassing nearly 4 million firms, covering the years 2008-2019, and social security contributions data from the EUROMOD microsimulation model.²

We find evidence for a bump-shaped pattern of both corporate and composite effective tax rates (ETRs) depending on firm size. While micro firms tend to face low corporate ETRs, they experience a sizable increase in their corporate tax burden when transitioning from micro to small size status. The composite ETRs reveal a different picture for Spain and Italy, with the tax burden faced by micro firms surpassing that faced by larger firms. We further use the firm-level variation in corporate ETRs to analyse their impact on firms' growth by performing econometric estimations. We find that a 1% increase in corporate ETRs leads to a 2.6% decrease in firm growth, which is statistically significant. Our econometric analysis shows that the growth of micro and new firms is significantly and negatively impacted by the corporate tax burden they face, making them the most sensitive firm categories to this burden. This result is especially pronounced in Southern EU countries such as Spain, Italy, and Portugal, as well as in Romania.

¹ See https://taxation-customs.ec.europa.eu/taxation-1/corporate-taxation/minimum-corporate-taxation_en

² We are grateful to Andrea Papini for providing the Euromod data.

SMEs represent two third of EU employment and almost 57% of total value added generated by the non-financial business sector, see European Commission (2022). Their role is key in promoting growth and innovation, especially during a period of rapid economic transformation and technological change characterizing the ongoing green and digital transition. Yet, our evidence suggests that existing tax structures hamper their potential contribution to economic growth despite preferential tax systems implemented in many EU countries, particularly in the EU periphery. Against this background, one could argue that policy reforms need to address the tax disadvantage faced by small firms. We consider this question by analysing the specific case of the corporate tax reform implemented in Spain in 2015, which granted a special tax rebate to newly incorporated entities carrying out business activities, taxed at a rate of 15%, as opposed to the benchmark corporate tax rate of 30%. We find that while the corporate tax cut had a favourable impact on the growth of the targeted group, this impact remained insignificant for micro firms, indicating a limited effect of the policy reform. This could occur because the tax cut was not sufficient and/or because it did not offer a distinctive advantage over medium and large firms, given the general reduction in the corporate tax rate that took place at the same time, decreasing from 30% to 28% in 2015, and from 28% to 25% in 2016.

The rest of the paper is organised as follows. Section 2 provides details on the data used and an analysis of the descriptive statistics and the econometric estimation assessing the impact of effective taxation on firms' growth. Section 3 focuses on the analysis of the 2015 Spanish tax reform.

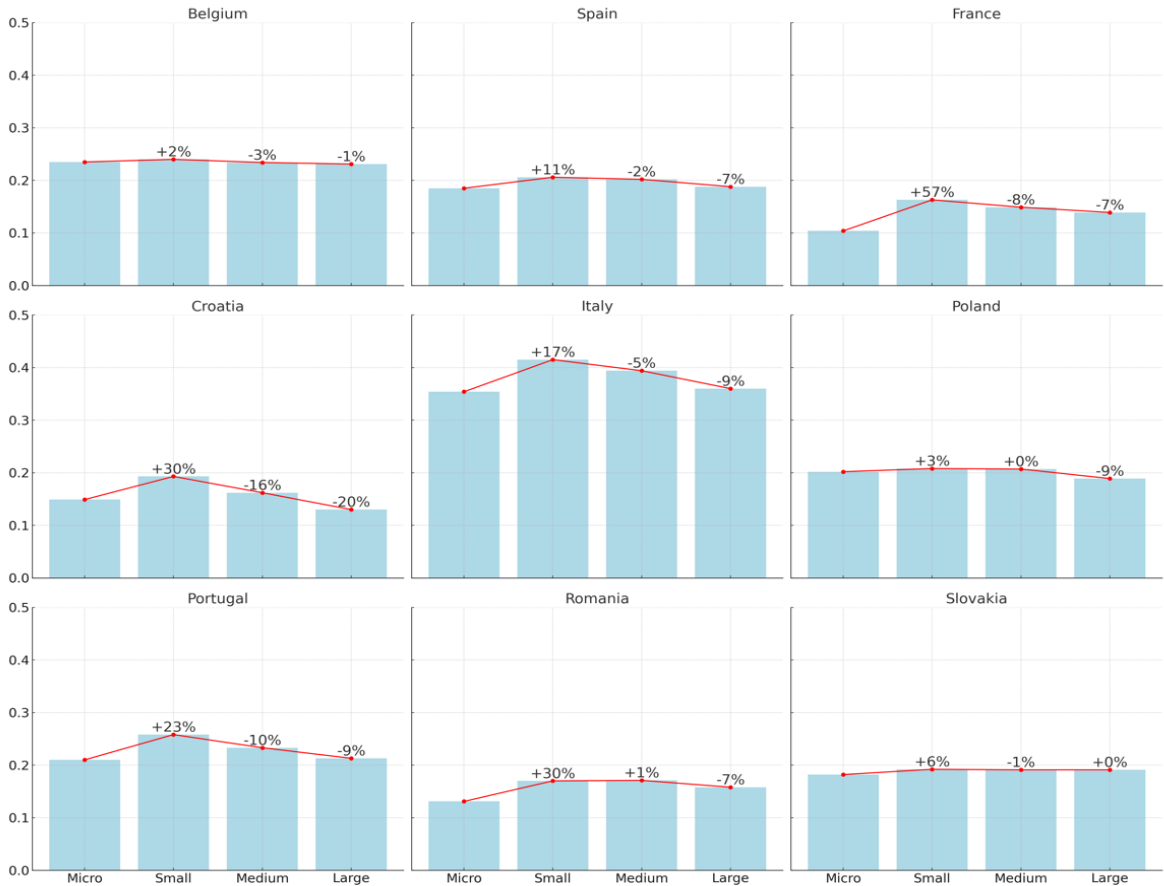
2 Data and findings

2.1 Effective taxation and firm size

We examine how corporate effective tax rates and a composite effective tax rate, which includes social security contribution rates paid by employers in order to proxy labour taxation, change by firm size. We construct a firm-year variable for corporate effective tax rates based on the taxation data from Orbis, which includes both current and deferred taxes. We then divide this by profits and losses before taxes. We create three sets of corporate ETRs: the first excludes negative taxation values (such as refunds) and loss-making firms; the second includes negative taxation values but excludes loss-making firms; and the third includes both negative taxation values and loss-making firms. In all sets, we truncate ETR values to fall between 0 and 1.

Micro-enterprises tend to face lower average corporate effective tax rates than larger enterprises, as documented by Bachas et al. (2023) for a sample of developing countries and validated by our sample in the EU context (Figure 1). Our calculations reveal a consistent trend across the countries in our sample, where micro firms exhibit the lowest corporate effective tax rates, likely due to tax credits. Corporate effective tax rates increase for small and medium-sized firms and then decrease again for large firms, suggesting a pattern of tax avoidance. Therefore, when transitioning from micro to small size status, firms face a sizeable relative increase in corporate effective tax rates, which varies on average from +2% in Belgium to +57% in France. The values of corporate effective tax rates tend to relatively decrease afterward when moving from medium to large firm status, with this decrease being most pronounced in Italy (-9%), Portugal (-9%), Poland (-9%), and Croatia (-20%).

Figure 1. Corporate ETRs by Firm Size

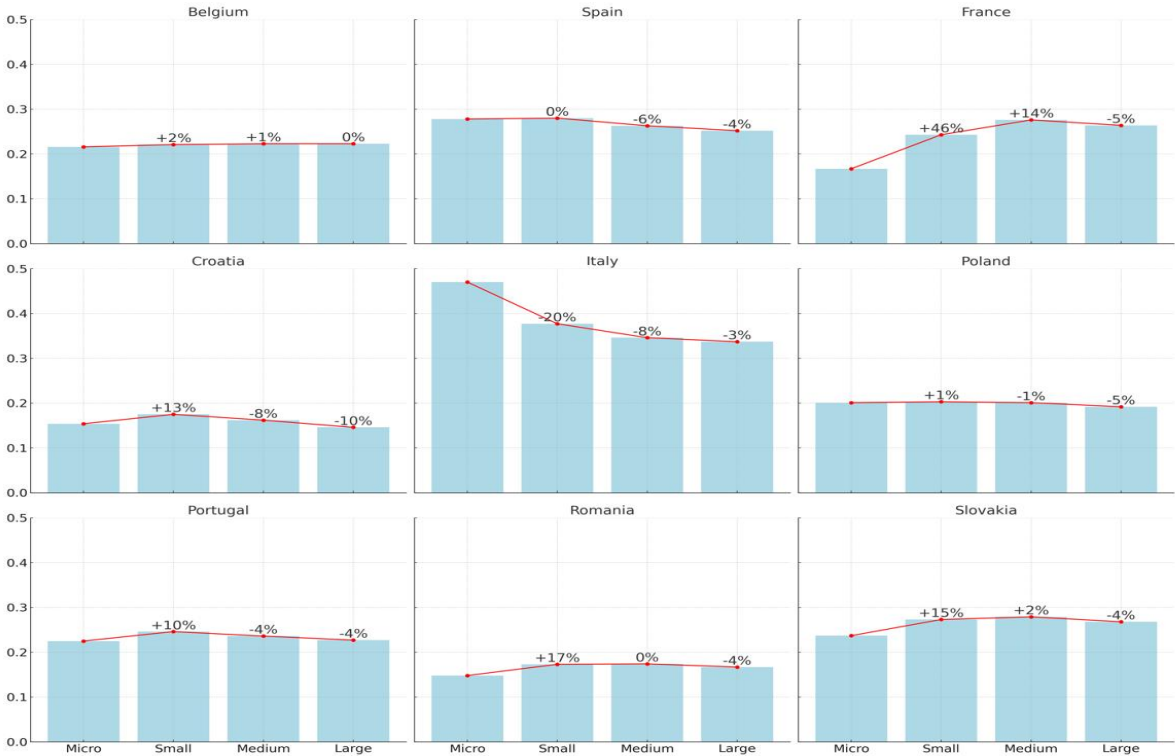


Sources: Orbis database and authors' calculations

To complement the corporate tax burden with social security contribution rates paid by employers, we introduce a composite tax indicator. We construct a country, firm size, and year level composite effective tax rate that encompasses two parts: capital and labour. To combine the effective corporate and labour tax rates, we construct a production function at the country-firm size-year level, with weights varying by firm size following the methodology of Barrios et al. (2018). This composite tax indicator provides a holistic, more nuanced understanding of the tax burden for businesses by capturing the interplay between different types of taxes and the differences in factor intensity between firm size categories. For the capital part, we use the average corporate effective tax rates by country-firm size-year, weighted by the total EBITDA at the same level. For the labour part, since we do not possess information on the distribution of wages at the firm level, we estimate social security contribution rates at the country-firm size-year level using simulations from the EUROMOD microsimulation model.³ Social security contribution rates are calculated as the average social contributions paid by employers over the gross employment income at the country-firm size-year level. These averages by firm size are constructed for all nine countries in our sample over the same period (2008–2019). Then, we weight these by the total employee expenses at the same level.

On average, we find that weights vary between 0.60 for labour and 0.40 for capital, which is in line with existing empirical estimates, such as those by Akerberg et al. (2015). We then average these composite tax rates by country and firm size, removing the time dimension, and construct Figure 2. Our calculations confirm the bump-shaped evolution of the effective tax rate when moving from micro to small firm size in Croatia, Poland, Portugal and Romania. In France and Slovakia, the increase and subsequent decrease take place later in the firm-size distribution, while in Italy, the composite ETR decreases sharply from micro to small firm size and continue to do so as firm size increases. In Belgium, on the contrary the composite effective tax rate increases slightly or remains flat along the firm size distribution. For Spain and Italy, the tax burden faced by micro firms surpasses that faced by larger firms.

Figure 2. Composite ETRs by Firm Size



Sources: Orbis database, Eurostat and authors' calculations

³ Joint Research Centre, European Commission, EUROMOD: model I6.39+, 2024, <https://euromod-web.jrc.ec.europa.eu/>

2.2 Effective taxation, firm size and firm growth

Next, we examine the impact of corporate effective tax rates on firm growth. Our analysis covers the same nine countries and period (2008-2019), and we again use firm-level financial accounting data from Orbis Bureau van Dijk.

The empirical model is the following:

$$firm\ growth_{it} = a_1 ETR_{it} + \gamma C_{it} + \mu_i + \eta_{jt} + \varepsilon_{it} \quad (1)$$

For firm growth (*firm growth*), we calculate operating revenue turnover growth as follows: (turnover at t+1 - turnover at t) / turnover at t. For the corporate effective tax rates (*ETR*), we use the measures that we constructed as discussed in the first paragraph of section 2.1. Specifically, we use the ETR that includes both negative taxation values and loss-making firms, truncated between 0 and 1. We include only the corporate effective tax rates in this econometric analysis because we have firm-level data for this part, in contrast to the social security contributions. This allows us to provide robust results by exploiting panel data techniques. To isolate the impact of the corporate effective tax rate from other factors that might influence firm growth, we include a variety of control variables in different specifications, indicated by C_{it} in equation (1).

At the firm level, these controls include total assets and number of employees (to account for firm size), return on assets and several profitability ratios (for efficiency and profitability), leverage ratio (for capital structure), ratio of tangible to total assets (for asset composition), and cash divided by total assets (for liquidity). We also consider firm age to account for the varying stages of a firm's lifecycle. At the macro level, we include controls for productivity, economic wealth, and growth (GDP per capita, GDP growth), inflation, and population. Additionally, we include a set of variables that measure institutional quality (Rule of Law, Regulatory Quality, and Control of Corruption). Better rule of law and regulatory quality can enhance business operations through more reliable business environments and lower transaction costs. All control variables are at period t and are defined in Table 1. The summary statistics of all the variables are analysed in Table 2.

[Please insert Tables 1 & 2 about here]

A vector of fixed effects is included to control for unobserved heterogeneity. In our main specification, we include firm, country-year, and industry-year fixed effects. First, firm fixed effects (μ_i) account for all time-invariant characteristics of individual firms, such as foundational business strategies, management style, and established market presence. This enables us to isolate and examine the within-firm variations in firm growth over time that result from changes in effective tax rates. Additionally, in the case of our sample, they allow us to control for whether a firm is multinational or domestic. Second, we include country-year and industry-year fixed effects (η_{jt}) that control for external factors such as macroeconomic conditions, regulatory and policy changes, and industry-specific shocks that could affect all firms similarly within the same country and industry in a given year. Country-year fixed effects render all the country-year variables redundant in the main specification; we use these variables in sensitivity analysis. Finally, ε_{it} is the error term.

In our main specification (specification 4) of Table 3, which includes 14,570,208 firm-year observations from 2,239,699 unique firms, we find a significant and negative effect of corporate effective tax rates on firm growth. Economically, the results are very strong. Specifically, a 1% increase in corporate ETRs corresponds to a 2.6% decrease in firm growth, estimated by multiplying the coefficient of corporate effective tax rates (-157.725) by 1% and then dividing this product by the mean firm growth of our regression sample (60.70 in Table 2). Applying this estimation to the average operating turnover for the firms in our sample at period t, which is 5.2 million euros, we find that a 1% increase in effective tax rates would result in an estimated decrease of approximately 135 thousand euros in operating turnover at period t+1. Extending this calculation to the total operating turnover for the firms in our sample at period t, which amounts to 76 trillion euros, we find that a 1% increase in effective tax rates would lead to an estimated decrease of approximately 1.97 trillion euros in operating turnover at period t+1 compared to period t.

[Please insert Table 3 about here]

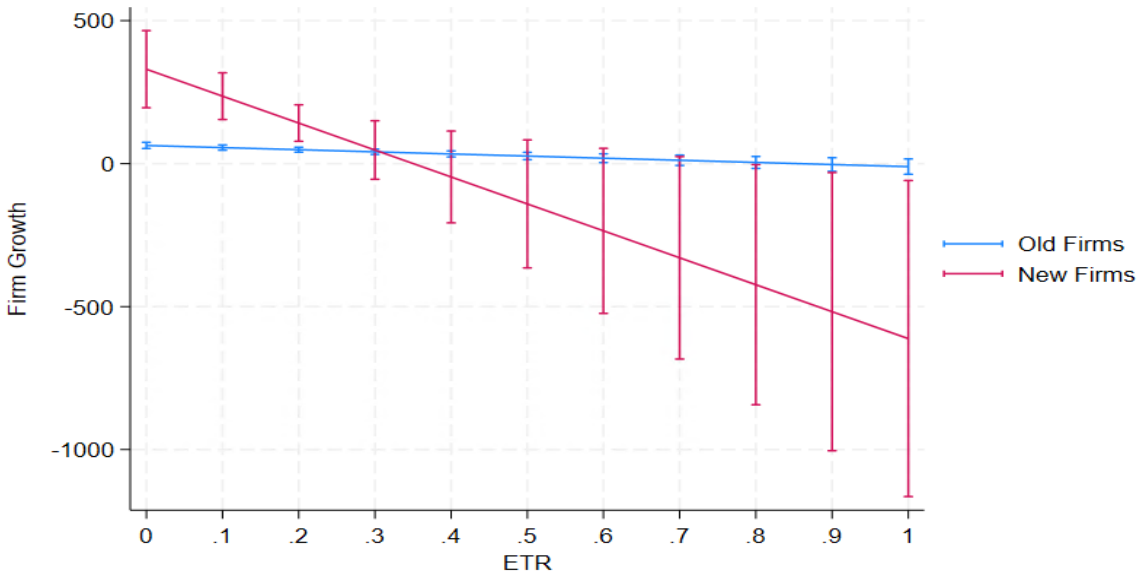
This relationship could be due to higher taxes reducing the possibility of reinvesting back into the business or using funds for expansion, leading to decreased firm growth. The result aligns with Egger et al. (2009), which indicates a negative relationship between forward-looking effective tax rates and the cost of capital, subsequently influencing net investments. The signs of the other firm controls are consistent with the literature, validating our model. Specifically, we find a negative effect of firm size (total assets) and age on growth, indicating that older and larger firms exhibit lower growth rates compared to younger and smaller firms. Additionally, we observe a positive effect of liquidity and efficiency indicators on firm growth. This suggests that firms without cash-flow problems are less likely to face financing constraints that could hamper their growth (Zhou and de Wit, 2009; Lopez-Garcia and Puente, 2012; and references therein).

We extend our analysis to examine whether the growth of new firms is more affected by the corporate tax burden, as measured by corporate ETRs, compared to older firms, and how the relationship between corporate ETRs and firm growth might differ according to firm size. First, we introduce an interaction between corporate effective tax rates and a binary variable for new firms based on their age (defined as firms no older than two years). We find that newer firms experience a more negative impact of corporate ETRs on firm growth. A 1% increase in corporate ETRs corresponds to a 2% decrease in firm growth for older firms, whereas for new firms, it corresponds to a 4.1% decrease.⁴ Applying this estimation to the total operating turnover for the new firms in our sample at period t, which amounts to 1.7 trillion euros, we find that a 1% increase in effective tax rates would lead to an estimated decrease of approximately 69 billion euros in operating turnover at period t+1 compared to period t.

[Please insert Table 4 about here]

We highlight this in Figure 3, where we compare the impact of corporate ETRs on firm growth across different corporate ETR levels. The growth of older firms is slightly negatively affected by an increase in corporate ETRs (blue line), but the slope is almost flat compared to the slope for new firms (red line), which experience a much steeper decrease in their growth from an increase in corporate ETRs. New firms initially experience higher growth rates than older firms, possibly due to initial expansion phases, investment influx, or entering underserved markets. However, the impact of an increase in the effective tax rate is much more negative for new firms compared to older firms. This suggests that new firms are more sensitive to changes in the corporate tax burden, which could be due to their limited capacity to absorb or offset new financial burdens given their developmental stage and potentially limited financial buffers.

Figure 3. Impact of corporate ETR on Firm Growth: New vs Old Firms

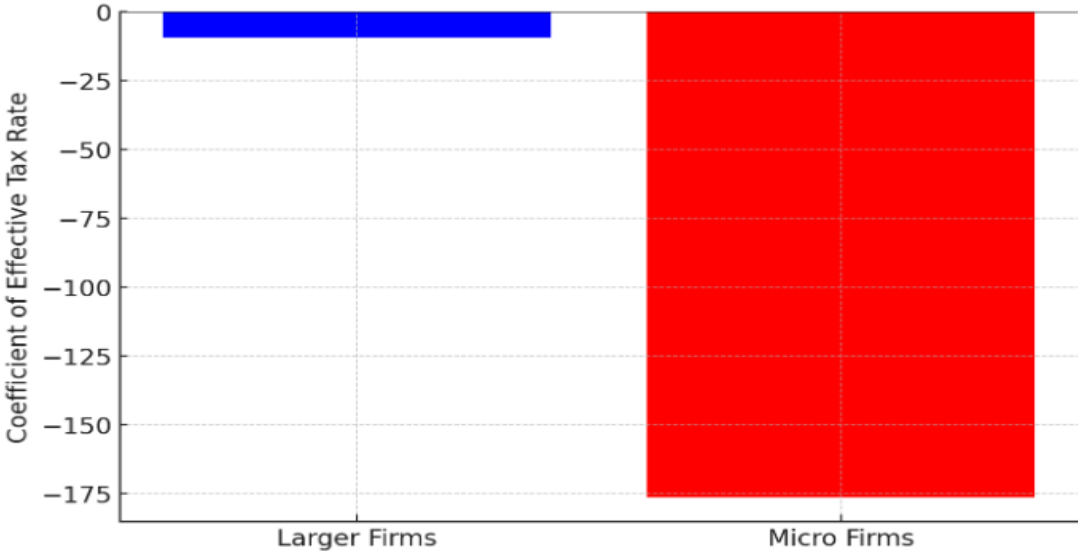


Sources: Authors' econometric estimations

⁴ Calculated by multiplying the coefficient of corporate effective tax rates for new firms in specification 1 of Table 4 (74.210 + 868.016= 942.22) by 1% and then dividing this product by the mean firm growth of new firms in our sample (228.46).

Second, we interact corporate effective tax rates with a binary variable for firm size, defined according to Eurostat's classification based on annual turnover (1 for micro firms, 0 for all other firm sizes).⁵ Our results remain robust when using the number of employees as an alternative definition for firm size. The interaction coefficient for corporate ETR for micro-enterprises is negative and significant (-166.913). For all other firm sizes, the results are insignificant (see Table 4, specification 2). Figure 4 illustrates this relationship by comparing the impact of corporate ETR on firm growth by firm size, highlighting that the negative impact of the corporate effective tax rate on firm growth is significantly more pronounced for micro-enterprises than for larger firms, where the impact is insignificant.

Figure 4. Impact of Corporate ETR on Firm Growth: Micro vs Larger Firms



Sources: Authors' econometric estimations

Furthermore, we extend the analysis from Figures 3 and 4 to the country level for the entire time-period of our sample. In Figure 5, we explore the differential impact of corporate effective tax rates on firm growth for new firms across various countries. Belgium, Spain, Italy, Poland, Portugal, and Romania demonstrate significant (marked in green) and substantial negative impacts, indicating a strong sensitivity in the growth of new firms to increases in corporate effective tax rates. Italy, Portugal, Romania, and Spain are particularly notable, occupying the top positions. Figure 5 visualizes the coefficients of Table 5 after adjusting with the corresponding baseline coefficient.

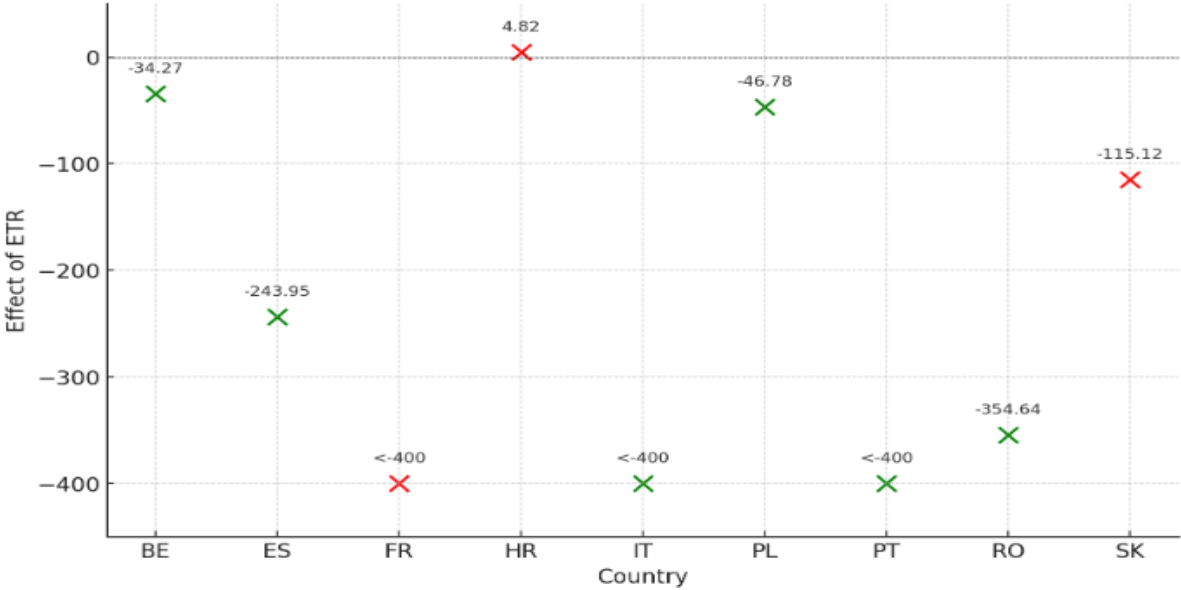
In countries in which significant impacts are observed, the situation varies in economic terms. Specifically, a 1% increase in corporate effective tax rates corresponds to an 8% decrease in firm growth for new firms in Spain⁶, with Italy and Belgium following with a 5% decrease each. Applying this estimation to the total operating turnover for new Spanish firms in our sample at period t, which amounts to 399 billion euros, we find that a 1% increase in corporate effective tax rates would lead to an estimated decrease of approximately 32 billion euros in operating turnover at period t+1 compared to period t. Similarly, applying this estimation to the total operating turnover for new Spanish firms in our sample in 2017, which amounts to 39 billion euros, we find that a 1% increase in corporate effective tax rates would lead to an estimated decrease of approximately 3.1 billion euros in operating turnover in 2018 compared to 2017.

Conversely, Croatia, France, and Slovakia show insignificant impacts (marked in red). Notably, France displays a very negative but insignificant effect, which requires further examination.

⁵ Micro-enterprises have an annual turnover up to €2 million. Small enterprises generate more than €2 million but less than €10 million. Medium-sized enterprises record turnovers between €10 million and €50 million. Large enterprises achieve turnovers of €50 million or more.

⁶ Calculated by multiplying the coefficient of corporate effective tax rates for new firms in Spain (243.95) by 1% and then dividing this product by the mean firm growth of new firms in Spain in our sample (29.587).

Figure 5. Impact of Corporate ETR on Firm growth of New Firms across Countries

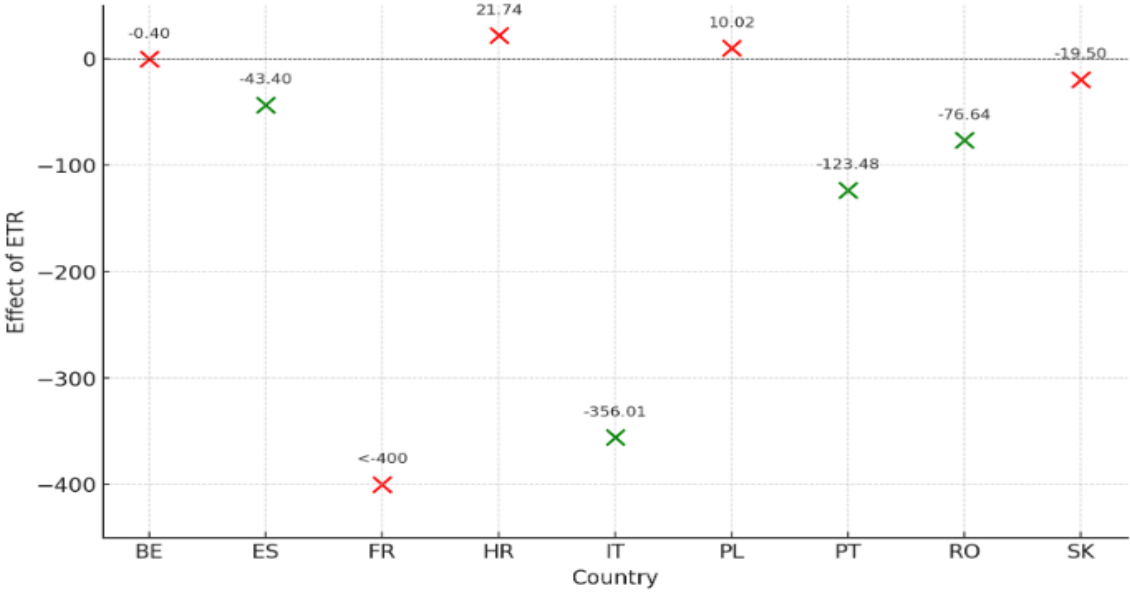


Sources: Authors’ econometric estimations

In Figure 6, we explore the differential impact of corporate effective tax rates on the growth of micro firms across various countries. Micro firms in Spain, Italy, Portugal, and Romania show significant negative effects, suggesting that higher effective tax rates are detrimental to their growth. Italy and Portugal, in particular, exhibit some of the largest significant negative impacts, which are marked in green, indicating a strong sensitivity to increases in the effective tax rate for micro firms in these countries. Figure 6 visualizes the coefficients of Table 6 after adjusting with the corresponding baseline coefficient. Economically, a 1% increase in corporate effective tax rates corresponds to a 3% decrease in firm growth for micro firms in Spain⁷, Italy, and Portugal, and a 2.5% decrease for micro firms in Romania. Applying this estimation to the total operating turnover for micro Spanish firms in our sample at period t, which amounts to 1.5 trillion euros, we find that a 1% increase in corporate effective tax rates would lead to an estimated decrease of approximately 46.2 billion euros in operating turnover at period t+1 compared to period t. Meanwhile, Belgium, France, Croatia, Poland, and Slovakia show no significant impacts, which are marked in red. This suggests that in these countries, changes in the effective tax rate do not play a decisive role in influencing the growth of micro firms.

⁷ Calculated by multiplying the coefficient of corporate effective tax rates for micro firms in Spain (43.40) by 1% and then dividing this product by the mean firm growth of micro firms in Spain in our sample (12.96).

Figure 6. Impact of Corporate ETR on Firm growth of Micro Firms across Countries



Sources: Authors' econometric estimations

3 The case of the 2015 corporate tax reform in Spain

As observed in the country analysis of new firms (Figure 5) and micro firms (Figure 6), the growth of corresponding Spanish firms appears to be significantly and negatively affected by the corporate tax burden in both cases. Analysing the annual trends of corporate ETRs, social security contribution rates (labour ETRs), and composite ETRs in Spain for different firm sizes (Figure 7), we identify that the relatively decreasing or stable patterns until 2012 across firm size give way to increasing patterns for corporate ETRs and social security contribution rates after 2012 for micro and small firms. During this period, the effective corporate tax rate for micro firms increased by 3.6% (+3.1% for small firms), and the effective labour tax rate increased by 13% (+6.9% for small firms). In contrast, the picture is rather stable for medium firms, and for large firms, the corporate ETRs show a declining trend after 2014.

Figure 7. Annual Trend of Corporate ETR, Labour ETR and Composite ETR in Spain



Sources: Orbis database, Eurostat and authors' calculations

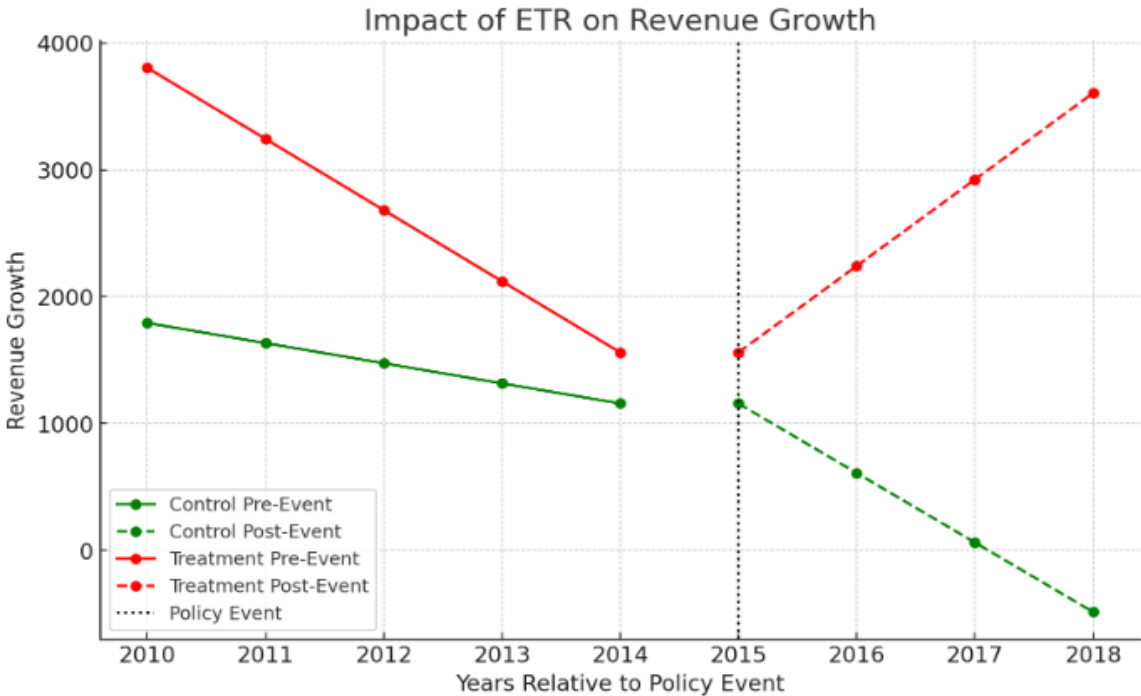
Spanish tax law offers several incentives, including reduced tax rates for small and medium-sized firms based on their tax base, throughout our analysis period. There is a specific event for new firms: effective from 1 January 2015, newly incorporated entities carrying out business activities are taxed at a rate of 15% against a benchmark rate of 28% which was later reduced to 25%, regardless of the amount of the tax base.⁸ This reduced corporate tax rate of 15% for new companies applies during the first two years in which they achieve profits. However, this special tax rate does not apply in certain cases, such as newly created companies that are part of or controlled by a group of companies. This setting is ideal for an event analysis in the form of a difference-in-difference model extended by an interaction term to assess the impact of a change in corporate effective tax rates on firm growth. We define an 'event' variable as 1 for years after and including 2015, indicating the post-policy period, and 0 for years before the policy. A 'treatment' variable

⁸ This incentive was effective from 1 January 2013, but with different thresholds. Newly incorporated entities engaged in business activities were taxed at a rate of 15% on the tax base up to EUR 300,000 and at a 20% rate on the tax base exceeding that amount.

is 1 for Spanish firms in their first two profitable years that are neither part of a domestic nor a multinational group, and 0 otherwise. These variables are interacted with the corporate effective tax rate to isolate the impact on the growth of new, independent Spanish firms relative to older firms and newly created firms that are part of a company group, before and after the policy change. The model specifically assesses how growth responses to effective tax rate changes differ for the treatment group in the post-event period compared to the baseline (control group before the event).

In Figure 8 and Table 7, we observe the impact of such a policy on firm growth. The results support our initial findings that higher corporate ETRs negatively impact firm growth and help alleviate concerns about the endogeneity in our empirical analysis, but with nuanced insights specific to the context of new firms and policy changes in Spain. Specifically, the green line shows that for the control group, the negative impact of corporate ETRs on growth (-158.544 in the baseline coefficient in Table 7) becomes more pronounced after the policy change (indicated by the dotted green line and by the interaction term Event * Corporate ETR in Table 7). This suggests a broader negative effect of the tax rate on firm growth, intensifying post-policy. The positive slope for the treatment group suggests that the tax rate reduction had a favourable impact on the growth of the targeted group of new, non-multinational firms in Spain. However, when the treatment group is defined in the same way but includes only micro firms, the results are still positive but become insignificant (the coefficient for the triple interaction term Event * Treatment * Corporate ETR), indicating a rather doubtful outcome of the tax reduction for micro firms. This could happen because there was also a general reduction in the corporate income tax (CIT) rate from 30% to 28% in 2015 (and later to 25%), rendering the tax reduction for micro firms that belong to the treatment group (new and not part of a company group) not pronounced enough or not sufficiently protracted in time.

Figure 8. Impact of Corporate ETR on Firm growth (the case of Spain)



Sources: Authors' econometric estimations

4 Summary and conclusion

Small firms (including micro-firms and SMEs) are well-known drivers and pillars of economic growth and innovation. Small businesses are the largest employers (95% of total employment in the EU), and their role is key during periods of deep structural changes, such as the ongoing green and digital transition. However, small businesses face specific hurdles to their development, including on the tax side, which some countries try to address by granting specific tax advantages. In this paper, we calculate the effective tax rate paid by firms, which takes into account specific tax advantages given to firms, including those related to their status and size. We calculate these rates by firm-size category for a sample of EU countries, considering two specific taxes: corporate income taxes (CIT) and social security contributions paid by employers, which represent labour taxes. Further, we analyse the impact of effective corporate taxation on firm-level turnover growth using econometric analysis and examine a specific case of tax reform implemented in Spain.

Our results reveal interesting patterns whereby the effective tax rates tend to follow a bell-shaped curve, increasing at first when going from micro to small firm sizes and then decreasing again when going from medium to large size companies. A similar pattern emerges when considering only the effective corporate tax rate or both effective corporate taxes and labour taxes together. This pattern has also been found in other geographical areas, as shown in Bachas et al. (2023), and is, in itself, not surprising. On the one hand, governments aim to favour entrepreneurship and usually grant tax breaks for new firms and/or small or very small firms, which can be progressively withdrawn after a given period of time or when the firm's activity reaches a certain level. On the other hand, very large firms may be able to minimize their tax burden through tax optimization, which can include cross-border operations and the use of tax loopholes through mechanisms such as debt shifting, transfer pricing, or the location of intangible assets (e.g., patents) in countries offering specific tax advantages. Tax optimization requires sufficient resources and specific natures of activity which are not available to small companies, as reported in the European Commission (2022).

Our econometric analysis indicates that a 1% increase in effective corporate taxation leads to a 2.6% decrease in firm turnover growth on average. The negative impact is much larger for new firms (4.1%) and is especially pronounced in Spain, where a 1% tax hike leads to an 8% decrease in turnover growth for new firms, followed by Italy and Belgium, with a corresponding 5% decrease. Micro firms are the most sensitive to the corporate effective tax burden, particularly in Southern EU countries, including Spain, Italy, Portugal, and Romania.

The bell-shaped curve of effective taxation means that micro and/or new firms may face specific disadvantages when aiming to expand their activity, which may require policy support. Yet, public interventions aimed at reducing such disadvantages are not necessarily successful, depending on their design. We illustrate this by considering the specific case of the corporate income tax reform adopted by Spain in 2015, which granted a reduced rate for newly incorporated entities. Although the tax reduction appeared significant at first glance, with a temporary reduction in the statutory tax rate from 30% to 15% while the general rate was reduced from 30% to 28% and 25% successively, our results indicate that while the reform was positive, its impact was not significant and failed to boost SMEs' activity during the period considered. Complementary descriptive analysis suggests that, despite the specific tax break offered to newly created businesses, micro and small firms paid higher effective taxes than medium and large firms, and this tax disadvantage amplified over time. Our analysis highlights the importance of considering firm size, age, and ownership characteristics, together with the effective impact of specific tax schemes, in evaluating the impact of these types of policies. While many countries offer tax incentives to new and micro firms, these businesses remain significantly affected by the tax burden, which puts them at a disadvantage compared to large firms.

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Table 1. Variable definitions and sources

Variable	Definition	Source
<i>A. Dependent variables</i>		
Firm growth	Firm operating revenue turnover growth calculated as follows: (turnover at t+1 - turnover at t) / turnover at t.	Own estimations using Orbis
<i>B. Firm and firm size characteristics</i>		
Corporate ETR	Firm-level variable calculated using taxation data from Orbis, encompassing both current and deferred taxes. The calculation is performed by dividing taxation by profits and losses before taxes. Three distinct sets of corporate ETRs are defined: the first excludes negative taxation values (such as refunds) and loss-making firms; the second includes negative taxation values but excludes loss-making firms; and the third includes both negative taxation values and loss-making firms. In all sets, the corporate ETR values are truncated to lie within the range of 0 to 1.	Own estimations using Orbis
Composite ETR	It combines capital and labour tax burdens based on a production function, with weights for labour and capital varying by firm size, country, and year. The capital part uses the average corporate ETRs by country, firm size, and year, weighted by total EBITDA at the same level. The labour part uses social security contribution rates estimated from the EUROMOD model, weighted by total employee expenses at the country, firm size, and year level.	Own estimations using Orbis and Euromod
Total assets	Firm total assets (log).	Orbis
Number of employees	Firm number of employees (log).	Orbis
ROA	Firm return on assets.	Orbis
Tangibility ratio	Firm ratio of tangible to total assets.	Orbis
Leverage	Firm leverage.	Orbis
Firm age	Firm age based on the variable "incorporation date" in Orbis.	Orbis
Cash ratio	Firm cash and cash equivalents divided by total assets.	Orbis
Newness	Binary variable equals to 1 if a firm is no older than two years; 0 otherwise.	Own estimations using Orbis
Firm size	Categorical variable for firm size, defined according to Eurostat's classification based on annual turnover.	Own estimations using Orbis
<i>C. Country characteristics</i>		
GDP per capita	The natural logarithm of GDP per capita (current US\$).	World Bank
GDP growth	GDP growth (annual %)	World Bank
Inflation	Inflation, consumer prices (annual %)	World Bank
Rule of Law	Captures perceptions of the extent to which agents have confidence in and abide by the rules of society.	World Governance Indicators

Table 2. Summary statistics

The table reports the number of observations, the mean and standard deviation, minimum and maximum of the main variables in the analysis. The variables are defined in Table 1 and the sample period is 2008-2019.

	(1)	(2)	(3)	(4)	(6)
	Observations	Mean	Std. deviation	Min	Max
Firm growth	14,570,208	60.70	198.3	-1	686
Operating revenue turnover	14,570,208	5,225,589	1.40e+08	1	6.24e+10
Corporate ETR	14,570,208	0.21	0.24	0	1
Total assets	14,570,208	12.83	2.01	0	26.05
Number of employees	14,570,208	1.57	1.31	0	13.19
ROA	14,570,208	-0.02	43.07	-148,738	4,173
Tangibility ratio	14,570,208	0.24	0.29	0	295.23
Leverage	14,570,208	0.96	111.07	-254.01	357,047
Cash ratio	14,570,208	0.16	0.57	-1,136	204.30
Firm age	14,570,208	14.16	12.19	0	814
GDP per capita	13,566,821	10.11	0.46	9.04	10.77
GDP growth	13,566,821	0.87	2.68	-7.19	8.20
Inflation	13,566,821	1.26	1.31	-1.16	6.21
Rule of Law	14,570,208	0.76	0.42	-0.02	1.55
Newness	14,570,208	0.12	0.33	0	1
Firm size	14,570,208	1.25	0.59	1	5

Table 3. OLS estimation of equation 1

The table reports coefficient estimates and standard errors (in parentheses) from the OLS estimation of equation (1). Dependent variable is Firm growth. The lower part of the table denotes the type of fixed effects. We cluster the standard errors at the firm level in all specifications. The ***, **, and * marks denote statistical significance at the 1%, 5%, and 10% level, respectively.

	(1)	(2)	(3)	(4)
	Firm growth	Firm growth	Firm growth	Firm growth
Corporate ETR	-147.491*** [43.471]	-176.989*** [41.374]	-147.206*** [43.463]	-157.725*** [44.455]
Total assets	-160.830*** [46.012]	-183.108*** [53.318]	-158.700*** [46.651]	-160.935*** [47.049]
Number of employees	-62.509** [29.425]	-72.523** [33.280]	-62.084** [29.356]	-60.758** [29.428]
ROA	0.011* [0.006]	0.014* [0.007]	0.011* [0.006]	0.011* [0.006]
Tangibility ratio	33.412 [21.947]	42.083* [23.873]	35.735 [22.747]	37.310* [22.622]
Leverage	-0.011 [0.007]	-0.012 [0.008]	-0.010 [0.007]	-0.011 [0.007]
Firm age	-4.694** [2.045]	-4.435 [3.007]		
Cash ratio	17.616** [8.552]	19.462** [9.027]	17.975** [8.715]	17.764** [8.484]
GDP per capita		65.991 [195.830]		
GDP growth		0.857 [2.769]		
Inflation		-0.582 [7.691]		
Rule of Law		15.801 [104.326]		
Observations	14,570,208	13,566,821	14,570,208	14,570,208
Adjusted R-squared	0.395	0.391	0.395	0.395
Firm	Y	Y	Y	Y
Country-year	N	N	N	Y
Industry-year	N	N	Y	Y
Standard errors	Firm	Firm	Firm	Firm

Table 4. Econometric estimation of Figures 3 and 4

The table reports coefficient estimates and standard errors (in parentheses) from the OLS estimation of the underlying regressions used to construct Figures 3 and 4. The dependent variable is Firm growth. The lower part of the table denotes the type of fixed effects. We cluster the standard errors at the firm level in all specifications. The ***, **, and * marks denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	(1) Firm growth	(2) Firm growth
Corporate ETR	-74.210*** [16.268]	-9.404 [129.865]
Newness	266.581*** [68.270]	
Newness * ETR	-868.016*** [330.123]	
Micro		705.292*** [119.326]
Micro * ETR		-166.913** [84.117]
Observations	14,570,208	14,399,859
Adjusted R-squared	0.395	0.198
Firm Controls	Y	Y
Firm	Y	Y
Country-year	Y	Y
Standard errors	Firm	Firm

Table 5. Econometric estimation of Figure 5

The table reports coefficient estimates and standard errors (in parentheses) from the OLS estimation of the underlying regressions used to construct Figure 5. The dependent variable is Firm growth. The lower part of the table denotes the type of fixed effects. We cluster the standard errors at the firm level in all specifications. The ***, **, and * marks denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	(1)
	Firm growth
Corporate ETR	15.046*** [3.491]
Belgium-Newness * ETR	-49.316*** [15.484]
Spain-Newness * ETR	-258.999** [131.255]
France-Newness * ETR	-8,307.05 [11,929.001]
Croatia-Newness * ETR	-10.224 [28.523]
Italy-Newness * ETR	-2,058.714*** [598.597]
Poland-Newness * ETR	-61.821** [25.301]
Portugal-Newness * ETR	-584.818*** [188.582]
Romania-Newness * ETR	-369.682** [171.066]
Slovakia-Newness * ETR	-130.167 [99.967]
Observations	14,570,208
Adjusted R-squared	0.395
Firm Controls	Y
Firm	Y
Country-year	Y
Standard errors	Firm

Table 6. Econometric estimation of Figure 6

The table reports coefficient estimates and standard errors (in parentheses) from the OLS estimation of the underlying regressions used to construct Figure 6. The dependent variable is Firm growth. The lower part of the table denotes the type of fixed effects. We cluster the standard errors at the firm level in all specifications. The ***, **, and * marks denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	(1)
	Firm growth
Corporate ETR	13.275** [6.660]
Belgium-Micro * ETR	-13.677 [12.802]
Spain-Micro * ETR	-56.675** [25.640]
France-Micro * ETR	-1,833.040 [2,328.623]
Croatia-Micro * ETR	8.466 [13.071]
Italy-Micro * ETR	-369.290*** [67.077]
Poland-Micro * ETR	-3.254 [13.964]
Portugal-Micro * ETR	-136.752*** [35.612]
Romania-Micro * ETR	-89.918*** [32.222]
Slovakia-Micro * ETR	-32.771* [19.443]
Observations	14,570,208
Adjusted R-squared	0.395
Firm Controls	Y
Firm	Y
Country-year	Y
Standard errors	Firm

Table 7. Econometric estimation of Figure 8

The table reports coefficient estimates and standard errors (in parentheses) from the OLS estimation of the underlying regressions used to construct Figure 8. The dependent variable is Firm growth. The lower part of the table denotes the type of fixed effects. We cluster the standard errors at the firm level in all specifications. The ***, **, and * marks denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	(1)
	Firm growth
Corporate ETR	-158.544 *** [48.621]
Event	61.928 [42.922]
Event * Corporate ETR	-388.927** [185.156]
Treatment	88.186 [64.579]
Treatment * Corporate ETR	-402.122** [204.162]
Event * Treatment	-737.471 [704.845]
Event * Treatment * Corporate ETR	1630.738 [2088.46]
Observations	5,651,606
Adjusted R-squared	0.325
Firm Controls	Y
Firm	Y
Country-year	N
Standard errors	Firm

List of abbreviations and definitions

BEFIT	Business in Europe: Framework for Income Taxation
BEPS	Base Erosion and Profit Shifting
CCCTB	Common Consolidated Corporate Tax Base
CIT	Corporate Income Tax
EBITDA	Earnings before Interest, Taxes, Depreciation, and Amortization
ETR	Effective Tax Rate
EU	European Union
EUROMOD	European Union Tax Benefit Microsimulation Model
GDP	Gross Domestic Product
HOT	Head Office System
NACE	Nomenclature of Economic Activities
OECD	Organisation for Economic Cooperation and Development
R&D	Research and Development
SMEs	Small and Medium sized Enterprises

List of tables

Table 1. Variable definitions and sources.....18

Table 2. Summary Statistics.....19

Table 3. OLS estimation of equation 1.....20

Table 4. Econometric estimation of Figures 3 and 4.....21

Table 5. Econometric estimation of Figure 5.....22

Table 6. Econometric estimation of Figure 6.....23

Table 7. Econometric estimation of Figure 8.....24

List of figures

Figure 1. Corporate ETRs by Firm Size.....7

Figure 2. Composite ETRs by Firm Size.....8

Figure 3. Impact of corporate ETR on Firm Growth: New vs Old Firms.....10

Figure 4. Impact of Corporate ETR on Firm Growth: Micro vs Larger Firms.....11

Figure 5. Impact of Corporate ETR on Firm growth of New Firms across Countries12

Figure 6. Impact of Corporate ETR on Firm growth of Micro Firms across Countries13

Figure 7. Annual Trend of Corporate ETR, Labour ETR and Composite ETR in Spain14

Figure 8. Impact of Corporate ETR on Firm growth (the case of Spain).....15

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