

# ETPF

## **Who bears the burden of corporate income taxation?**

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**ETPF Policy Paper 1**

## **Author Biography**

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### 1. Introduction

The question of who bears the burden of the corporate income tax is an important policy question, and views about the right answer differ widely. One view is that the corporate tax is borne by shareholders. Since people with high incomes usually hold a larger fraction of their assets in the form of shares, this would imply that the tax is progressive. Another view claims that the corporate income tax leads to a decline in wages and employment, which would suggest that a large part of the tax burden falls on employees. In this case, the corporate tax would not be more progressive than a tax on wages.

It is the purpose of this short paper to summarize what economic research has to say about corporate tax incidence. The key results are as follows: Most studies focus on the question of whether labour bears a significant share of the corporate tax burden and confirm that this is the case. The results suggest that wages decline by roughly 50 per cent of the additional corporate tax revenue raised. These effects can be observed in a time span of one to four years after the tax change.<sup>1</sup>

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<sup>1</sup> As always views about how the literature should be interpreted differ.

The setup of this short paper is as follows. Section 2 summarizes what economic theory has to say about corporate tax incidence. Section 3 turns to empirical studies which use data on taxes, profits, wages and other variables to investigate who bears the corporate tax burden. Section 4 concludes.

## **2. What does economic theory have to say about corporate tax incidence?**

The analysis of tax incidence investigates how the existence or the change of a tax affects the welfare of individuals in an economy. Since welfare is difficult to measure, studies of tax incidence often focus on how taxes change wages, interest rates, rents or product prices. It is one of the key insights of taxation theory that the legal obligation to pay the tax to the fisc (statutory incidence) may offer little guidance about who bears the economic burden of the tax. This is most obvious in the case of the corporate income tax. It is paid by corporations but they cannot bear the economic burden – this burden can only be borne by people, that is by owners, creditors, employees, suppliers or customers of corporations. Tax incidence is often measured by relating the tax burden to the revenue raised. This is a useful comparison, but one should note that the overall burden of most taxes will exceed the tax revenue because taxes usually have a distortionary effect.

### **2.1. The design of the corporate income tax matters**

Before starting to think about who bears the tax it is important to take into account that there are different ways in which a corporate income tax can be designed and fitted

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For a more skeptical view of the finding that labour bears a significant part of the corporate tax burden see Gravelle (2011) or Clausing (2013).

into the tax system as a whole. First, how does the corporate tax interact with the personal income tax? Depending on whether or not corporate taxes are partly or fully credited against personal taxes the incidence of the tax is likely to differ significantly. Second, the corporate income tax can have a narrow or a broad tax base. The design of the tax base will be of key importance for how the tax affects investment. The effect on investment, in turn, will be crucial for the impact of the tax on wages because investment matters for labour productivity.

Third, in an international context, a country may tax the worldwide profits of domestic corporations, providing credits for taxes paid abroad. Alternatively, the tax may effectively be restricted to domestic profits because foreign source income is tax exempt or the taxation of this income is deferred until repatriation. Fourth, state and local governments also levy corporate income taxes. Sometimes these taxes are deductible from federal taxes, and the profits of corporations operating in more than one state or local jurisdiction need to be apportioned for purposes of taxation. This is often done using formula based on wage bills, fixed capital investment or sales.

Most studies of corporate tax incidence abstract from corporate-personal tax integration, they assume that corporate taxes distort investment and neglect the taxation of foreign source income. Studies of state or local taxation do normally raise the issue of formula apportionment but at least in empirical studies of tax incidence formula apportionment does not seem to matter much.

## 2.2. Do shareholders bear the tax?

Since corporate income taxes reduce profits it is natural to think that the tax reduces dividends and is therefore borne by shareholders. This idea has clear implications for the incidence of the tax if corporations are directly owned by individuals. But the real world ownership of shares is more complicated. For instance, some corporations are owned by other corporations or shares are owned by pension or health insurance funds. If the fund offers a defined benefit plan a decline in dividends caused by a higher corporate tax may reduce the profits of the institution running the fund. This may be a financial services firm but it may also be a public sector institution. Shares may also be owned by universities or charitable foundations. In this case the burden of the corporate tax would ultimately fall on the donors, the beneficiaries or the employees of these institutions (Auerbach (2005)).

Another complication is that corporate tax changes may affect different groups of capital owners and shareholders very differently. For instance, many tax reforms in recent years have combined a cut in statutory tax rates with a reduction in the present value of depreciation allowances. This type of reform is likely to benefit owners of existing capital or corporations with a large stock of old capital while it puts a burden on corporations with large investment plans for the future. The reduction or abolition of investment tax credits would have a similar effect.<sup>2</sup>

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<sup>2</sup> Goolsbee (2003) finds that investment tax subsidies have had a positive impact on wages of workers in equipment industries, a case where the tax burden, or in this case, the benefit of a corporate tax subsidy, is shifted through suppliers.

### **2.3. Is the tax burden shifted to capital or labour? The closed economy case**

The view that the corporate tax is borne by shareholders is based on the assumption that the tax does not change wages, interest rates or output prices in the economy. Debates about how the corporate tax might change these variables and by doing so shift the tax burden usually start with Harberger (1962). He considers a model of a closed economy with incorporated and unincorporated companies and finds that, under plausible parameter values, capital owners in both sectors, not just in the incorporated and taxed sector, bear close to 100 per cent of the tax burden. The reason is that the corporate income tax induces capital to flow to the unincorporated sector until the rates of return to capital are equalised.

Harberger's analysis is based on a number of strong assumptions, in particular the assumption of a fixed capital stock. What happens if it is taken into account that savings may decline if the after tax return to capital falls? While Harberger (1962, p.236) argues that his results would not change much, other authors study this issue in growth models where savings react to taxation and find that the corporate tax reduces the capital stock so that the productivity of labour declines. This implies that a substantial part of the corporate tax burden will be shifted to labour.<sup>3</sup>

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<sup>3</sup> See Feldstein (1974) and Ballentine (1978).

## **2.4. Tax incidence in open economies: does the tax burden fall on immobile factors?**

Another important assumption made in the Harberger (1962) model is that the economy is closed. In open economy models where capital is mobile and corporate taxes are levied according to the source principle<sup>4</sup>, the incidence of the tax is different. In the polar case of an open economy which is too small to significantly affect prices in world capital markets, the after tax return to capital is fixed and independent of domestic taxes. If such a country raises the corporate income tax, domestic investment declines and the before tax return to the marginal investment project rises until the after tax return equals the rate required by international investors. This implies that the corporate tax burden is fully shifted to immobile factors of production or immobile rents.

Models of larger open economies, in contrast, predict that a higher corporate tax in one country will trigger a capital flow to other countries and reduce the worldwide after tax rate of return to capital. In this case domestic immobile production factors bear part of the tax burden but capital owners also lose. In contrast, owners of immobile factors in other countries, which experience a capital inflow, benefit.

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<sup>4</sup> The tax systems of most countries are based on the principle of worldwide personal and corporate income taxation. However, in practice the corporate tax is largely source based because many countries either exempt foreign source income from domestic corporate taxation or they defer taxation until repatriation. Worldwide taxation is implemented somewhat more stringently when it comes to personal income taxation, but again tax exemptions for certain types of investments like pension saving are widespread.



In general open economy models predict that ‘the smaller is the country, state or locality imposing the tax relative to the world or domestic economy...the larger is the burden on immobile factors.’<sup>5</sup> These immobile factors include immobile labor or land. But they may also take the form of natural resources or access to a local market where imperfect competition gives rise to profits.

The fact that consumers tend to be less mobile than capital or tradable goods, especially at the international level, raises the question whether the corporate tax may be shifted to customers, through higher output prices. This would be possible if the corporate tax raises marginal costs and goods produced domestically cannot easily be replaced by goods produced abroad.

If it is true that, in open economies, the corporate tax is partly shifted to immobile factors, how large can we expect this burden to be? Although this is essentially an empirical question some theoretical studies use computable general equilibrium (CGE) models<sup>6</sup> to shed light on this issue. For instance, Randolph (2006) considers a model of two large open economies where capital is internationally mobile while labour is immobile. The worldwide supply of capital is fixed. He considers the introduction of a corporate income tax in the domestic economy and finds that domestic labour income declines by roughly 74% of corporate tax revenue while domestic capital income declines by 33%.<sup>7</sup> Domestic labour

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<sup>5</sup> Kotlikoff and Summers (1987), p. 1066-67.

<sup>6</sup> Essentially these are numerical models with parameter values taken from empirical studies, which are calibrated to fit real world data.

<sup>7</sup> See Randolph (2006), table 3, p.57. Foreign labour income increases by 71% and foreign capital income falls by 72% of the domestic tax revenue raised. From a worldwide perspective, in turn, overall labour income does not change much

bears a much larger part of the tax burden than domestic capital. Gravelle and Smetters (2006) use a similar CGE model but assume that domestic and foreign goods cannot easily be substituted. This limits the extent to which the domestic corporate tax induces a capital flow to the foreign country. As a result labour bears a much smaller part of the tax burden of just over 20 per cent. The assumption of limited substitutability is criticized by Harberger (2006), who argues that, in an open economy context, labour is likely to bear 100% of the corporate income tax.

## **2.5. The role of labour market institutions and rent sharing**

While it is intuitive that a change in investment caused by higher corporate taxes can have an impact on jobs and wages the effects of the corporate tax on employees may be more complex. In particular, various labour market theories imply that there is a direct link between after tax profits and wages, which is independent of changes in investment. Firstly, if unions play a role wages and sometimes even employment may be set through collective bargaining. Most collective bargaining theories imply that wages will be higher where profits are higher and vice versa. This would suggest that the burden of corporate taxes is shared by employees, in particular employees with a lot of bargaining power. Secondly, other labour market theories, in particular search theory, emphasize wage bargaining between individual employees and their employers. Thirdly, fair wage theories suggest that wage setting is influenced by fairness norms. These norms would require firms with high profits to offer higher wages

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and the tax is borne entirely by capital. This is not surprising, given that the world economy is modelled essentially as the closed economy in Harberger (1962).

than less profitable firms, so that a direct link exists between (after tax) profits and wages.<sup>8</sup>

## **2.6. Incidence effects unfold over time**

The theories discussed so far abstract from the fact that some types of economic adjustments caused by tax changes take time while others can happen very quickly. For instance, it is plausible that a higher corporate tax leads to a decline in investment at home and more investment abroad, so that the income of domestic immobile labour declines and wages fall. But these adjustments will take time. Firms may start to change their investment plans as soon as the tax change is announced, but putting them into practice may require months or even years. Other adjustments, in contrast, may happen very quickly. Asset prices will usually adjust immediately. To the extent that workers participate in the surplus generated by a company through wage bargaining, tax changes will affect the bargaining outcome in the round of wage negotiations after the tax change has been announced. This may happen within weeks or months.

## **3. What can we learn from empirical studies?**

The fact that economic theory identifies many potential victims who might bear the burden of corporate taxation suggests that empirical studies are of key importance to understand the incidence of the tax. But attempts to measure corporate tax incidence empirically face a number of challenges, and so far views about what we can learn from the empirical

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<sup>8</sup> The distinction between the indirect effect of corporate tax changes on wages, which is transmitted through the change in investment caused by the tax change, and the direct effect explained here, is important for empirical estimates of corporate tax incidence, see Arulampalam et al. (2012).

literature are divided. The empirical literature focuses almost entirely on the question of whether the burden of corporate taxes falls on labour income.

It is helpful to distinguish three types of studies. The first group exploits differences in corporate taxes across countries. The second type uses corporate tax differences across states or local governments. The third type of studies uses variation in tax burdens at the sector or firm level.

### **3.1. International differences in corporate taxes**

The study by Hasset and Mathus (2006) belongs to the first group and compares wages earned in manufacturing for 72 countries between 1981 and 2002. The paper investigates whether (top) statutory corporate tax rates are an important factor explaining how wages differ between countries and how they develop over time. They find that there is a significant negative correlation between taxes and wages and conclude that 'a 1 per cent increase in corporate tax rates is associated with a 1 per cent drop in wages'.<sup>9</sup>

This result has been criticized for a number of reasons. Firstly, the magnitude of the effect seems implausibly large. If the share of wages in GDP is equal to approximately 60 per cent and corporate tax revenue is three per cent of GDP, the estimates of Hasset and Mathus (2006) would imply that collecting one dollar of corporate tax revenue would reduce wages by roughly 20 dollars. Secondly, it has been claimed

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<sup>9</sup> Hasset and Mathur (2006), p. 25. In a more recent study with a slightly different dataset and econometric approach the same authors argue that a one percent increase in the corporate tax leads to a decline in wages by 0,5 per cent, see Hasset and Mathur (2010).

that the results are not robust to changes in the model specifications. For instance, Gravelle (2011) argues that the results are much smaller if the wage data is corrected for differences in purchasing power. Third, Hasset and Mathus (2006) included value added as a control variable, which means that they shut down the impact of changes in capital intensity on wages in their regressions. Since this is the main channel they seem to have in mind, their results are difficult to interpret. Fourth, the correlation between corporate tax rates and wages does not establish that higher taxes cause lower wages. For instance, it may be that countries enjoying a period of economic booms with high wage growth often cut corporate taxes because the public sector budget is in surplus.

Another study which uses international tax differences and aggregate wage data is Clausing (2013). Her analysis focuses on OECD countries because they are more comparable and considers the time period 1981-2009. The analysis confirms a positive relationship between capital intensity and wages but not between corporate tax rates and wages. She concludes that her results 'suggest skepticism regarding prior claims that labor will bear a large share of the burden of a corporate tax in a global economy.' (Clausing (2013, p. 167)).

While these studies use aggregate wage data and statutory or effective tax rates, other studies use household or firm level data. For instance, Felix (2007) uses wage data from household income surveys. Five waves of data are available, for the time period 1979-2002. However, not all countries are represented in all five waves. Using household data allows to investigate, among other things, whether the incidence of the corporate tax differs across skill levels. Felix finds that the decline in wages in response to higher taxes is equal to more than four times corporate tax revenue raised. Again, this

is a very large effect.<sup>10</sup> The incidence does not vary systematically across skill levels, though.

### **3.2. Corporate taxes at the state and local levels**

The second type of studies uses variation in corporate taxes of state and local governments. Felix (2009) uses individual household data for wages and investigates whether differences in corporate tax rates across states and over time have an impact on wages. The results suggest that a one percentage point increase in the state corporation tax rate reduces wages by between 0,14 and 0,34 per cent. Gravelle (2011) argues that this implies a decline in wages of up to 360 per cent of the tax revenue raised.<sup>11</sup>

A study of corporate tax incidence which uses variation in taxes at the local level is Fuest et al. (2013). They investigate the impact of local corporate taxes in Germany, where municipalities have autonomy in setting the tax rate. This study uses administrative employer employee matched data. With this data it is possible to take into account that the impact of corporate tax changes may depend not just on characteristics of employees (like skill levels) but also on characteristics of companies. It turns out that this aspect is important. In

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<sup>10</sup> Desai Foley and Hines (2007) use firm level data and focus on US wages and profits of multinational companies. They argue that their approach measures the relative share of labour income and profits in the overall corporate tax burden and find that labour bears 57 per cent of the burden.

<sup>11</sup> Carroll (2009) also looks at the impact of state corporate taxes and finds that wages fall by 250 per cent of the tax revenue. Felix and Hines (2009) study how state corporate tax changes affect the gap between union and non-union wages and find that a one percent increase in the tax rate reduces the union wage premium by 0,36 per cent.

particular, to what extent changes in corporate taxes affect wages seems to depend on the wage setting institutions, which differ across firms.

It turns out that higher taxes reduce wages in firms where wages are set via collective bargaining while the wage effects in other firms are negligible. Within the group where collective bargaining plays a role, effects are largest in firms where bargaining takes place at the firm level. In firms where bargaining takes place at the sectoral level the effect is much smaller. On average wages decline by 77% of the corporate tax revenue raised.

This effect is measured controlling for value added, which implies that the wage effect of changes in investment caused by the tax change is neutralized. The measured wage effect can therefore be interpreted as reflecting rent sharing, i.e. the fact that employees get a share of the overall surplus produced by the company, as explained in section 2.4.

### **3.3. Tax differences between firms and industries**

The third group of empirical studies in the literature on corporate tax incidence exploits differences in the tax burdens between firms or industries. For instance, if the tax system allows for accelerated depreciation, a company with large expenditures on new machinery may have zero or even negative taxable income whereas a similar company which invests less may have positive profits and pay higher taxes. Accordingly, these firms will be affected very differently by changes in tax rates or allowances. Arulampalam et.al (2012) use firm level data from nine European countries to investigate whether the tax paid by a company affects wages

in the same company.<sup>12</sup> They also focus on the direct effect of corporate tax changes on wages and find that an increase in the tax payment of the average firm by one Euro reduces wages by 49 cents.<sup>13</sup>

Liu and Altshuler (2013) use industry level data to measure the incidence of the corporate tax on wages in the US. They focus on the marginal effective tax rate. The main result of the paper is that, on average, an increase in the corporate tax burden by one dollar reduces wages by 60 cents.

#### **4. Conclusions**

What does economic research have to say about the incidence of the corporate tax? Theoretically the tax could be borne by shareholders, creditors, employees, suppliers or customers of corporations. Most studies, though, focus on one question: Does labour bear a significant part of the tax burden? Although there are diverging views about how this should be measured, the answer to this question is almost unanimously yes. There is less agreement about how large the effect is. A conservative reading of the available evidence would suggest that raising additional revenue through the

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<sup>12</sup> This approach raises a number of statistical issues that need to be taken into account. For instance, it may be that a company experiences a surge in demand for its products payments, which leads the firm to invest more and raise wages. If the additional expenses reduce taxable income, taxes decline and wages rise but the lower tax payments do not cause the wage rise. The authors acknowledge this and use instrumental variables to deal with this issue.

<sup>13</sup> Dwenger et al. (2011) use variation in firm specific average effective tax rates in Germany to estimate corporate tax incidence. They find smaller effect, where the decline in the wage bill (including changes in hours worked and employment) is between 19 and 29 cents.



corporate income tax comes at the cost of a short to medium term decline in wages of at least 50 per cent of the additional revenue raised. This is an average number that may hide considerable heterogeneity. The incidence may differ across countries, industries, firms and employees.

Of course, the overall cost of raising revenue through the corporate income tax is higher than 50 per cent of the revenue and probably even significantly higher than one hundred per cent. Therefore more research is needed to complete our understanding of who bears the corporate income tax.

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## **About ETPF**

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The ETPF is a registered UK charity. The charitable purpose of the ETPF is to advance the education of the public in the area of European tax policy development by commissioning academic research into European tax policy issues and publishing the useful results of such research, and by holding public forums on European tax policy.

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