



Ten years on from the business tax reform: how has it affected companies' behaviour?

In 2010, the French corporation tax known as the local economic contribution or CET (*contribution économique territoriale*) replaced the business tax (TP – *taxe professionnelle*). This latter tax on production had come under frequent criticism because it hampered companies' competitiveness and productivity, particularly because the tax base included non-real estate assets. These assets are now excluded from the tax base. This article looks at the effects of that reform, which had a significant impact on companies, whose activity has increased as a result. While the introduction of the CET reduced the marginal cost of investment in equipment, companies' capital intensity has not increased, the rise in employment having been more or less proportional to that of investment. But by harmonising the different tax rates, which had caused variations in the local cost of capital, the reform enabled companies to better allocate their production factors and improve their competitiveness.

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JEL codes
H25, H32,
D22

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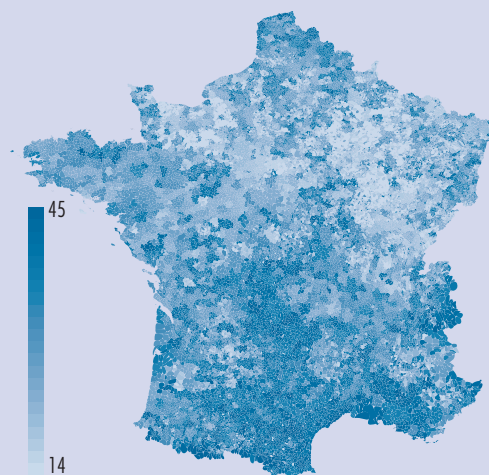
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3.0 percentage points
average difference in the marginal tax rate between two neighbouring municipalities before the reform

4.5%
estimated share of the business tax burden on the labour factor before the reform

-0.5 percentage point
decrease in the amount of local tax per unit of value added following the reform

Geographical breakdown of the marginal business tax rates before the 2010 reform



Source: Bergeaud et al. (2019).



1 Taxation on production in France: successive reforms to contain a historically high level

France has long set itself apart through a high level of taxation on production. These taxes represented, for example, 3.6% of companies' value added in 2016 compared with 0.5% in Germany, ranking France as the second highest country for this type of tax in Europe after Greece (Martin and Trannoy, 2019). But such taxes are generally considered harmful to the economy because of the distortions they engender along the production chain. In fact, because they penalise productivity and competitiveness, they influence companies' methods of production. Since the early 2000s, one government after another has tried to reduce these taxes, as illustrated in particular by the successive reforms of the *taxe professionnelle* (TP – business tax).¹ This article looks at the effects of the removal of this tax and its replacement with the CET.

The business tax before 2010

The business tax was introduced by the law of 29 July 1975, which simultaneously abolished the "patente" taxes in place since the end of the eighteenth century.² Initially, the business tax was applied using a composite tax base that included: (i) the company's receipts; (ii) the rental value of its real estate assets liable for property tax; (iii) the rental value of its equipment and moveable assets; and (iv) its wages. In 2003, the wage

component was excluded from this tax base because of its harmful effects on employment.

Until 2009, the three components – receipts, rental value of real estate assets and rental value of equipment and moveable assets – could be accrued based on a complex mix of factors (see Table 1), sometimes leading to significant threshold effects. The general tax base penalised investment because the rental value of equipment and moveable assets and of industrial buildings subject to property tax was a direct function of their cost price. The business tax affected in particular those sectors with high capital intensity (with the highest ratio of investment to value added) despite an applied ceiling. The manufacturing, energy and transport sectors paid nearly 66% of the business tax, while they represented less than 35% of the total taxable profits of all companies.

The marginal rates were set by the various local authorities (municipalities, groupings of municipalities, departments and regions). Because of the variations in these rates, a distortion of competition could occur between companies depending on where they were located, even between two neighbouring municipalities. For example, according to the Fouquet report (2004), for a profit-making company carrying out a ten-year investment, the additional cost of the business tax calculated nationally (weighted average rate) was 16%, while in Lower Normandy it averaged 12.6% and in Languedoc-Roussillon it averaged 21.6%.

T1 Business tax scales applied until 2009 by type of company

Activity type	Regime of tax on profit	Company with fewer than 5 employees	Turnover above EUR 61,000 (PS) or EUR 152,500 (sales)	Components of the tax base
Commercial, industrial, small-scale			No Yes	VLF only VLF + EBM
Non-commercial or business agent/trade intermediary	IT	Yes		VLF + receipts
	IT	No	No	VLF only
	IT	No	Yes	VLF + EBM
	CT		No	VLF only
	CT		Yes	VLF + EBM

Source: Fouquet report (2004).

Notes: Business tax base calculated on the type of tax on profits, employment and turnover.

IT: income tax; CT: corporate tax; PS: production of services; VLF: rental value of real estate assets; EBM: rental value of equipment and moveable assets.

Key: A commercial company with turnover of over EUR 152,500 will have to pay a production tax for which the tax base comprises the rental value of real estate assets and the rental value of equipment and moveable assets.

¹ Before the abolition of the business tax in 2010, the reform that took place in 1999 led to the gradual removal of the wage component from the tax base between 2000 and 2002 and of the share of cap mechanisms in 2007.

² <https://www.economie.gouv.fr/saef/patente>



This dispersion of rates throughout the country meant there was a significant disparity in the business tax burden within any given sector.

2010 reform of the business tax

Under the 2010 reform, the business tax was replaced with the *contribution économique territoriale* (CET – the local economic contribution), which comprised the *cotisation sur la valeur ajoutée des entreprises* (CVAE – value added contribution for companies) and the *cotisation foncière des entreprises* (CFE – real estate contribution for companies).

- The CVAE rate is defined at national level and replaced the *cotisation minimale de taxe professionnelle* (CMTP – the minimum contribution to business tax), a supplementary component of the business tax. Companies with turnover of over EUR 152,500 must pay the CVAE. The effective rate can vary between 0% and 1.5% depending on turnover, but it is not dependent on location.
- The CFE contribution draws on a local real estate tax base and is applied to assets subject to property tax (buildings or undeveloped land) used by the company for its business activity during the financial year. It does not take equipment and moveable assets into account.

Consequently, the reform led to a harmonisation of marginal rates for one part of the tax as well as a change in the tax base. It was introduced chiefly for economic purposes to strengthen companies' competitiveness by removing their investment in production from the tax base. In budgetary terms, the share of tax on production paid by companies fell sharply from 1.1% to 0.8% of GDP between 2009 and 2010.

2 How do we assess the impact of this reform?

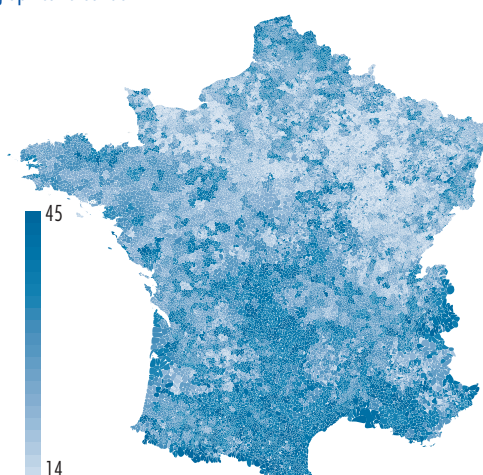
The business tax was reformed at the same time for all French companies. To assess the reform's effects, therefore, we must look at the variations in its significance at the level of each company. To this end, we examined the significant variability in tax rates before 2010 and the differences in the size of the tax base.

Taking advantage of the geographical differences in rates

The business tax rate applied to the rental value of real estate assets and equipment assets was made up of a component set by the municipality and a component set by higher-ranking administrative and geographical levels of authority. It could change each year but was subject to several constraints to prevent excessive tax competition between neighbouring municipalities.³ Nevertheless, Charts 1a and 1b show that this method of setting the tax led to significant differences based on location.

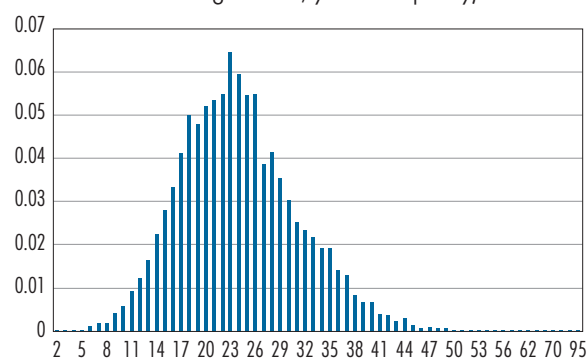
C1 Geographical breakdown and statistical distribution of the marginal business tax rates before the reform

a) Geographical breakdown



b) Statistical distribution

(x axis: value of the marginal rate; y axis: frequency)



Source: Bergeaud et al. (2019).

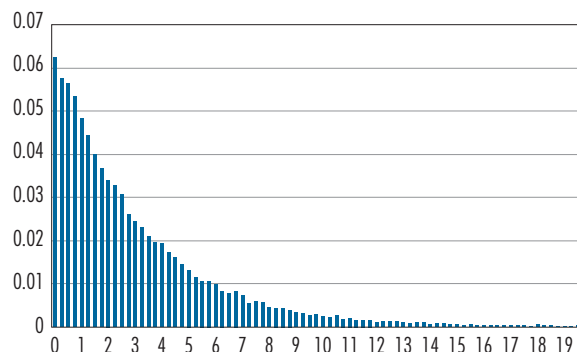
Note: The map represents the value of the marginal business tax rate per municipality in mainland France in 2008, for which the bar chart follows. The marginal business tax rate is applied to a base comprising the rental values of moveable and real estate assets.

³ In particular, the rate could not exceed twice the national average tax rate of the previous year, and year-on-year changes were limited to 1.5 times the change in the local residential tax. Generally speaking, the business tax level was set after the other local tax levels such that it balanced the municipality's accounts.



C2 Distribution of the difference in business tax rates between neighbouring municipalities

(x axis: percentage points; y axis: frequency)



Source: Calculations by the authors using official rates.

Note: Distribution of the difference in marginal rates between the municipality and the average of its neighbouring municipalities in 2008 (in absolute value). The marginal business tax rate is applied to a base comprising the rental values of moveable and real estate assets.

Chart 2 shows the average difference in rate (in absolute value) between each municipality and those bordering it. It was 3.0 points before the reform, much higher than the year-on-year change in rates (0.83 point per year on average between 2005 and 2008).

Measuring exposure to the reform at company level

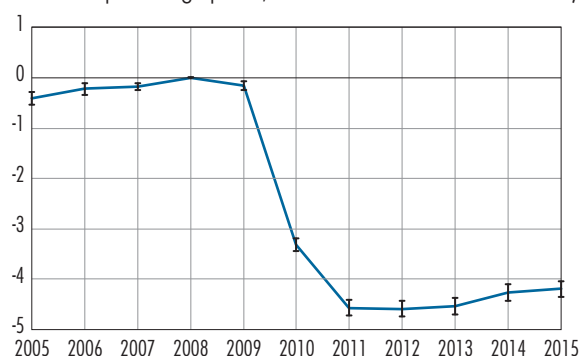
The intensity of the effect of the reform for a company depends on two elements: (i) its location at the time of the reform (which determines its marginal rate); and (ii) its capital intensity (which determines the share of the tax base that will disappear after the reform). This analysis uses an ex ante measurement of exposure to the reform used in different papers (see in particular Auten and Carroll, 1999), which is based on the predicted variation in the level of taxation were the tax base to remain the same as in 2008. An identification strategy based on this measurement aims therefore to remove the effects of the reform originating in a change in the tax base carried out in direct response to the reform.

Assessing the shock on companies' performance

To take into account the shock caused by the reform and assess its effect on companies' performance, we must show that the measurement we have built effectively predicts the change in the amount of local tax payable on production, as reported in the financial statements (business tax before 2009 and CET after 2009). Chart 3 shows the change in this amount each year between 2005 and 2015 for companies in the third most exposed to the reform compared with companies in the third least exposed to it.⁴ With the reform, we see a relative decrease of 0.5 percentage point (pp) in the local tax amount (business tax first and then CET) per unit of value added. The average value of this ratio being 2.5%, the companies most affected by the reform show a fall in the tax rate of 1.25 pp. The reform of the business tax therefore constitutes a significant shock for companies, whether in terms of cash flow or marginal cost of investment. This shock varies significantly depending on the companies' location and capital intensity.

C3 Ratio of the local tax rate to value added: difference between the most exposed and least exposed companies

(difference in percentage points, with a confidence interval of 95%)



Source: Bergeaud et al. (2019).

Note: Annual difference in the ratio of the local tax rate to value added for companies in the third predicted to be most exposed to the reform compared with companies in the third least exposed to it.

⁴ These groups were established using a standardised sector breakdown and Chart 3 represents the change in the ratio between the two groups each year in relation to the reference year 2008. This annual effect is calculated by eliminating the sector effects and invariant company characteristics. See Bergeaud et al. (2019) for more details.



3 How did companies react to the reform?

A range of possible reactions

The period covered by the available tax data (2005-15) can be used to analyse the response by companies in the short and medium term to this cash flow shock. More generally, it can be used to study the way in which the companies most affected allocated the reduced taxation arising from this reform. In theory, such a shock could have several effects:

- the cash flow shock could lead to an increase in the margin rate;
- the harmonisation of rates could give rise to a geographical reallocation of production factors;
- the reduced cost of capital relative to the cost of labour could give rise to an increase in capital deepening or a cut in prices by companies.

Simula and Trannoy (2009) propose a theoretical framework for examining the impact of the different types of tax on capital. In their view, the business tax prior to the 2010 reform heavily penalised investment. Rathelot and Sillard (2008) believe, however, that the local level of taxation had a relatively weak effect on

companies' choice of location. What then can we learn from the tax data presented in this article?

A correction of underinvestment in productive capital for companies that paid the highest tax before the reform

Firstly, we see a difference in the breakdown of costs between capital and labour before the reform in 2010, based on the business tax rate. To achieve this, we calculated the share of the cost of labour (s_{WB}), the cost of real estate assets (s_{KB}) and the cost of non-real estate assets (s_{KE}) for each entity. We then observed the correlation between the intensity of the business tax (defined as the logarithm of the marginal tax rate plus one) and these different relative costs. The results are presented in Table 2, in which the sector-based effects are firstly eliminated and then restricted to companies with multiple entities, while controlling using a company fixed effect.

The results indicate that companies invested less in equipment when the local business tax rate was higher. This result holds true for companies belonging to multiple-entity groups and when a company fixed effect is taken into account. This suggests that companies adapted their behaviour to the location of their most capital intensive (moveable assets) operations in line with the heterogeneous nature of the tax rates.

T2 Correlation between the intensity of the business tax in 2008 and production factor costs

	Cost of real estate assets s_{KB}	Cost of non-real estate assets s_{KE}	Cost of labour s_{WB}
Sector fixed effects			
Intensity of the business tax $\ln(1 + \tau)$	0.014** (0.006)	-0.102*** (0.018)	0.089*** (0.018)
R ² adjusted	0.104	0.180	0.180
Observations	501,709	501,709	501,709
Company fixed effects			
Intensity of the business tax $\ln(1 + \tau)$	0.006 (0.004)	-0.057*** (0.018)	0.051*** (0.016)
R ² adjusted	0.390	0.568	0.583
Observations	180,834	180,834	180,834

Source: Bergeaud et al. (2019).

Notes: Results of the estimates made using the ordinary least squares method of the tax rate (defined as the logarithm of the marginal local business tax rate plus one) on the relative shares of these costs for the entity. The data concern 2008. The first part of the table includes sector fixed effects. Standard errors are shown in brackets under the ratios.

*** value-p ≤ 0.01 ; ** $0.01 < \text{value-p} \leq 0.05$; * $0.05 < \text{value-p} \leq 0.1$.

R² measures the explanatory power of the model. Between 0 and 1, it grows in line with the quality of adjustment. Adjusted R² is used to compare models that do not have the same number of explanatory variables and/or observations.



Since one of the effects of the reform is the harmonisation of rates nationally, its main impact was to make this type of optimisation invalid, with a potentially positive effect on production through better allocation of production factors.

Impact of the reform on production factors

Finally, to assess the impact of the reform on a company's various production factors, we carried out a series of static linear regressions. The model entails regressing different dependent variables against the interaction between the instrument – the predicted effect of the reform based on untreated data – and a binary variable valued at 0 before 2010 and 1 afterwards. The coefficient associated with this interaction is presented in Table 3, in which each row corresponds to a dependent variable and each column corresponds to a set of fixed effects. These coefficients should be read as the long-term evolution (as a percentage) of the dependent variable when exposure increases by one unit. To give meaning to such an increase, it is worth noting that the measurement of the exposure to the reform is homogeneous at an effective rate of taxation. Its average value is 0.22. The interquartile deviation is 0.12. Accordingly, the predicted effect on turnover in the fourth column from a shift from

quartile 1 to quartile 4 corresponds to an increase of around 1.1%. In other words, two companies in the same sector and of the same size but whose capital intensity and location cause different exposures to the shock, will see their turnover diverge by around 1%.

The fact that capital increases when its cost decreases is not surprising and could indicate that the business tax caused distortions in the allocation of productive resources which were corrected by the reform (as suggested, moreover, in Table 2 above).

The positive response by sales could reflect an increase in the capital/labour ratio (capital deepening impact) which directly benefits the overall productivity of the factors. Additionally, the change in the labour factor, as measured by the total number of hours worked in the company, is the same as the change in capital. These results reflect more a uniform increase in the size of the company, resulting, for example, from a fall in prices linked to the decline in production costs. If we cannot measure such a fall empirically, we can evaluate it based on a theoretical prediction by retaining sales elasticity equal to -3 , as set out in other papers on the subject (see for example Aghion et al., 2019). In this case,

T3 Impact of the reform on production factors

	88 sectors	732 sectors	88 sectors and size	732 sectors and size
Turnover	0.148*** (0.016)	0.141*** (0.016)	0.096*** (0.016)	0.091*** (0.016)
Value added	0.187*** (0.016)	0.183*** (0.016)	0.117*** (0.016)	0.116*** (0.016)
Capital	0.123*** (0.021)	0.111*** (0.021)	0.101*** (0.022)	0.091*** (0.022)
Payroll	0.169*** (0.015)	0.165*** (0.015)	0.120*** (0.016)	0.113*** (0.016)
Hourly wage	0.019*** (0.005)	0.019*** (0.005)	0.018*** (0.006)	0.019*** (0.006)
Hours worked	0.150*** 0.015	0.146*** (0.015)	0.102*** (0.015)	0.100*** (0.015)
Observations	1,260,544	1,260,544	1,260,390	1,260,390

Source: Bergeaud et al. (2019), based on tax data.

Notes: The columns correspond to the inclusion of additional control variables: fixed effects at the level of the NAF division (88 sectors); fixed effects at the level of the NAF sub-division (732 sectors); fixed effects at the level of the NAF division and fixed effects for different job levels; and finally fixed effects at the level of the NAF sub-division and fixed effects for different job levels.

Results of the estimates made using the ordinary least squares method of the predicted value of the variation caused by the reform of the business tax in different variables defined as logarithms and shown in the first column. Each case corresponds to a different regression. Standard errors are shown in brackets under the ratios. *** value- $p \leq 0.01$; ** $0.01 < \text{value-}p \leq 0.05$; * $0.05 < \text{value-}p \leq 0.1$.

NAF: *Nomenclature d'activités française* (French classification of activities and products).



the 1% increase in sales mentioned above would correspond to a fall in prices of around 0.3%, with, however, a differentiated effect by sector, which may be amplified across value chains.

Table 3 above also shows a positive response in the payroll, essentially driven by an increase in the number of hours worked. Employee wages increase to the same extent as the increase in value added, implying that the wage component in value added remains stable. Based on this effect, we can assess the extent to which the business tax was underpinned by labour. Indeed, in the context of a standard labour supply model, the estimated effect of this tax on the hourly wage implies that only around 4.5% of the tax was passed on to the labour factor (see Appendix).

*
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The first observation from this study is that the companies that benefited most from the reform, due to their capital intensity or their location, saw an increase in their

activity together with an increase in sales and value added. Next, it shows an increase in the assets of the most exposed companies. However, although the reform significantly lowered the cost of investment in equipment, this increase is more or less proportional to the increase in employment. This is compatible with very low elasticity of substitution between capital and labour at a microeconomic (company) level. Lastly, the moderate effects on the hourly wage suggest that the labour factor represented only a small share of the impact of the business tax.

While this study shows us the microeconomic effects of the business tax by describing the changes in companies' performance, it is also true that the reform had effects at a macroeconomic level that are not taken into consideration in the empirical approach used here. By reducing the dispersion of the marginal tax rates on investment in equipment, the reform is likely to have increased the efficiency of capital allocation between companies and thus to have caused an increase in aggregate productivity (Hsieh and Klenow, 2009; Kehrig and Vincent, 2019).



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Appendix

Consider a model where workers have quasi-linear preferences, implying no revenue effect in the labour supply.

The function of company profit is written as follows:

$$\Pi = pY - wL - rK(1 + \tau),$$

where Y is the level of production, p is the price, and L and K are the quantity of work and capital, respectively. The cost of labour is w and the cost of capital is r . The business tax is modelled as tax τ , which comes in addition to the cost of capital.

We assume a slight variation in τ and its impact on the economic surplus W , which equals the sum of company profit Π and the surplus/indirect utility of workers $V = wL - g(L)$, where $g()$ is a function that captures

the disutility of labour. The change in the surplus is therefore written as follows: $dW = dV + d\Pi$. Envelope theorem implies:

$$dV = L \frac{dw}{d\tau} d\tau \text{ and } d\Pi = -\frac{dw}{d\tau} d\tau L - rKd\tau,$$

where we assume that r is not affected by the change in τ . We can rewrite $dW = -rK$.

The share of the impact on labour can be expressed as follows:

$$I_L \equiv \frac{dV}{dV+d\Pi} = \frac{\frac{dw}{w} wL}{\frac{dw}{w} wL - rK} = \hat{\beta}w \frac{\alpha_L}{1 - \alpha_L} \approx 4.5 \%,$$

where it has been assumed that the share of wages in value added is $\alpha_L = 0.7$ and where we use the coefficient $\hat{\beta}w = 1.9\%$ (see Table 3 above).

Published by
Banque de France

Managing Editor
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Translator/English Editor
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Technical production
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ISSN 1952-4382

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