Size-based regulations and firm growth: is small beautiful?

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Most countries treat smaller firms more generously when it comes to business regulation or taxation, exempting them from some of the burdens on larger firms. In France for example, a large number of regulations – primarily from labour laws, but not only – are binding when a firm has 50 or more employees. We calculate the overall costs of such regulations from observing companies' response to these "taxes on firm size" and obtain that they may depress economic output by over 3% in French manufacturing industries. Their costs are likely to be passed on to workers in the form of higher unemployment rather than lower equilibrium wages when the latter are rigid. By subsidising small and low productivity firms at the expense of larger firms, they also contribute to depressing aggregate productivity.

Economic growth has been sluggish worldwide in the last decade. Many factors are likely to contribute to this growth slowdown, most importantly falling productivity or lower population growth. It is also often argued that "red tape" (especially labour regulations) is an important contributing factor. However, the implicit costs and gains from regulations are both notoriously difficult to assess. In this issue of *Rue de la Banque*, we present the methodology that we use in our research (Garicano et al., 2016) to measure (essentially) the first component.[1]

The impact of regulations is not as easily quantified as taxes and spending, because they have no budget and no obvious accounting method: some laws are not enforced, while others have little impact because firms would follow them even without the force of a law. Most countries, however, treat smaller firms more generously when it comes to business regulation, exempting them from some of the burdens on larger firms. A recent example is the US Affordable Care Act ("Obamacare"), under which firms with 50 or less workers face lower penalties for failing to provide employee health insurance than larger firms. Portugal (Braguinsky et al., 2011) and Italy (Schivardi

and Torrini, 2008) also feature such size based regulations. The research in Garicano et al. (2016) uses this institutional feature to show how the overall costs of regulation can be calculated from observing companies' response to this "tax on firm size".

We rely on data from France where a large number of regulations are binding when a firm has 50 or more employees.[2] For example, enterprises must set up a "work council", offer union representation, have a profit sharing scheme, spend more on training and face higher constraints if they choose to downsize, etc. There are so many regulations that kick in at the 50 employee threshold in different bodies of laws (*Codes du travail, du commerce, de la sécurité sociale…*) that is it very difficult to draw an exhaustive account of all of them. It is even more difficult to assess which ones are binding or not, and at what cost to firms. Such

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1 *This is not to say that the second component is less important, but estimating it rigorously would require a different treatment, and further research.*

2 *There are some other regulatory thresholds, most notably at 10 and 20 employees, but we show in Garicano et al. (2016) that the 50 threshold is by far the most important one.*

regulations are intended to benefit and protect workers and society as a whole, but they might also discourage firms near the 50 employee threshold from growing larger and producing more output.

Figuring out the cost of the regulation

Chart 1 shows the number of manufacturing firms in each exact size category in the range between one and 1,000 employees. A striking feature of this graph is that the standard power law that characterises firm size distributions in virtually all countries[3] is in the case of France distorted by a mass point just above the regulatory threshold of 49, and by an area to the right of the threshold (between 50 and 60 workers) with fewer firms than what a Pareto distribution would have predicted. These patterns are clear evidence that the regulations are binding and affect firms' behaviour. But they do not provide a straightforward measure of the associated costs.

To do so, we rely on a simple Lucas (1978) span-of-control framework, which contains a theory of firms' size based on their productivity (managerial skills). In this model, a firm's size relative to others depends on its relative productivity, with most efficient or innovative firms having higher productivity and being larger. This positive covariance between firm size and productivity has been widely documented in the empirical literature (e.g., Bartelsman et al., 2013). But firm size can also be influenced by the cost of regulations, which act as a tax on employees of firms that starts at 50 workers. We back out the magnitude of this tax by modeling the way in which firms respond to such regulations.
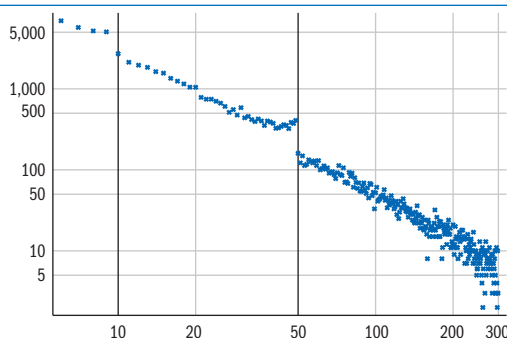
Firms that are really small are not directly affected by the regulation. But firms which would, for example, have chosen to have 50 employees without the regulation may instead choose to have 49 employees to avoid the tax. And the bigger the regulatory tax, the larger will be the mass of firms just below 50 employees and the dominated region in the firm size distribution just after 50 employees. Highly productive firms will always choose to grow and (consequently) absorb the cost of the regulation, but even these firms will tend to be slightly smaller than they would have been without the regulation since their labour costs are larger than without tax.

The precise shape of the distortions to the firm size distribution in Chart 1 is the key to calculating the regulatory tax. It is essentially estimated from the downward shift in the firm size distribution which is observed in the data for firms with more than 50 employees: this reflects the fact that the optimal level of employment for each firm below the threshold only depends on wages, while above the threshold, it depends on wages and the additional tax generated by regulations.

Regulatory tax across industries

According to our estimates, this tax turns out to be equivalent to adding about 2.3% to labour costs in the manufacturing industries. Table 1 shows that there is substantial heterogeneity across industries: our estimates reach a maximum of 3.5% in the transport industries but only 0.8% in the business services.[4] These contrasted patterns are most likely driven by the fact that different rules apply in different industries and "branches" (e.g., so-called "conventions collectives", etc.), which interact in non-trivial ways with economy-wide regulations.

C1 Firm size distribution in French manufacturing industries

(x-axis: level of employment, ln; y-axis: number of firms, ln)

Source: Garicano, Lelarge and Van Reenen (2016).

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[3] *This feature of firm size distributions has been well-known since the seminal work of Gibrat in 1931 and has been widely documented in the literature (Gabaix, 2016). The distinctive characteristic of power laws is that when plotted on a log scale (as in Chart 1), they boil down to a straight line.*

[4] *Ceci-Renaud and Chevallier (2010) apply the methodology proposed in Schivardi and Torrini (2008) to the same French data and estimate that the deficit of firms with 50 to 249 workers and with more than 250 workers is ca. 6-7% of the total number of firms in these size bins (0.06 and 0.1 ppt, respectively). Our own estimates are smaller and lie between 2.5% and 5% depending on the magnitude of wage rigidities. The difference is mostly explained by the fact that their statistical approach is equivalent to a partial equilibrium exercise, which does not allow for the general equilibrium (compensating) mechanisms that are described below.*

T1 Estimated implicit tax across industries

(%)

	Implicit variable tax
Manufacturing industries	2.3 (0.8)
Transport	3.5 (0.7)
Construction	2.0 (0.5)
Retail and Trade	2.6 (1.0)
Business services	0.8 (0.2)

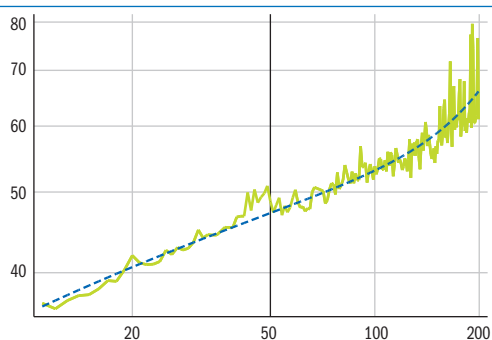*Source: Garicano, Lelarge and Van Reenen (2016).*
Note: Parameters estimated by maximum likelihood method, with robust standard errors clustered at the four digit industry level in brackets.

French firms mitigate the effect of these regulations by limiting the number of workers. Other strategies are also at work: they raise the number of hours worked (by employing fewer part-timers), substitute quality of work for quantity by increasing the fraction of skilled workers, increase their capital intensity by raising their investment spending and split themselves up into multiple legal entities smaller than the regulatory threshold. Our calculations suggest however that these additional avoidance strategies do not cause the overall costs to fall materially.

Our model also predicts that more productive firms should be clustered below the 50 employee threshold (compared to what would prevail in the absence of taxes). This is exactly what is observed in the data (Chart 2). More generally, the fact that more productive firms are not employing as many workers as they would have in the absence of the regulations implies that

C2 TFP distribution around the regulatory threshold of 50 employees

(x-axis: size (level of employment, ln); y-axis: average TFP, Levinsohn-Petri estimates)

Source: Garicano, Lelarge and Van Reenen (2016).
Note: This chart plots the mean level of TFP by firm employment size in manufacturing industries.

overall economic output and productivity will be lower. Many recent studies have emphasised how such failure to allocate production factors to more efficient firms is a major factor in holding back aggregate productivity (Hsieh and Klenow, 2009, Bartelsman et al., 2013). Quantifying this aggregate effect requires a thorough general equilibrium approach, to which we now turn to.

Wage adjustments and the incidence of regulations

Regulations are like taxes in another important respect – their incidence is not straightforward. A business tax levied on firms will ultimately end up being paid in the form of lower dividends for shareholders, higher prices for consumers or lower wages for workers. Similarly, some of the incidence of size based regulations will be felt in the form of lower economy-wide wages, since lower demand for workers puts a downward pressure on them. For firms, this lower wage is a benefit: it offsets the increase in labour costs driven by the regulatory tax so they do not reduce employment by as much.

The magnitude of this adjustment channel depends on real wage rigidities. If wages are fully flexible downwards then the increase in employment by smaller firms offsets the decrease in larger firms and there is no cost in terms of the overall number of jobs. The only inefficiency lies in the allocation of labour inputs to less efficient firms, such that aggregate output and productivity is negatively impacted, but only by a small amount.[5]

In France, however, the wage channel might be limited by rigidities such as the existence of a minimum wage or a large coverage of union agreements which prop up wages. Estimates from Aeberhardt et al. (2012) suggest that wages might only partially adjust, to 70% of the fully flexible case, which would imply that unemployment rates might increase. We calculate that this interaction between wage and regulations implies that output is reduced by around 3.4% and unemployment increased by around 2 percentage points in French manufacturing industries.

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5 *The precise quantification depends on the interpretation that is given to the amount levied by the regulatory tax. If the latter is to be interpreted as pure administrative waste, then the overall cost of the regulation is above 1% of output in manufacturing industries. If not (e.g., if it corresponds to the budget allocated to the firm council, etc.), then it is only 0.02% of output.*

Mandates that create costs for employers but nearly equal benefits for employees should not cause companies to change their size, because (barring wage rigidities) employers could pass on the costs of these regulations to their employees in the form of lower wages. The primary reason for size adjustments is that regulations create costs (for employers) that are significantly higher than the benefits that they generate for workers. The net effect of size-contingent regulations is therefore to subsidise small firms at the expense of larger firms and workers. It also makes it more difficult for small but productive firms to grow.

Policy implications

Our findings do not imply that the regulations imposed on 50-employee companies are necessarily excessive. Indeed, they can create public benefits and externalities that more than justify their net costs for an employer and his employees, like taxes and government spending. In this respect, our work does not allow for a thorough cost-benefit analysis of the regulations. However, looking at what firms actually do in response to such rules (rather than what they or others say they do) is a way of assessing the associated costs, which are to be weighed against their potential benefits.

In addition, our work shows that having a lot of small firms might point to the existence of harmful "barriers to growth". Chart 3 actually suggests that economies like those of Greece, Italy, Spain or Portugal might suffer from such problems. Such bias to small firms is costly since productivity rises with firm size (Chart 2). Yet the idea that small firms are best persists, which seems to owe much to the idea that small businesses create the most jobs. But a study by Haltiwanger et al. (2013) finds that young firms account for much of America's growth in jobs. Mature small firms often destroy jobs: it is better to be young than small.

C3 Distribution of employees by firm size (manufacturing industries, 2014)

(number of persons employed by size class of firms)
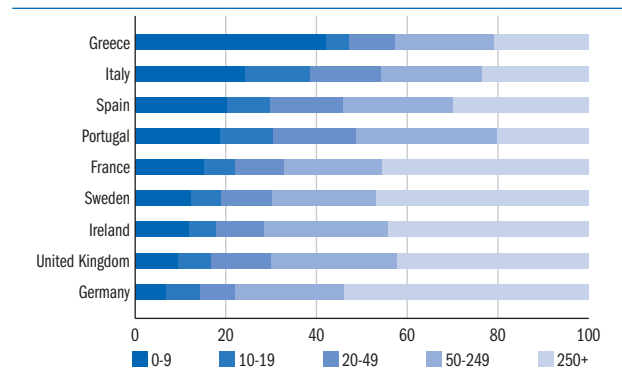
Source: Eurostat, Structural Business Statistics.

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