8.1. Which regulatory costs are associated with Portuguese firms' productivity?

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1. Motivation

The institutional setting of an economy, defined as existing legislation and its inherent costs, strongly impacts on the operation of firms in the different sectors of activity and on overall economic performance. Lloyd and Lee (2016) provide a survey of the recent literature on the importance of institutions for explaining cross-country differences in growth rates. Nevertheless, regulatory costs are often neglected or misinterpreted in micro-level analysis. One reason is the relatively scarce firm-level information on the evaluation of regulatory costs. Another reason is the lack of a clear and consistent definition, as well as a practical and exhaustive typology of regulatory costs and their impacts.

Figure 68 presents the main categories of regulatory costs, as suggested by the OECD (1997), and highlights that regulations affect virtually all agents in the economy, including the public sector and households. However, firms tend to concentrate most of the attention of the economic analysis of regulatory costs, due to their crucial role on the creation of employment and value added. The areas shaded in grey in Figure 68 correspond to different types of regulatory impacts on firms. Although specific types of regulations are not detailed in the diagram, it is straightforward to conclude that regulatory costs imposed on firms are quite diverse in nature, ranging from licensing procedures to the functioning of the judicial system, as well as labour market rules and ease of access to finance. The terminology used in the literature for the identification of such regulatory costs is diverse, including terms like "institutional costs", "red tape costs", "business environment" or "costs of doing business".

In this section, we discuss the relation between several regulatory costs and labour productivity of Portuguese firms, as developed in Amador *et al.* (2019). We use detailed data from the Business Costs of Context Survey (*Inquérito aos Custos de Contexto*, Portuguese acronym: IaCC) for 2014, a survey conducted by Statistics Portugal (INE). The

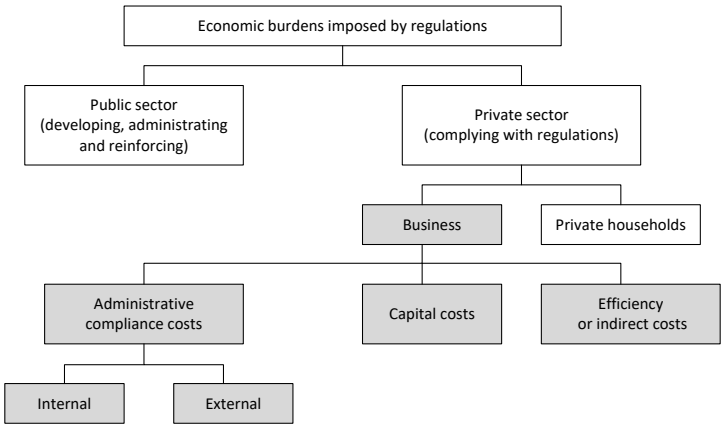


Figure 68: Main categories of regulatory costs
Source: OECD (1997), The OECD Report on Regulatory Reform.

survey covers nine domains of regulatory costs ("starting activity", "licensing", "network industries", "financing", "judicial system", "tax system", "administrative burden", "barriers to internationalisation", "human resources") and comprises several questions on the level of different obstacles within each domain. The questions on the level of obstacles have a qualitative nature, expressed in a scale of response with 5 levels: 1 - not an obstacle; 2 - very reduced obstacle; 3 - reduced obstacle; 4 - high obstacle; 5 - very high obstacle. There is also a complementary question on the importance of each of the nine domains to firms' activity.

INE (2015) provides an analysis of the main aggregate results and a detailed description of the methodology used in the survey. In 2018, INE published a second edition of the same survey (INE, 2018) and the results of both vintages are very similar. In both editions of the IaCC, around five thousand non-financial firms were asked about their perceptions on the level of different regulatory obstacles. The IaCC is based on a stratified random sample by size-class (defined in terms of employment and turnover) and main sector of activity. Hence, the sample is representative of the structure of Portuguese non-financial firms. For each individual question in the survey, an aggregate indicator (the obstacle indicator) is computed as the weighted average of all firms' responses along the 5 levels considered, thus ranging between 1 and 5.

Figure 69 presents the composite indicators for each of the nine domains of regulatory costs in 2014 and 2017 (computed as a simple average of the respective obstacle indicators), as well as the global indicator (computed taking into account the additional question that assesses the importance that firms assign to each of the nine areas of

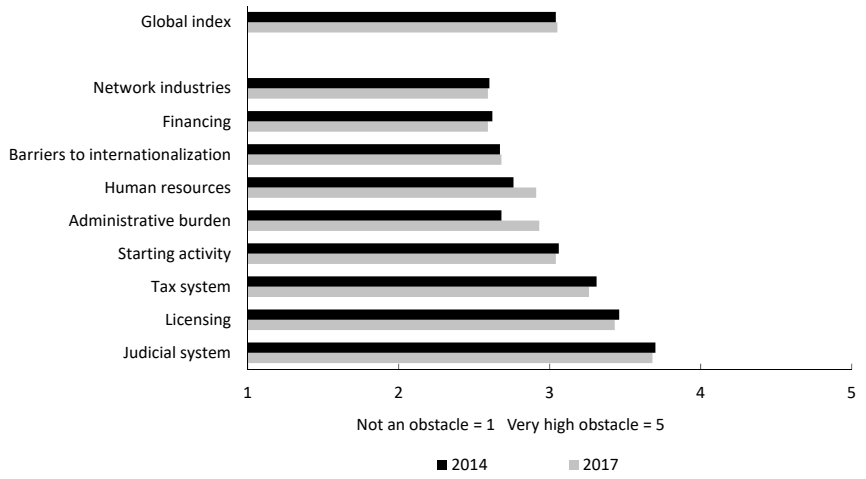


Figure 69: Composite indicators of the nine domains of regulatory costs in Portugal

Notes: The composite indicator for each of the nine domains of regulatory costs is computed as a simple average of the respective obstacle indicators. For more details, see INE (2015) and INE (2018).
Source: Statistics Portugal (INE).

regulatory costs to their activity, as well as their weight in the corresponding stratum in terms of turnover). The global indicator scored a value of 3.04 and 3.05 in 2014 and 2017, respectively, thus signalling an overall intermediate assessment of regulatory costs by Portuguese firms. In 2014, as for the domains of regulatory costs, the "judicial system" scores the highest obstacle index (3.7), followed by "licensing" and "tax system" (3.5 and 3.3, respectively).

2. Analytical framework

We use an Item Response Theory (IRT) procedure with a graded response model for ordered items to obtain the latent obstacle that is associated with each domain of regulatory costs for each firm (see Rasch (1980) and Birnbaum (1968) for seminal contributions on IRT methods). The distribution of the latent obstacle was standardised with mean zero and standard deviation equal to one. We implement also a partition of firms that corresponds to what they responded in the complementary question on the importance of each domain of regulatory costs to their activity. We grouped firms' responses to this question for each domain into two categories: "important", which corresponds to the two highest levels in the scale of answers (4 - im-

portant and 5 - very important); and "not important", corresponding to the remaining three levels (1 - not important, 2 - little importance and 3 - indifferent). This information was merged with the Integrated Enterprise Accounts System (*Sistema de Contas Integradas das Empresas*, Portuguese acronym: SCIE) to obtain information on firms' characteristics.

We run a set of descriptive regressions relating the regulatory obstacles with firms' performance. The regression for each of the nine domains of regulatory costs is:

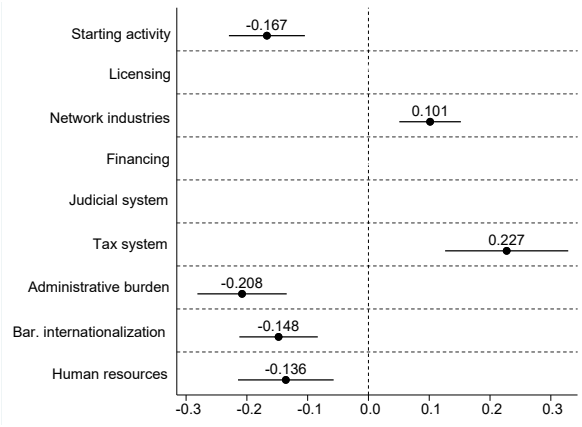
$$\log Y_{it} = \alpha + \beta_0 d_i + \beta_1 X_i + \beta_2 X_i \times d_i + \gamma_j + \gamma_t + \epsilon_{it}, \qquad (24)$$

where Y_{it} is labour productivity, in logs, of firm i in year t from 2010 to 2016. Labour productivity is defined as gross value added per worker. d_i is a dummy variable that takes the value one for firms responding that the domain of regulatory costs is important or very important to their activity in 2014 and zero otherwise, i.e., firms in the "important" category. X_i is the IRT latent obstacle that is associated with the respective regulatory cost for firm i in 2014. The interaction term in the regression allows for the link of the latent obstacle with the performance variable to differ between firms that consider the domain as important to their activity and those that don't. Sector and time fixed-effects are included in γ_j and γ_t, respectively. The control for the main sector of activity of the firm is defined at the *Classificação Portuguesa das Actividades Económicas* (CAE) 2-digit level, comprising 77 different sectors. ϵ_{it} is an error term robust to heteroscedasticity using the Huber-White variance estimator.

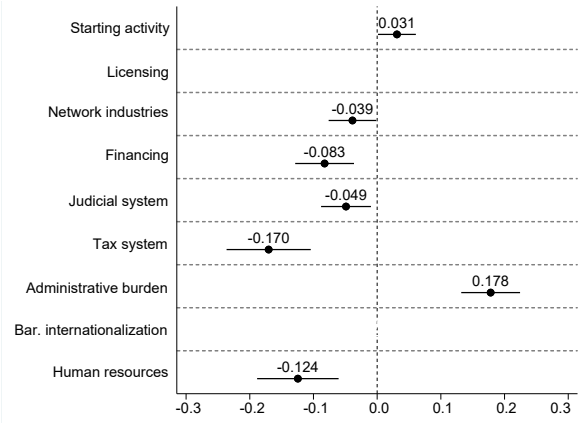
3. Regulatory costs and labour productivity

Figure 70 reports the results for weighted least squares regressions of Equation 24 using sampling weights, with labour productivity as the dependent variable.

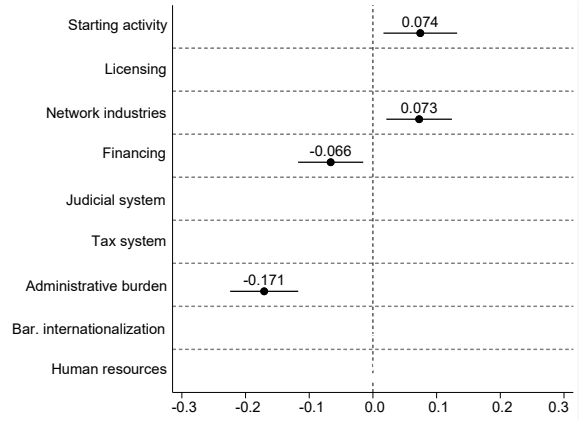
The coefficients of the importance dummy variable, β_0, measure the gap in average productivity levels between firms that consider the regulatory cost as important to their activity and those that don't, for a level of zero of the latent obstacle. For instance, the productivity gap between similar firms that differ only in their assessment of the importance of the regulatory cost to their activity is -18.78 per cent $(= 100 * (\exp(-0.208) - 1))$ in the case of "administrative burden" and -13.76 per cent for "barriers to internationalisation". For "starting activity" and "human resources", the estimated coefficient is also negative, while the opposite happens for "network industries" and "tax system".



(a) Importance dummy



(b) Latent obstacle



(c) Interaction term

Figure 70: Labour productivity (2010-2016), regulatory costs and their importance (2014)

Note: Only statistically significant estimates are presented. Horizontal lines correspond to 90 per cent confidence intervals.

The coefficient of the latent obstacle, β_1, is significant for all domains of regulatory costs except "licensing" and "barriers to internationalisation". In all significant cases with the exception of "starting activity" and "administrative burden", the coefficient is negative. This means that a higher level of the latent obstacle associates with lower average productivity for firms that do not consider the obstacle as important ($d_i = 0$). For example, a unitary increase in the latent obstacle of "tax system" is associated with a decline of 15.63 per cent of the average productivity of firms that do not see this regulatory cost as important.

The coefficient of the interaction term, β_2, captures the difference in the link of the level of the latent obstacle with productivity between firms that perceive the regulatory cost as important and those that don't. This coefficient is significant in four out of nine domains of regulatory costs. As for "starting activity" and "network industries" the coefficient is positive, while for "financing" and "administrative burden" it is negative. For example, in the case of "financing", a unitary increase in the latent obstacle is associated with an decline in average productivity of 7.92 per cent for firms that don't asses this domain as important and 13.83 per cent $(= 100 * (\exp(-0.0825 - 0.0663) - 1))$ for similar firms that consider it important.

Only obstacles related to "human resources" are identified as having a significant and negative relation in terms of both the importance to firms' activity and the level of the latent obstacle. As acknowledged in the literature, regulation on hirings and firings, security and health in the workplace and firms' access to specific competences and skills of workers seem to have a bearing on productivity. This result does not mean that barriers like, for example, judicial costs are not important, simply they are present irrespectively of firms' performance.

4. Final remarks

Regulatory costs exist in all economies and they are perceived as a blockage to firms' performance. As regulatory costs impact on firms' decisions, policy makers should design legislation so that negative effects are minimised, while public objectives are achieved. Implementing the best international practices can be a good approach but only if they are adapted to the domestic reality. In addition, frequent changes in the institutional framework impose a burden on firms as they consume resources in the adjustment process. In this section, we show that there is a significant negative association between most types of regulatory costs and firms' productivity. Therefore, while

maintaining the basic purpose of regulation, there is a case for reducing these obstacles as a way to promote Portuguese economic growth.

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