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Business Dynamics and Red Tape Barriers

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Abstract

Entry is a key element of the transmission mechanism through which product market reforms ultimately affect productivity and growth. Therefore, reforms aiming at facilitating firms' entry can be considered as giving an extra bonus in the sense that they facilitate the materialization of the full effect of other competition-enhancing reforms. By the light of these considerations, this study aims at estimating the impact of changes in the administrative cost of starting a business and/or exporting on entry dynamics in 17 European member countries (AT, BE, CZ, DE, DK, EE, ES, FI, FR, HU, IT, NL, PL, PT, SE, SK and UK) during the period 2004-2011. Results confirm the theoretical expectation: the higher the level of red tape barriers, the lower entry dynamics.

JEL Classification: D21; D22.

Keywords: business dynamics and red tape barriers, birth rates, cost of doing business.

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I. INTRODUCTION

The creation of new businesses and the decline or market exit of less productive firms are often regarded as key to business dynamism and economic growth. As a matter of fact, the existence of a positive link between the process of entry, reallocation of resources (within and between sectors) and macroeconomic growth⁽¹⁾ is quite established in the economic theoretical and empirical literature. According to the European Commission (2005), a 1% increase in the current entry rate leads to an increase by 2.10% in output growth, to a rise in labour productivity by 0.60% and to an increase in employment growth by 2.67%.⁽²⁾ That is why reforms in the area of product markets aim to improve their functioning often by creating better, easier conditions for firms to access them, operate, grow and exiting.

This business dynamic process is therefore an important aspect of the chain of events triggered by market reforms. It could be argued, indeed, that entry into a market is one of the key elements of the transmission mechanism through which product market reforms ultimately affect productivity: the entry of new firms, or the threat of it, induces existing firms to become more efficient by setting their prices closer to marginal costs and reducing mark-ups through reallocation of resources within the firm. In addition, less productive firms are supposed to be pushed out of the market, while more efficient ones grow and gain market share thus leading to further efficiency gains. Reforms aiming at facilitating firms' entry can thus be seen as giving an extra bonus in the sense that they facilitate the materialization of the full effect of other competition-enhancing reforms. They affect directly the cost of entry and are generally supposed to "quickly" influence business dynamics.

But to what extent does entry of firms respond to changes in the regulatory framework aiming at

reducing "red tape" entry barriers (administrative regulations and bureaucratic procedures to start a new business) and administrative cost to start operating in international markets?

Following the extensive empirical literature on the impact of business dynamics on productivity and growth, this study attempts to answer this question analysing the impact of changes in the cost and time needed to start a new business and operating overseas on EU Member States' sectoral birth rates.

More precisely, it firstly evaluates the extent to which these reforms have influenced entry dynamics in 17 European member countries (AT, BE, CZ, DE, DK, EE, ES, FI, FR, HU, IT, NL, PL, PT, SE, SK and UK) during the period 2004-2011 (that is the last year for which data on sectoral birth rates are available). It does it exploring the relation between sectoral birth rates (ratio between the number of new firms that entered the *sth* sector between *t* and *t+1* and the total number of firms in that sector) and changes in "red tape" costs, through a fixed effect model with country§or-specific time-invariant factors.

The main source of cross-country information on "red tape" entry barriers (proxied by the cost of starting a business, the number of procedures needed to start a business and the days needed to start exporting at time *t-1*) used in this study is the World Bank Doing Business dataset.⁽³⁾ This

(1) For instance, the entry of very high productive firms in a certain market may favour productivity-enhancing investment by incumbents interested in and trying to preserve their market power. Moreover, firms experiencing higher than average productivity growth are likely to gain market shares if the productivity gain goes along with upsizing, whereas they will lose market shares if their gain was driven by a process of restructuring associated, instead, with downsizing. Scarpetta et al., 2002.

(2) The aforementioned sectoral study covered 9 EU countries (France, Germany, Ireland, Italy, Portugal, Spain and the UK) over the 1997-2003 period.

(3) The Doing Business dataset presents quantitative indicators on the regulations that apply to firms at different stages of their life (regulations for starting a business, dealing with construction permits, getting electricity, registering property, getting credit, protecting investors, paying taxes, trading across borders, enforcing contracts and resolving insolvency). It focuses on small and medium-size companies operating in the largest business city of an economy. The indicators are limited in scope, so for instance, they do not measure the full range of factors, policies, and institutions that affect the quality of the business environment and which have an impact on business dynamics. Moreover, the indicators are developed around standardized case scenarios with specific assumptions. For instance, according to one of them the location of a business is the largest business city of the economy (while the reality is that business regulation and their enforcement very often differ within a country). Another example is given by the fact that in the standardized scenario, all firms are considered as limited liability companies or their legal equivalent. Finally, the Doing Business indicators assume that entrepreneurs have knowledge of and comply with applicable regulations,

records all procedures officially required, or commonly done in practice, for an entrepreneur to start up and formally operate an industrial or commercial business, as well as the time and cost to complete them and the paid-in minimum capital requirements. It also looks at the time, cost and documents necessary to export and import a standardized cargo of goods. It is worth stressing that these procedures include obtaining all necessary licenses and permits and completing any required notifications, verifications or inscriptions for the company and employees with relevant authorities. However, although this dataset is, due to the high level of homogeneity and annual data availability, the most common used source of information on the cost of doing business, it has a shortcoming that is particularly relevant for this study. The indicators provided are not directly linked to reforms, but are rather the outcome on the business environment of reforms streamlining and simplifying the cost of doing business in countries. Therefore, they should be considered a measure of the level of business regulations in a MS.

Secondly, given that several Member States have been recently introducing reforms aiming to facilitate entry and reduce administrative burdens, the results of the econometric analysis are used to predict the extent to which birth rates may change if a certain decrease in red tape costs occurred after 2011. This out of sample prediction is carried out for Italy, Portugal and Spain.

The paper is organized as follows. Chapter 2 briefly reviews the relevant literature, and chapter 3 presents the database used, some descriptive statistics of the variables of interest and the adopted econometric strategy. Chapter 4 presents and discusses the results, and chapter 5 concludes.

implying that they are limited to the formal sector (which limits the explanatory power of the indicators in countries characterized by a strong informal sector).

II. LITERATURE REVIEW

Enhancing competition through policies that aim at improving the functioning of product markets by deregulating and facilitating entry is generally considered a fundamental channel through which stimulating business dynamics and, through it, firms' productivity performances (Nicoletti and Scarpetta, 2003).

In fact, the existence of business opportunities alone does not result in the recognition and implementation of new firms (Audretsch *et al.*, 2006). Realistically, barriers to entrepreneurship may impede or even pre-empt the entrepreneurial reaction to business opportunities, implying that the capacity to generate entrepreneurial activity and business dynamism are specific to each country context. As the existing regulations are often a heritage of the past, the framework conditions which shape the environment in which firms operate may not always be optimal. They may even act as a brake, rather than spurring economic activity, and stifle initiatives, rather than encourage them.

A rising body of literature and empirical research has explored the relation between business entry regulation and social and economic outcomes. Using data collected from business registries in 100 countries over a period of 8 years (2000-2007), Klapper *et al.* (2009) have shown that the existence of simple procedures to start up a business is critical for fostering formal entrepreneurship. Additionally, cumbersome regulations and administrative procedures for starting a business are also found to be associated with a smaller number of legally registered firms, greater informality, a smaller tax base and more opportunities for corruption (Audretsch *et al.*, 2006). These latter findings are particularly relevant for those European countries characterized by a larger informal sector. They suggest that a quick, efficient, and cost-effective business registration process is critical for fostering formal sector entrepreneurship. Klapper *et al.*, (2009) have also found that barriers to start a business and entry costs are significantly and negatively correlated with business density, calculated as the total number of business registered as a percentage of the economically active population (ages 15-64). According to the authors, for every 10 percentage point decrease in

entry costs, density increased by 1 percentage point.

Empirically, the literature has also disclosed a number of stylised facts regarding the different types of entry into the industry, the correlation between birth and death rates, their variability and the variance of the firm growth rate (Cincera and Galgau, 2005). Bartelsman *et al.* (2003) offers instead a number of comparisons between European countries and the US. Mata (1993) distinguishes between *de novo* entry, the opening of new establishments by incumbents, the opening of new establishments by firms established in related industries that may be seeking economies of scope by expanding their activities and the opening of new establishments by firms from related industries engaged in pure diversification.⁽⁴⁾

Not surprisingly, studies analysing the impact of product market reforms on economic performance through the process of entry and exit generally focus on the link with productivity and typically find a positive link. Overall, the empirical evidence confirms that product market reforms that ease entry, reduce trade barriers, remove price controls and reduce public involvement in production, positively affect productivity and employment and negatively affect the average level of economic rents in the economy (Nicodeme and Sauner-Leroy, 2004).

The theoretical reasons behind the aforementioned expectations on the relevance of firm entry and exit for productivity can be better grasped considering that their direct impacts on it can be decomposed in several effects. The first effect is due to a process of internal restructuring ("within effect"): firms' productivity in the industry increases because of factors internal to individual firms, such as organisational change, new technologies, or reallocation of inputs. The second effect regards, instead, the so-called external restructuring, which represents a reallocation of resources among firms via a process of creative destruction with exit of least efficient firms or via a shift in market shares towards most efficient

⁽⁴⁾ A review of this field of the literature goes beyond the scope of this study, but most of these stylised facts are presented in several comprehensive surveys (see Geroski, 1995 and Caves, 1998).

firms. Related to these ideas are creative destruction models of economic growth (Aghion and Howitt, 1992), according to which new firms play a crucial role in developing innovations. Innovators replace old firms and earn monopoly profits until a new innovation comes along. Barnes, Haskell and Maliranta (2001) found substantial within effects for the OECD; Baily, Hulten and Campbell (1992) found similar results for the US manufacturing firms between 1972 and 1988; and so do Griliches and Regev (1995) for the Israeli industry over 1979-1988. There are also studies that decompose aggregate productivity growth into the contributions of entrants, exitors and incumbents, and show that the process of firm entry and exit plays a role in reallocating resources from low to higher productivity units (Scarpetta *et al.*, 1992; Foster *et al.*, 1998, Baldwin and Gu, 2003). At the same time, firm entry rates tend to be higher in industries with higher output and employment growth (Brandt, 2004), a result that might be related to the aforementioned positive impact of firm entry on productivity.

Among the several factors affecting firms' decision to entry (*see* Cincera and Galgua, 2005), product market regulations stand out as having a considerable influence on it. Scarpetta *et al.* (2002) found that the overall product market regulation level and, in particular, administrative barriers to start-ups have a negative significant impact on firm entry. ⁽⁵⁾

⁽⁵⁾ Likewise, Brandt (2004) found that overly stringent regulation can impinge firm entry. For instance, overly complicated license and permit system or badly designed tax systems discourage the creation of new enterprises.

III. THE DATABASE AND THE ECONOMETRIC APPROACH

Cross-country comparisons in the field of economic regulation, administrative burdens on business, as well as on the time and costs necessary to set up a new company, are difficult to establish because of the relative scarcity of data on these topics. Despite these difficulties, in this study, we constructed a sectoral database covering 12 industries (mining and quarrying, manufacturing, electricity, gas and water supply, construction, wholesale and retail trade, hotels and restaurants, transport, storage and communication, real estate, renting and business activities, education and health and social work and finally other community, social and personal services activities) across 17 European countries (AT, BE, CZ, DE, DK, EE, ES, FI, FR, HU, IT, NL, PL, PT, SE, SK and UK) over the period 2004-2011. To obtain it, we converted NACE Rev. 2 data to NACE Rev 1.1 with the aid of Eurostat conversion tables, and matched data coming from the following sources: Eurostat for firm demographic variables (the total number of firms active in the s^{th} industry at the end of period t , and the number of new firms that entered the s^{th} industry between t and $t+1$); the World Bank Doing Business project for data on the ease to start a business (the cost of starting a business expressed as % of income per capita; the number of procedures needed to start a business; and the time needed to export, expressed in days), and *Intrum Justitia* for data on Government to business (G2B) transactions. The current study differentiates itself from the previous aforementioned EC work (2005) because of the country coverage and the time span: the latter covered 9 EU countries (France, Germany, Ireland, Italy, Portugal, Spain and the UK) over the 1997-2003. In addition, as some Member States have recently introduced changes in the regulatory framework aiming at reducing “red tape” entry barriers, the scope and focus of this study is on the effect of the cost of starting a business and exporting on business dynamics, whereas the previous in-house study had a more broad scope as it aimed at verifying the extent to which product market reforms affected entry rates.

III.1. ENTRY COSTS ACROSS MSS

The Doing Business dataset presents quantitative indicators on the regulations that apply to firms at different stages of their life (regulations for

starting a business, dealing with construction permits, getting electricity, registering property, getting credit, protecting investors, paying taxes, trading across borders, enforcing contracts and resolving insolvency). This homogeneous data source has the main advantage of allowing cross-country comparison in a field where available (and comparable across time and countries) data is very limited.

Notwithstanding the richness of the database, it is worth stressing that the use and interpretation of these indexes is subject to a number of caveats. First of all, the indexes measured (and reported) should not be considered as comprehensive measures of the business environment, but more a measure of the level of business regulations in a MS. Besides, these indicators are not directly linked to reforms in the area, but are rather the outcome on the general business environment and of reforms streamlining and simplifying the cost of doing business. The indicators are developed around standardized case scenarios with specific assumptions, which made them good proxy of the cost of doing business of small and medium-size limited liability companies⁽⁶⁾ operating in the largest business city of an economy (while the reality is that business regulation and their enforcement very often differ within a country), and less good proxies of other business forms. Finally, the Doing Business indicators assume that entrepreneurs have knowledge of and comply with applicable regulations, implying that they are limited to the formal sector (which limits the explanatory power of the indicators in countries characterized by a strong informal sector).

If we consider the overall aggregate ranking of countries according to their doing business ease, the first key message emerging is that heterogeneity is high across EU countries. Among them, Denmark and Norway are those characterized by a more “business-friendly” environment (Table III.1), but the range of variation of each component of the overall index is considerably high.

⁽⁶⁾ Limited liability companies limit the financial liability of company owners to their investments, therefore their personal assets are not put at risk. Sole proprietorships do not provide this kind of protection but can usually be set up with fewer procedures and at lower cost.

Table III.1: Costs of doing business across MSs, (2014)

Economy	Starting a business			Exporting across borders	
	Procedures (number)	Time (days)	Cost (% of income per capita)	Documents to export (number)	Time to export (days)
Austria	8	25	4.8	3	9
Belgium	3	4	5.2	4	9
Bulgaria	4	18	1	4	20
Croatia	6	8	9.3	7	18
Cyprus	6	8	12.3	5	7
Czech Republic	9	19.5	8.2	4	17
Denmark	4	5.5	0.2	4	6
Estonia	5	6.5	1.5	3	6
Finland	3	14	1.1	4	9
France	5	6.5	0.9	2	10
Germany	9	14.5	4.7	4	9
Greece	5	14	4.6	4	16
Hungary	4	5	8.6	6	17
Ireland	4	10	0.3	2	8
Italy	6	6	14.2	3	19
Latvia	4	12.5	1.9	5	10
Lithuania	4	6.5	0.9	4	10
Luxembourg	6	18.5	1.9	5	8
Malta	11	39.5	10.8	5	11
Netherlands	4	4	5.2	4	7
Norway	5	7	1.6	4	8
Poland	4	30	14.3	5	17
Portugal	3	2.5	2.4	4	15
Romania	5	8.5	2.4	5	13
Slovak Republic	7	18.5	1.5	7	17
Slovenia	2	6	0	5	16
Spain	10	23	4.7	4	10
Sweden	3	16	0.5	3	9
United Kingdom	6	12	0.3	4	8

Source: WB Doing Business 2014

If we consider the scores (cardinal values) of each of the indicators used to proxy “red tape” entry barriers, we find that the number of procedures needed to start a business varies from a minimum of 2 (in Slovenia), to a maximum of 10 (in Spain). In terms of days needed to start a business, the range of variation is even higher and goes from the 4 days needed in the Netherlands to the 23 days needed in Spain. The cost of starting a business, express as a % of per capita income, varies instead from zero (in Slovenia) to 14.3% in Poland.

Once the administrative and regulatory burdens to trade across borders are considered, we observe that the number of documents needed to start exporting range from 2 in France to 7 in Croatia,

while the days needed to start exporting varies from 6 days in Denmark to 20 in Bulgaria.

Table III.2 compares the levels of the aforementioned indexes reported in the latest release of the Doing Business (2014) with those reported in the Doing Business 2008. As shown by the table, the majority of EU countries have decreased the cost of doing business, the few exception represented by countries which were already characterized by a relatively low cost of doing business. Fewer countries have decreased the number of procedures needed to start a business, and a relatively low number has improved the ease of exporting.

Table III.2: Changes in the costs of doing business across MSs, (Doing Business 2014 compared to Doing Business 2008)

Economy	Starting a business			Exporting across borders	
	Procedures (number)	Time (days)	Cost (% of income per capita)	Documents to export (number)	Time to export (days)
Austria	=/+	=/+	-	=/+	-
Belgium	=/+	=/+	-	=/+	=/+
Bulgaria	-	-	-	=/+	-
Croatia	-	-	-	=/+	-
Cyprus	-	-	-	-	-
Czech Republic	-	=/+	-	=/+	=/+
Denmark	=/+	-	=/+	=/+	=/+
Estonia	=/+	-	-	=/+	=/+
Finland	=/+	=/+	=/+	=/+	=/+
France	=/+	-	-	-	-
Germany	=/+	-	-	=/+	=/+
Greece	-	-	-	=/+	-
Hungary	-	-	-	=/+	=/+
Ireland	=/+	-	=/+	=/+	=/+
Italy	-	-	-	=/+	-
Latvia	-	-	-	=/+	-
Lithuania	-	-	-	=/+	=/+
Luxembourg	=/+	-	-	=/+	=/+
Malta	-	-	-	-	-
Netherlands	-	-	-	=/+	=/+
Norway	=/+	=/+	-	=/+	=/+
Poland	-	-	-	=/+	=/+
Portugal	-	-	-	=/+	-
Romania	=/+	-	-	=/+	=/+
Slovak Republic	-	-	-	=/+	-
Slovenia	-	-	-	=/+	-
Spain	=/+	-	-	=/+	=/+
Sweden	=/+	=/+	-	=/+	=/+
United Kingdom	=/+	-	-	=/+	-

(1) Legend: A decrease in administrative regulation burdens is identified by "-", whereas a stable or increased administrative regulation burden is identified by "=/+".

Source:

III.2. THE ESTIMATED EQUATIONS

The literature on entry dynamics generally recognizes the existence of a certain number of basic determinants of sectoral business dynamics.

These can be grouped in three categories according to whether they are (I) firms', (II) sector or (III) country specific (European Commission, 2005). Given the sectoral approach of this study, in the following we control for sectoral and country specific determinants and fixed effects, focussing on the role of the “red tape” entry barriers on entry dynamics.

Following the literature, among the entry barriers considered ⁽⁷⁾ and included in the specification of the final model, there are the cost of starting and formally operate a business, the number of procedures needed to start and formally operate it and the time needed to export, included to account for the “easiness” to export and compete on international markets (which in times of crisis may be seen as “alternative” – and fundamental - sources of demand). To estimate their effect on entry, we had to run two separate equations:

$$Entry_{s,c,t} = \beta_0 + \beta_1 sbcost_{s,c,t-1} + \beta_2 timeexp_{s,c,t-1} + \beta_3 govdelay_{c,t} + \beta_4 size_{s,c,t} + \beta_5 vagrowth_{s,c,t} + lagentry_{s,c} + w_{c,t} + \varepsilon_t \quad EQ(1)$$

$$Entry_{s,c,t} = \beta_0 + \beta_1 sbproc_{s,c,t-1} + \beta_2 timeexp_{s,c,t-1} + \beta_3 govdelay_{c,t} + \beta_4 size_{s,c,t} + \beta_5 vagrowth_{s,c,t} + lagentry_{s,c} + w_{c,t} + \varepsilon_t \quad EQ(2)$$

where *Entry* is the ratio between the number of new firms that entered the *sth* sector between *t* and *t+1* and the total number of firms (incumbent and entrant) in sector *s*, in country *c*, at time *t* (the so-called birth rate); *sbcost* is the cost of starting and formally operate a business expressed as % of income per capita (*source*: World Bank *Doing Business*); *sbproc* is the number of procedures needed to start and formally operate an industrial or commercial business (*source*: World Bank *Doing Business*); *time exp* is the time needed to export expressed in calendar days (*source*: World

Bank *Doing Business*) ⁽⁸⁾; *govdelay* is a control inserted for Public Authorities' late payments and measures the average Public Authorities' delay in payment expressed in days relative to legal requirements (*source*: Intrum Justitia); *size* is the average sectoral firms' size; *vagrowth* is the growth rate of industry value added used to control for expanding and contracting industries ⁽⁹⁾ and as a proxy for market profitability (Scarpetta et al. 2002); and *lagentry* is a lag for birth rate. The average size was introduced to capture additional sectoral characteristics that may affect entry cost, such as the presence of economies of scale, ⁽¹⁰⁾ capital and R&D intensity, ⁽¹¹⁾ average advertising expenditures (Hause and Du Rietz, 1984; Kessides, 1990a; Kessides, 1990b). Finally, *w_{c,t}* is the country/sector fixed effect and ε_t is the error term.

Table III.3 reports the main descriptive statistics for the variable of interest, and Table III.4 the pairwise correlation among them.

⁽⁷⁾ At an initial stage of the analysis other additional proxy for entry barriers were used (e.g. number of days needed to start a business; paid-in minimum capital; number of procedures needed to export; tax rate), but they turned out to be not significant. Besides, in the majority of cases their introduction in the equation created significant problems of multicollinearity. For both reasons, they were excluded from the final model specification.

⁽⁸⁾ The measure captures the median duration that incorporation lawyers indicate is necessary in practice to complete a procedure with minimum follow-up with government agencies and no extra payment. It is assumed that the minimum time required for each procedure is one day. Although procedures may take place simultaneously, they cannot start on the same day. More importantly, the time spent by the entrepreneur on gathering information is ignored and is assumed that he is aware of all the requirements and their sequence.

⁽⁹⁾ According to the literature, we can find high firm entry rate into industries that are contracting or a low entry rate into expanding industries.

⁽¹⁰⁾ According to Bunch and Smiley (1992), the presence of economies of scale acts as a substitute to the use by firms of entry deterring strategies.

⁽¹¹⁾ See Singh et al., 1998 and Chang and Tang, 2001.

Table III.3: Main descriptive statistics, variables of interest

Variable	Obs	Mean	Std. Dev.	Min	Max
birthrate	1400	0.0906529	0.0465928	0.0001424	0.4632465
lag_birthrate	1046	0.0893703	0.0487706	0.0001424	0.4632465
sbcost	1473	7.782213	7.263422	0	40.4
sbproced	1473	6.632043	2.429798	3	11
tabtimeexp	1116	11.34229	5.105808	5	22
govadjdelay	875	0.5846676	0.2991328	0.1935484	1.473684
growth_va	1297	0.0132882	0.0741992	-0.386115	0.5821025

Source: Author's elaborations

Table III.4: Pair-wise correlation between variables of interest

	Birth rate	Lag birth rate	Sbcost	Sbproced	Govadjdelay	Tabtimeexp	Growth_va
Birth rate	1						
Lag birth rate	0.6967	1					
Sbcost	-0.0741	-0.0755	1				
Sbproced	0.0334	0.0296	0.5831	1			
Govadjdelay	0.1443	0.1924	0.3983	0.2381	1		
Tabtimeexp	0.0568	0.0293	0.5126	0.3499	0.483	1	
Growth_va	-0.0258	-0.0837	0.0522	0.0821	0.0303	0.063	1

Source: Author's elaborations

The choice of estimating two separate fixed effect models instead of only one (including simultaneously *sbcost*, *sbproced* and *time exp*) was due to the significant problems of multicollinearity emerged during the analysis if *sbcost* and *sbproced* were included together. The presence of multicollinearity (suggested by a high *variance inflation factor*, VIF) inflates estimates' standard errors and may erroneously lead to consider as not significant regressors that, in the absence of it, would be significant. In fact, both variables (*sbcost* and *sbproced*) were found not significant if inserted in the same equation, whereas, if inserted separately, they were both significant and entering the equation with the expected sign.

As the Wooldridge test for autocorrelation in panel-data models (Wooldridge, 2002) suggested the presence of autocorrelation,⁽¹²⁾ I have

⁽¹²⁾ The test is very simple. It consists in regressing the pooled (OLS) model in first difference, predict the residuals,

included a lag for birth rate among the regressors. This choice allows to adjust standard errors for the birth rate correlation structure across groups and for their likely downwards bias (Bertrand et al, 2004) due to the fact that we estimate the effect of an aggregate explanatory variable (the regulatory variable) on individual-specific response variables (i.e. sectoral birth rates), as shown by Moulton (1990).⁽¹³⁾ This is the case for the regulatory variables explored in this study as they do not vary at all within sectors.

regressing the residuals on its first lag, and testing the coefficient on those lagged residuals.

⁽¹³⁾ This is the case, because standard errors are likely to be correlated for observations within each group (in this case countries), especially when the explanatory variable is auto-correlated itself over time and/or across different units within one country (Bertrand et al., 2003).

IV. RESULTS

Results for the fixed effect model with lagged birth rates are reported in Table IV.1. They were robust to different specifications and confirm that over the period 2004-2011 in the 17 analysed European member states birth rates significantly reacted to changes in entry costs, in the number of procedures need to start a business and in the easiness to export, proxied by the time needed to start exporting.

Table IV.1: Results, fixed effect model, with lagged birth rate

	Model 1	Model 2
Lagged birth rate	0.239***	0.245***
	-0.0392	-0.0391
sbcost	-0.00157**	
	-0.000627	
tabtimeexp	-0.00295**	-0.00282**
	-0.00123	-0.00126
sbproced		-0.00285*
		-0.00148
govadjdelay	-0.0249***	-0.0224**
	-0.00945	-0.00936
Observations	805	805
R-squared	0.098	0.094
Number of id3	184	184

(1) Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Source:

The empirical evidence suggests that for any additional one percentage point decrease in the cost of starting a business, which is expressed as a % of per capita income, the birth rate increase will be .00157 on average. Concurrently, we expect that, for any one unit decrease in the number of procedures needed, the average increase in birth rates will be .00285. Finally, a decrease of one day in the average time needed to conclude the procedures to export will increase birth rates by between .00282 and .00295. ⁽¹⁴⁾

⁽¹⁴⁾ As a robustness check, self-employment rates (using as numerator self-employer with employees) have been used as dependent variables instead of sectoral birth rates (results are available upon request). In this case neither the cost of starting a business nor the number of procedure and the time to start exporting have a significant impact on self-employment rates (although the elasticity is low: .0004). This result should be interpreted considering that the Doing Business database approximates the cost of starting for a

In this regard, an additional caveat is needed. Given the database used to approximate the “cost” of doing business, i.e. the *Doing Business* of the WB, these results better approximate the impact of procedures, time and cost for a small to medium-size limited liability company to start up and operate formally and export.

Going back to the results obtained for birth rates, although, at first sight, the average elasticities of birth rates to changes in red tape barriers may seem negligible, once used in conjunction with the real changes occurred after 2011 in the cost and number of procedures needed to start a business and in the time needed to export, they are not.

As previously stressed, these average elasticities can be used to predict the potential change in birth rates induced by the decrease in red tape costs occurred between 2011 and 2014, for instance, in Italy, Portugal and Spain as a consequence of their reforms in this area. If we focus on these three countries (see Table IV.2), it is possible to estimate “out of the sample” the impact of these changes on 2014 birth rates for each of them, i.e. to predict their potential impact on 2014 birth rates (see Table IV.3). In this regard, an important caveat to bear in mind is that the *predicted* birth rates in 2014 may not coincide with the *real* birth rates in 2014. This is due to the fact that the elasticities used to estimate them are obtained on the base of an “other things being equal” assumption, i.e. they measure, for instance, the elasticity of birth rates to a reduction in the cost of starting a business if all the other (observed and unobserved) determinants of birth rates are assumed to be constant.

limited liability company. It somehow suggests that the proxies used are not the more appropriate to investigate the behaviour of entities with a different business form.

Table IV.2: Birth barriers (2011-14)

Country	Year	Procedures (number)	Cost (% of income per capita)	Time to export (days)
Italy	2011	6	18.5	19
	2012	6	18.2	19
	2013	6	16.5	19
	2014	6	14.2	19
Portugal	2011	6	6.5	16
	2012	5	2.3	16
	2013	5	2.3	13
	2014	3	2.4	15
Spain	2011	10	15.1	9
	2012	10	4.7	9
	2013	10	4.7	9
	2014	10	4.7	10

Source: WB Doing Business 2014

Table IV.3 reports the results of this out of sample prediction: the first column reports the birth rate in the four countries in 2011; the second column displays the predicted birth rate in 2014 if the observed change in the cost of starting a business is considered; the third column shows the predicted birth rate in 2014 if the observed change in the number of procedures needed to start a business is considered; the fourth column reports the predicted birth rate in 2014 if the observed change in the number of days needed to start exporting is considered; the fifth column displays the predicted birth rate in 2014 if both the observed change in the cost of starting a business and in the number of days needed to start exporting is considered; and, finally, the sixth columns shows the predicted birth rate in 2014 if both the observed change in number of procedures needed to start a business and in the number of days needed to start exporting is considered.

In this regard, it is worth mentioning that it is not possible to calculate the combined effect of a change in the cost of starting a business, in the number of procedures needed to start a business and in the number of days needed to start exporting because the elasticities of birth rates to the cost and number of procedures needed to start a business are obtained from two different equations, due to the multicollinearity emerged during the econometric estimation. However, it is possible to calculate, separately, (i) the effect on birth rates of a change in the cost of starting a business *and* in the time needed to export and (ii) the combined effect of a change in the number of procedures needed to start a business *and* in the time needed to export. For the sake of simplicity, in the following we comment the separate effects

of the three reform areas (Table IV.3; columns 2nd – 4th).

Therefore, *other things being equal*, the decrease in the cost to start a new firm over the period 2010-2014 observed in Italy, where the cost of starting a business decreased from 18.5% of per capita income to 14.2%, is predicted to increase birth rates from 6.7% to 7.2%.⁽¹⁵⁾ In Portugal the predicted increase of the birth rate would be from 12.4% to 12.9%, while in Spain would be even more robust, due to the sharp decrease in the cost of starting a business⁽¹⁶⁾ (from 7.9% to 9.2%).

⁽¹⁵⁾ Part of the reduction in the cost of starting a business is likely due to the effort towards simplification occurred in Italy in recent years ("Semplifica Italia" is one of the examples).

⁽¹⁶⁾ The observed decrease in the cost of starting a business is likely the result of the reform effort of the Spanish Government in recent years. This effort is still on going as the entry into force of the Entrepreneurship law (14/2013) shows. The Entrepreneurship law has reduced barriers for start-ups and created a limited liability company "in formation" (with lower capital requirements).

Table IV.3: The impact of recent reforms of the easiness of doing business on birth rates

Country	Birth rate in 2011 (%)	Potential birth rate in 2014 (%), COST changes	Potential birth rate in 2014 (%), number of procedures change	Potential birth rate in 2014 (%), time to export change	Potential birth rate in 2014 (%), cost to start a business & time to export change	Potential birth rate in 2014, if number of procedures to start a business and time to export change
Italy	6.7	7.2	-	-	7.2	-
Portugal	12.4	12.9	13.2	12.6	13.1	13.6
Spain	7.9	9.2	-	7.7	8.9	7.7

Source: EC calculations

As far as the changes introduced in the number of procedures needed to start a business are concerned, significant variations are observed only in Portugal. The model predicts that, *other things being equal*, as a consequence of the decrease in the number of procedures needed to start a business, the birth rate might pass from 12.4% to 13.2%.

In the case of changes in the time needed to start exporting, potential changes in the entry rates are observed in Portugal (from 12.4% to 12.6%). Concurrently, in Spain we would observe a slight reduction in the average entry rate (from 7.9 to 7.7%) due to the increase observed in the number of days needed to start exporting.

Overall, once the combined effect of the observed changes in the cost of starting a business or in the number of procedures and exporting is considered (Table IV.3; columns 5th and 6th), the empirical evidence points out that, among these four countries, the most significant impacts on entry dynamics should potentially occur in Portugal.

V. CONCLUSIONS

This study has evaluated the impact of changes in the level of regulations for starting a new business and/or exporting, on sectoral business dynamics in 17 Member countries during the period 2004-2011. Results confirm the theoretical expectation and previous empirical evidence: the higher the level of red tape barriers, the lower entry dynamics.

Additionally, it made an attempt to estimate the potential impact of reforms aiming at increasing the easiness of doing business and export on birth rates that have been recently introduced in Portugal, Spain and Italy. The latter exercise has confirmed that recent reforms should have fostered entry dynamics to a significant extent. In Italy, as consequences of the changes in the cost of starting a business birth rates may increase from 6.7% to 7.2% and in Spain from 7.9% to 9.2%. For instance, in the case of Portugal, if the combined effect of the observed reduction in the cost of starting a business and in the number of days needed to start exporting is considered, the potential birth rates in 2014 could increase to 13.6% (starting from a birth rate of 12.4%).

The general policy conclusion that can be drawn from these results is that birth rates in Europe have positively and robustly reacted to changes in the cost of starting a business and exporting which have been introduced during the period 2004-2011. This key channel of business dynamics has shown to *work*, even in crisis time, suggesting that further steps in this direction will significantly and further increase birth rates leading, *ceteris paribus*, to a more efficient allocation of resources. Furthermore, given the established positive link between business dynamics, on the one side, and allocative efficiency and productivity, on the other side, our results confirm that the former channel is able to transmit the effect of reforms easing entry in domestic and foreign markets on the whole economy. The extent to which this effect is translated into productivity increases will be the object of further sectoral analysis.

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