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Institutions and Firm Formation: an Empirical Analysis of Portuguese Municipalities

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1. Introduction

To ensure their competitiveness in a globalized knowledge-based economy, "places developed a greater need for strategic management in order to capitalize on the growth associated with entrepreneurship" (Audretsch et al., 2004: 317). Accordingly, large relevance can be assigned to an unprecedented identification of those processes through which local institutions and respective governance end up influencing firm births. Such purpose was fulfilled by analyzing the determinants of the varied spatial pattern of start-ups found for the Portuguese territory throughout the previous decade. Estimation of a panel count data model, properly accounting for regional characteristics and specific effects, allowed testing the significance of several indicators on the role played by municipalities in setting the conditions for new business creation.

2. Related Literature

Since the seminal work of Schumpeter (1942), the figure of the entrepreneur has emerged as an important piece in the economic puzzle. For the Austrian, firm formation (or even its prospect) feeds a process of continuous renewal known for posterity as creative destruction. Such theoretical reasoning has been confirmed by several empirical tests on the impact of business creation on regional growth. In fact, a comprehensive survey undertaken by Fritsch (2008) illustrates how supply-side effects resulting from firm entry tend to drive welfare through the path of enhanced competition. Contradicting Birch (1981), the direct contributions for net job creation seem negligible given the crowding-out of both incumbents and entrants that results from selection in a well-functioning system. Nonetheless, associated efficiency gains and innovation-based expansion of markets produce a positive lagged effect on employment which generally prevails. While analysis at the firm level supports the documented dynamics (Mata et al., 1995), overall effects seem conditional, not only on the quality of start-ups and on the financial constraints faced by entrepreneurs, but also on the characteristics of the region chosen for location (Acs and Mueller, 2008).

Sharp differences arise when analyzing the yearly spatial variation of new entrepreneurial ventures within the same country. In order to explain this pattern, understanding which factors underlie local attractiveness appears essential.

By reaffirming the importance of economic geography, Krugman (1991) provided a major contribution on such direction. In his view, location decisions derive from an endogenous process where a circularity of demand-pull effects sustains the concentration of industrial activity. In accordance, decreasing transportation costs and prospective realization of scale economies constitute basic elements behind the urbanization phenomenon. Additionally, the reduced distances that characterize these agglomerations set the stage for frequent knowledge-spillovers. Without neglecting eventual reasons for local specialization, Glaeser et al. (1992) suggest that the magnetism exerted by cities also lies on the frequency of such cross-industry interactions. Hence, firm entry is driven by the benefits accruing from diversity.

Moreover, the regional presence of a vaster pool of qualified workforce, either in terms of job skills or educational background, is determinant in the business creation process. According to Audretsch and

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Feldman (1996), proximity to knowledge sources, namely private and public R&D-based organizations, increases the likelihood of nascent entrepreneurial activity, namely in the area of innovation.

Two final factors must also be accounted for when studying local differences in entry. On one hand, individual decisions of moving to self-employment are much conditioned by wage and unemployment levels (Storey, 1991). On the other, constraints to firm formation posed by liquidity requirements and limited access to capital (Evans and Jovanovic, 1989) cannot be overlooked: wealth, and therefore its regional distribution has an important influence.

For two decades now, empirical research on the geographical variation of firm formation (e.g., Reynolds et al., 1994; Armington and Acs, 2002; Fritsch and Falck, 2007) has examined the suitability of the theoretical predictions aforementioned in numerous spatial and temporal contexts. Transversal to most studies is the high significance verified for demand and agglomeration variables in predicting the local volume of start-ups. While Reynolds et al. (1994) also came across non negligible wealth effects, Armington and Acs (2002) confirmed the positive impact of workforce qualifications and Fritsch and Falck (2007) found short-term unemployment and unitary labour costs to posses explanatory relevance as well. Prior investigation using Portuguese data broadly corroborates such outcomes: Holl (2004) proved that diverse rather than specialized local economies are more conducive to new business creation, whereas Baptista and Mendonça (2010) observed the birth of knowledge-based enterprises to be potentiated by their proximity to universities.

Overall, results indicate that, independently of the developed country under analysis, variation across regions is inherent to the generic firm formation process. Accordingly, both policy design and institutional setup at the level of localities should be more effective in fomenting entrepreneurship than the majority of standardized national strategies.

This thesis originally contributes by deepening the ex-post analysis on the impact of local governance over the amount of firms created. Given the focus on the Portuguese case, the spatial and administrative unit considered is the municipality (município). Each of the 278 municipalities in continental Portugal is effectively empowered in what regards several domains of public choice (e.g., infrastructural development, land-use planning, business licensing). As a matter of fact, in a country with almost no intermediate tiers of regional authority, municipalities fulfil an important institutional role that can be framed in five key vectors of action. Local attractiveness on the perspective of the entrepreneur is therefore impacted through the following means:

1. *Infrastructural planning.* Audretsch et al. (2004) highlight the development of industrial parks, business areas and science and technology incubators as the best representation of a successful start-up oriented policy. By providing the necessary infrastructures, as well as eventual linkages to academic and other R&D-based organizations, municipalities tend to draw closer potential entrants who seek the benefits of knowledge spillovers, synergetic scaling and cost sharing.

2. *European structural funding.* In line with the previous argument, municipalities growingly rely on EU mechanisms to finance several types of projects in the fields of human capital development, innovation and entrepreneurship, among which the creation of enterprise location areas is naturally included. Besides, being most of the territory eligible under the same core cohesion targets, application efforts to Community funds, especially in a scenario of competitive bidding, reveals a higher commitment of municipal entities towards enhancing the local business environment.

3. *Licensing and regulatory framework.* Prospective entrepreneurs may be deterred from market entry due to burdensome bureaucratic requirements. According to Wagner and Sternberg (2004), higher regulatory barriers and, especially, the prevalence of slow paced licensing can discourage any attempts of business creation at start. By holding a partial control over those procedures, municipalities have the ability to influence the likelihood of firm formation.

4. *Financial performance.* Broadening the scope of the previous topic, the well-functioning of municipal institutions must be regarded as a relevant determinant. In fact, the absence of sound financial management, possibly reflected on an exceedingly high current expenditure, may lead to a rise of local

taxation to cope with the accumulated debt service. Accordingly, the low institutional quality proxied by such misallocation of resources is bound to divert new enterprise ventures.

5. *Political preferences*. Finally, given that ruling coalitions tend to be majoritarian, the way in which political forces are customarily represented in municipal governing bodies can be symptomatic of the population attitudes towards business creation and self-employment. In the view of Reynolds et al. (1994), established right-wing conservatism tends to be associated with a stronger entrepreneurial tradition.

3. Model

From the end of the last section it became clear that the probability of observing a firm birth in municipality *i* during period *t*, henceforth termed *pr(n$_{it}$)*, must be regarded as a function of local attributes. Given its count nature, the dependent variable N_{it}, i.e. the annual number of start-ups (nonnegative integers) verified for each municipality, is assumed to follow a Poisson distribution with parameter $\lambda_{it} = exp(X'_{it}\beta)$ accounting for the respective set of municipal determinants.

Such stochastic process relies on the strict hypothesis of constancy in the variance to mean ratio, something which finds no empirical support in the analyzed data. Conversely, this relation tends to rise with the number of firms created, thus evidencing the presence of overdispersion. To handle it appropriately, a negative binomial specification was adopted. Non independence of the counts, given the serial correlation stemming from it, constitutes another assumption violation that had to be tackled. In face of unobserved time-invariant heterogeneity, residuals consistently point the direction in which a specific municipality deviates from the average one. Such phenomenon can be properly dealt through fixed-effects estimation. By controlling for local characteristics which are constant across time (e.g., proximity to the coast) this panel method eliminates a source of bias that would otherwise come from the undetected correlation with the regressors.

By exploring within variation and accommodating overdispersion simultaneously, the adopted fixed-effects negative binomial model delivers consistent estimates on the influence that the set of factors specified below displays over local business formation:

(1)

$$N_{it} = \mu_i + \beta_0 + \sum_{m=1}^{M} \beta_m MUN_{i,t-1} + \sum_{n=1}^{N} \beta_n ENV_{i,t-1} + \sum_{p=1}^{17} \beta_p DIST_i + \sum_{q=1}^{6} \beta_q YEAR_t + \varepsilon_{it}$$

While N_{it} embodies the number of firms created per observational unit and μ_i represents municipal specific effects, regressor sets *MUN$_{i,t-1}$* and *ENV$_{i,t-1}$* stand, respectively, for the role of municipal institutions and for other local environment characteristics. Notice that temporal indexation is lagged by 1 year to avoid eventual reversed causality. In addition, two dummy groups where considered for this specification: on one hand, *DIST$_i$*, encompassing binary variables that account for all Portuguese districts (*distritos*), controls for spatial autocorrelation by absorbing spillover effects which are transversal to neighbouring municipalities (Baptista and Mendonça, 2010); on the other side, *YEAR$_t$* dummies expunge time-specific influences associated to the economic cycle. Lastly, ε_{it} corresponds, as usual, to the random term (estimations relied on the use of cluster-robust standard errors to correct for remaining autocorrelation).

4. Data

The majority of information used in this paper was taken from *Quadros de Pessoal*, a longitudinal matched employer-employee dataset annually updated by the Portuguese Ministry of Solidarity and Social Security (MSSS) on the basis of a survey that firms with positive payroll are legally required to submit (cases of self or wholly familiar employment are thereby exempted). Covering with micro-level detail all private sector business units having at least one wage earner, this database constitutes an exceptionally comprehensive source for research on firm dynamics, among other topics. In practical terms, three interconnected files link

workers to the respective establishments and companies, with only the latter set being considered when calculating the volume of business formation per municipality. Thus, the adopted notion of births (i.e., firm identifiers appearing from one year to another in *Quadros de Pessoal*) refers exclusively to new primary locations/headquarters, something which suits better any analysis on the influence of municipal institutions over entrepreneurship. For similar reasons, start-ups falling outside the partnership or sole proprietorship legal definitions were excluded given their non-profit character.

According to the applied criteria, throughout the 2003-09 period roughly 34.460 start-ups were annually registered in the entire continental territory, most of them (95%) employing less than 10 workers upon creation. For the 1.946 observations pertaining to such interval, this amounts to say that the average municipality experienced 122 new entrepreneurial ventures yearly. However, the level of firm formation behaved in a volatile manner across time (Figure 1.): while a slight increase is observed from 2003 to 2005, a distinct drop took place both in 2006 and 2009, being the latter indissociable from a major economic downturn. Confirming such scenario, the first three years' average is roughly 26% higher than the one for the remaining time span.

Accounting for differences in the industrial structure, the weight of manufacturing in the start-up process has been declining throughout time, now standing below 10%. In sharp contrast, services increased their dominant position during the previous decade such that, by the last year sampled, more than seven out of ten newly created businesses would belong to this sectoral group. Further disaggregation provided in Table 1. shows that, although most firms are still set in the industries of commerce and local market supply (which jointly amount to 56% of all new ventures), business services have been gradually acquiring importance. Highlighted by Armington and Acs (2002) for its knowledge-intensiveness and impact on local growth, the sector's expansion is clearly patent in a mean birth rate of 15%, by far the largest.

Even more than temporal or sectoral differences, spatial variation constitutes a marked feature of the analyzed data. Unsurprisingly, the geographical pattern of entrepreneurial intensiveness is clearly biased towards the coastal side of the country (Figure 2.). In fact, the number of firms created per 1000 inhabitants is particularly high in municipalities located in the northwest (above Porto and surrounding Braga), the littoral centre (close to Leiria) and the extreme south (around Faro). Reversely, the interior, namely the central and north-eastern regions, perform poorly in such respect.

5. Explanatory Variables

The modelization previously presented associates the volume of business formation to regional related factors. Hereupon, the purpose of this thesis is twofold: to analyze the extent in which municipalities stimulate entrepreneurship, as well as to evaluate how controls for local environment deemed significant in earlier studies fit the observed sample. Although endogeneity may be a feature of some variables, something inevitable given the insertion of entrepreneurial patterns in a cumulative growth mechanism (Armington and Acs, 2002), causal interpretations may still be derived by examining firm birth variations within municipalities while lagging the chosen regressors.

Recalling Section 2., the part played by municipal institutions in the start-up process could be sorted in five vectors of influence. Among them, infrastructural planning, especially in what concerns the creation of business location parks, appears to stand out. Oftentimes, implementation of such projects is accompanied by an increase on the amount of hectares per km^2 formally designated as *industrial area* in the municipal spatial chart, a fact justifying the adoption of this indicator as a suitable proxy. Since most firms in services are established on residential space, differences regarding the strength of that determinant are expected upon comparison with manufacturing.

Additionally, per capita access to *European Union funds*, which encompass all capital flows under the cohesion (*CF*), social (*ESF*) and regional development (*ERDF*) mechanisms, signals the efforts and institutional adaptations in which municipalities must engage to improve local attractiveness in the view of entrepreneurs. This rationale applies as well to the burden dictated by the scale of licensing requirements, proxied as the average *unplanned length of construction* works (i.e., in excess of initially predicted dura-

tion). Given the controls imposed on household financial constraints and economic cycle, a major source of delays probably resides on bureaucracy-based interruptions.

Two further measurements are also of particular importance. On the one hand, proper allocation of financial resources at the local level should illustrate the managerial quality displayed by respective authorities, being such attributes quantified as the yearly ratio of municipal *expenditure on employees* (in the sense of own personnel/staff) per inhabitant. On the other side, accounting for the weight of *leftist mandates*, i.e. proportion of members of the municipality's government ideologically distant from right-wing traditional parties (either for current affiliation or past record), enables one to test how differences on both political inclination and agenda may condition the proneness for start-up venturing in the area.

Beyond the institutional variables under analysis, other features of the local milieu (introduced in Section 2. and detailed below) were controlled for to prevent any omission-related bias from affecting the results. Demand expansion, to start with, is here gauged as the annual rate of *young population growth*. By solely considering inhabitants with less than 15 years of age, this measure circumvents endogeneity. As a complement, local market size was scaled using the logarithmized volume of sales per capita (Baptista and Mendonça, 2010).

Previously, it was also argued that urban contexts may enhance entrepreneurial activity by pooling a varied labour supply and facilitating technological spillovers. While the former advantage should be captured by *population density*, calculated as the amount of residents per km^2, the latter benefits ought to be reflected in the local sum of *incumbent firms*. In close connection, the extent to which a heterogeneous setting promotes cross-industry interactions was analyzed through *sector diversity*, a transformed Herfindahl index of employment share dispersion. Moreover, given that reduced cost-distance patterns are inherent to the agglomerative phenomenon, one expects municipalities enjoying *highway access* to attract a greater number of start-ups.

In terms of regional qualification, the existing stock of human capital is consistently found to set the stage for entrepreneurship. Accordingly, workforce skills are assumed to be patent in the shares of *graduates* (i.e. university degree holders) or *researchers and technicians*, a classification comprising knowledge intensive occupations.

Lastly, several forms of opportunity cost may impact the likeliness of firm creation. A higher level of *wages*, for instance, not only amounts to increased input prices as it deters eventual moves towards self-employment. The reverse would apply to a larger municipal *unemployment rate* if it was not for the economic decline also signalled by this measurement. Beyond labour market variables, financial constraints are accounted for as well. Herein, the mean *value of real estate* traded locally proxies the amount of capital available to the average household.

6. Results

Following the prior discussion, major hypothesis underlying local variations in the firm formation process were tested through a fixed-effects negative binomial model. Table 3. provides a summary of results regarding the all-sectors baseline specification (I) described in Eq. (1), as well as a separation between manufacturing (II) and services (III) aimed at controlling for aggregation issues (Armington and Acs, 2002).

In what concerns the role of municipalities as entrepreneurship promoters, significance levels associated to the planning variable confirm the predictions of Audretsch et al. (2004). Evidence shows that an increase of industrial area by one hectare per km^2 leads to a 12% rise in the firm birth probability, thus corroborating (under the assumptions argued in Sections 2. and 5.) the importance of business location infrastructures. Furthermore, stronger effects are expected for manufacturing due to the sector's requirements on scale, set-up costs and synergetic proximity.

A strikingly high relevance is also displayed by the assumed indicator of institutional quality. In fact, spatial units where financial resources are better managed seem to attract a higher volume of new ventures, being such phenomenon transversal to all sectoral groups. Accordingly, the direction of signs patented, not

only reflects the pushing influence of ineffective local governance, as it may capture the prevalence of interiority municipalities who still weigh as non-negligible sources of employment.

Regarding the regulatory framework, unplanned length of construction solely illustrates a situation of deterred market entry in the manufacturing case. Irrelevance of this licensing proxy for the services model reveals that only larger projects, usually asked to comply with a stringent set of norms, are discouraged upon implementation by slow-paced bureaucratic proceedings under the partial control of municipal institutions.

As for the political landscape, estimation outcomes are in line with Wagner and Sternberg's (2004): ideology, taken as the proportion of mandates assigned to left-wing forces, has no part in the firm formation process. Consequently, neither the neutrality of business supporting policies is contested, nor voting is viewed as mirroring a traditional aversion towards entrepreneurial activity. Surprisingly alike, per capita distribution of European funds appears to exert no impact over local start-up intensity. Given the sums considered, the similitude in regional eligibility and the within-country nature of this analysis, one cannot expect sheer misapplication to explain those results on its own. Such reasoning suggests that differences across programming intervals and expenditure objectives must be properly handled.

When exploring local environment traits which are beyond the institutional influence of municipalities, demand behaviour and agglomeration dynamics protrude as the most important processes affecting overall firm formation (in line with Reynolds et al., 1994). By inspecting once again Table 3., it is visible how a percentage point rise on young population growth or a density increase of one thousand inhabitants per km^2 enlarges the proneness for new business ventures in 3% and 6% respectively, being those effects non-rejectable at any typical level. Interestingly, measures like disposable income or volume of incumbent firms seem to have no relevance in the model, an occurrence perhaps explained by their strong correlation with the above cited regressors.

Notable discrepancies emerge if taking services and manufacturing separately. Being the former sectoral group still dominated by births on the fields of commerce and local market supply, it comes as no wonder to observe such greater incidence of demand-based variables. Inversely, manufacturers appear more susceptible to rely on a dispersed network of clients and, thereafter, to face heavier transport costs. In a country where around 85% of freight movement is done by road (Holl, 2004), that alone could justify the attraction stemming from highway proximity. Contrasts are extensive to the used diversity index. As a matter of fact, the lack of significance verified for manufacturing is possibly echoing the existence of some industries which benefit from localized specialization, scenario finding no replication in column (III).

In terms of human capital, the municipal share of graduates impacts the propensity for business creation, meaning that a higher level of skills encourages entrepreneurial activity. Upon disaggregation, this merely holds true for services. Examining knowledge intensive sectors, Baptista and Mendonça (2010) put forward an appealing explanation ahead of obvious disparities in entry costs: while manufacturing-related qualifications are still scant and generally absorbed by incumbents, the competitive setting in services is altogether in a superior stage, thus fostering start-up ventures.

Unexpectedly, the wage predictor yielded a negative sign for specifications (I) and (II). Such outcome may be reflecting either a failure of the considered qualification measurements in fully controlling for workforce attributes, or the unsuitability of exploring cross-regional rather than cross-industry input price variations (Fritsch and Falk, 2007). These interpretative caveats do not apply to unemployment. Its dampening influence over firm formation, as exposed in columns (I) and (III), illustrates how broad market-shrinkage effects prevail over necessity driven entrepreneurship. Lastly, after accounting for a plethora of variables, no significance was assigned to personal wealth.

7. Conclusions and Policy Implications

By promoting innovation and enhancing the competitive stage, a high level of firm creation can be seen as a prerequisite for economic development. Consequently, it is in the interest of municipal policy makers to encourage entrepreneurship. Portuguese data on the uneven spatial distribution of entrants, drawn from

Quadros de Pessoal for the 2003-09 period, constitute evidence on how regional characteristics influence location decisions, therefore attesting such view. While some features, as demand or agglomeration dynamics, result from circular pull effects hardly replicable by local governments alone, there are areas where the action of municipal institutions overcomes any standardized national measures in successfully fostering business formation.

The thesis original contribution lies in identifying those means through which municipalities influenced the start-up volume. Following the estimation of a fixed effects negative binomial model that controlled for several local environment attributes, two outcomes clearly stood out: Both the sound management of municipal financial resources, here taken as a sign of overall institutional quality, and the increase in the amount of land officially allocated for industrial usage, assumed as a proxy for the establishment of business location areas, were found to exert a positive and highly significant impact. This also proved to be the case for a less cumbersome licensing framework, if confining the sample solely to manufacturing. Conversely, the ideological stance of the party/coalition leading local governance seems to be irrelevant.

In the future, one expects the growing detail of local statistics to unlock various research possibilities: on one hand, the computation of new regressors (e.g., municipal indebtedness or taxation) will allow to scan the behaviour of residuals; on the other, quasi-experiments resorting to a differences-in-differences approach may improve the understanding of the causal effects stemming from specific policy implementation. Finally, it would be of importance examining how the entrepreneurial attractiveness of municipalities varies according to size, industry and technological character of start-ups.

8. References

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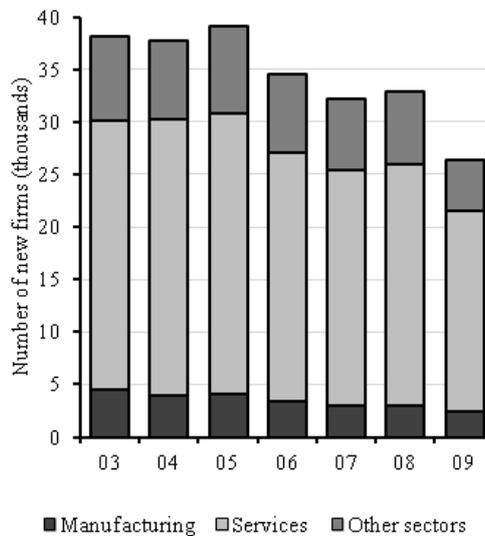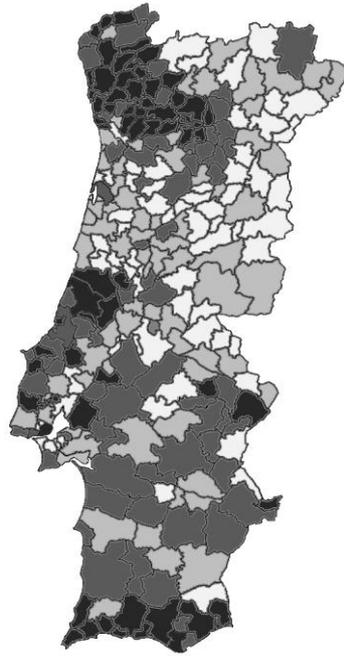**Appendix**

Figure 1. Firm births across time

Figure 2. Firm birth rates across municipalities

Start-ups per 1000 in habitants
(2003-09 average)

	≥ 1,49 Λ < 2,61 (70 municipalities)
	≥ 2,61 Λ < 3,15 (69 municipalities)
	≥ 3,15 Λ < 3,80 (69 municipalities)
	≥ 3,80 Λ < 7,50 (70 municipalities)

Table 1. Firm births across sectors (yearly averages)

	Number	Share (%)	Birth rate
All sectors	34.463,43	100,00 %	12,57 %
Extractive	1.804,00	5,23 %	13,18 %
Infrastructures	5.301,57	15,38 %	12,83 %
Manufacturing	3531,14	10,25 %	8,85 %
Business services	4701,57	13,64 %	15,85 %
Commerce	11085,86	32,17 %	12,60 %
Local market	8.039,29	23,33 %	13,03 %

Notes

Birth rates correspond to the no. of entries per 100 existing firms.

Table 2. Summary statistics (partial): indicators of the role of municipalities

Variables	Mean	Std. dev.	Min - Max	Correl.	Hypothesis
Industrial area (ha. per square km)	1,40	2,27	0,00 - 15,04	0,34	+
European Union funds (k € per capita)	0,09	0,11	0,00 - 1,08	- 0,17	+
Unplanned length of construction (%)	26,86	12,58	1,60 - 111,22	0,08	-
Expend. in employees (k € per capita)	0,28	0,18	0,05 - 1,67	- 0,26	-
Leftist mandates (%)	55,68	24,32	0,00 - 100,00	- 0,07	-

Notes

Correl. column reports the correlation with the number of firm births in all sectors.

Symbol k stands for thousands; *ha.* stands for hectares.

Table 3. Regression results for firm creation: all sectors, manufacturing and services

	Births (no.) - fixed effects negative binomial model					
	All sectors		Manufacturing		Services	
	I		II		III	
Planning (municipalities)						
Industrial area (ha. per square km)	0,1170**	(2,01)	0,1635**	(2,45)	0,0289*	(1,75)
Funding (municipalities)						
European Union funds (k € per capita)	0,0198	(0,22)	- 0,0106	(0,07)	0,1166	(1,09)
Licensing (municipalities)						
Unplanned length of construction (%)	- 0,0003	(0,16)	- 0,0041**	(2,55)	- 0,0003	(0,07)
Financial performance (municipalities)						
Expend. on employees (k € per capita)	- 0,4319***	(3,97)	- 0,6385***	(4,19)	- 0,4577***	(4,92)
Political preferences (municipalities)						
Leftist mandates (%)	0,0012	(1,39)	- 0,0014	(1,22)	0,0006	(0,81)
Demand						
Young population growth (%)	0,0251***	(3,97)	0,0070*	(1,81)	0,0296***	(2,78)
Sales (per capita and logarithmized)	0,0711	(1,20)	- 0,0783	(1,37)	0,0107	(0,45)
Agglomeration						
Population density (k per square km)	0,0623***	(2,72)	0,1205**	(2,38)	0,1129**	(2,13)
Incumbent firms (k)	0,0202	(0,47)	0,5342	(0,97)	- 0,0489	(1,35)
Sector diversity (inverse herfindahl index)	0,0120	(0,91)	0,0101	(0,78)	0,0055*	(1,75)
Highway access (dummy)	0,0928**	(2,45)	0,0334**	(2,13)	0,0314	(1,21)
Qualification						
Graduates (%)	0,0127*	(1,66)	0,0051	(0,46)	0,0105*	(1,93)
Researchers and technicians (%)	0,0111	(1,35)	0,0232	(1,41)	0,0074	(0,87)
Labour market						
Wages (k € per employee)	0,5864**	(2,22)	0,7904**	(2,35)	0,0997	(0,46)
Unemployment (per 100 active aged pop.)	- 0,0242**	(2,50)	0,0060	(0,60)	- 0,0139**	(2,35)
Personal wealth						
Mean value of real estate (k €)	0,0003	(1,39)	0,0002	(0,49)	0,0002	(0,93)
Econometric controls						
Year dummies $\chi2$ (6)	471,92***		267,97***		337,11***	
District dummies $\chi2$ (17)	234,04***		32,01**		41,31***	
Constant	1,1384**	(2,07)	4,0739***	(6,48)	1,4068*	(1,88)
Summary statistics						
Observations	1946		1946		1946	
Wald $\chi2$ (39)	5615,3		2352,9		2916,6	

Notes

All explanatory variables were lagged one period to account for potential endogeneity.

For the exponential conditional mean, coefficients are interpreted as a semi-elasticity.

Standard errors were adjusted for clustering; absolute z-statistics are given in parenthesis.

Significance at 1% denoted by ***; significance at 5% denoted by **; significance at 10% denoted by *.

Symbol k stands for thousands; $ha.$ stands for hectares.