

Regional Determinants of Firm Entry in Argentina: an Analysis for the Period 2003-2008

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Abstract

The aim of this paper is to explore the determinants of firm entry in Argentinian provinces. Panel data (from 2003 to 2008) were used to estimate the determinants of entry, which may be specific to the region or the industry. The empirical application uses data from manufacturing firms which declare employees to Social Security. This article contributes to the literature on firm entry because most of previous contributions have focused on cases as Europe, North America or Japan, while very few empirical contributions do exist regarding developing countries.

Key words: firm entry, regional economics, Argentina

JEL: R12; R30; C33

Resumen

El objetivo de este artículo es explorar los factores regionales que determinan el ingreso de nuevas empresas en las provincias argentinas. A tal fin, se utilizan datos de panel (para el período 2003 a 2008) referidos a las firmas industriales que declaran empleo a la Seguridad Social. Este artículo contribuye a la literatura de localización industrial existente dado que la mayor parte de los trabajos previos se centran en casos tales como Europa, Norteamérica o Japón, siendo las aplicaciones para los países en desarrollo aún escasas.

Palabras clave: entrada de empresas, economía regional, Argentina

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1. Introduction

The process by which new manufacturing firms enter into markets, either grow and survive or exit from the industry has crucial effects on economic growth and welfare. New businesses may have direct and indirect effects on economic performance, both in terms of employment and production, but there are also several qualitative and quantitative issues that have to do with securing efficiency, stimulating productivity increase, reducing prices, creating new markets, stimulating innovation, increasing the variety of products and intensifying labor division. These benefits are not necessarily limited to the industry to which the start-up belongs, or to the region in which the entry occurs. Furthermore, Acs and Amorós (2008) find that entry of new firms is particularly relevant for developing economies, since innovative entrepreneurship leads to gap-filling and input-completing activities.

Thus, the aim of this paper is to identify the determinants of firm entry in Argentinian provinces, over the period 2003-2008. The aim is to approach some of the critical questions in this literature within the framework of a developing economy. Using such empirical application constitutes a clear novelty inside an empirical literature mainly centered in cases as Europe, North America or Japan, while very few empirical contributions do exist regarding developing countries. Besides, including the spatial issue as a central factor is essential in order to analyze a country with important regional differences in terms of wages, labor skills, economic growth rates and other factors that influence territorial competitiveness. These results have important policy implications in terms of the design of entry promoting policies and SMEs support policies in developing countries.

The rest of the paper is organized as follows. Section 2 reviews empirical literature on firm dynamics at a regional level. Section 3 describes the data set and the research methodology. Section 4 presents the main results and, finally, section 5 provides the main conclusions.

2. Literature review: determinants of firm entry at a regional level

Empirical literature on firm dynamics has widely demonstrated that there are huge differences in entry rates across regions. In this sense, there is an important number of contributions that focus on such regional issues like those (among others) of Fotopoulos and Spence (2001) and Keeble and Walker (1994) for the UK; Hart and Gudgin (1994) for Ireland; Guesnier (1994) for France; Davidsson *et al.* (1994) for Sweden; Fritsch and Falck (2007) and Audretsch and Fritsch (1994) for Germany; Armington and Acs (2002), Rigby and Essletzbichler (2000) and Campbell (1996) for the US; Kangasharju (2000) for Finland;

Spilling (1996) for Norway; Santarelli *et al.* (2009), Carree *et al.* (2008) and Garofoli (1994) for Italy; Fotopoulos and Spence (1999) for Greece; Arauzo-Carod *et al.* (2007) for Spain or Tamásy and Le Heron (2008) for New Zealand. Such differences can be explained according to specific regional characteristics that make regions more (less) attractive to new ventures and, in any case, the magnitude of the effects suggests that regional dimension must be included in firm formation analysis¹ (Fritsch and Schmude, 2006). However, there are very few empirical contributions regarding developing countries. And, even though firm dynamic processes present certain regularities (synthesized by Geroski, 1995), they may acquire particular features depending on the level of development of each country.

Recently, Bosma *et al.* (2008) summarised such regional specific determinants into three main categories: i) demand and supply factors, ii) agglomeration effects and iii) cultural or policy environment determinants.

Firstly, demand and supply factors influence both attractiveness of a region and potential growth of firms. Such effects have been measured by using size of local markets (proxied by population or population dynamics), income levels of such markets or wider areas, output levels or its growth rate, human capital, unemployment and unemployment dynamics and industry mix, among others.

Secondly, agglomeration effects are demonstrated to be a key determinant for the entry decisions of new firms since they increase market opportunities as well as efficiency of firms that can benefit from such closeness with other firms. Positive effects of agglomeration have been widely demonstrated by scholars (see, among others, Audretsch and Fritsch, 1994), although there is an academic discussion regarding what benefits the most the entry of new firms: localization economies (i.e., location of firms of similar industries) or urbanization economies (i.e., location of firms of different industries). In any case it is important to take into account that there are also negative effects of agglomeration (diseconomies) that could cause congestion and rise of land prices and wages among other shortcomings.

Thirdly, issues regarding policy measures and cultural attitudes towards entrepreneurship have been widely analysed. Nevertheless, such issues are not easy to be included into empirical analyses. For example, scholars use to proxy those policies by taking into account the amount of public spending (ideally on infrastructures, since it may increase indirectly

¹ Many studies reported in a special issue of the *Regional Studies* journal in 1994, established that about 70% of the regional variation in business start-up rates can be explained -at least in the statistical sense- by differences in economic and socio-demographic characteristics of the regions (Davidsson and Wiklund, 1997)

demand for new firms) if data about specific entry-promoting policies is not available (Sutaria and Hicks, 2004; Reynolds *et al.*, 1994)². Cultural attitudes are even more difficult to be measured and researchers use to rely on several proxies in order to capture such positive attitudes towards new firm creation. Some scholars try to capture them by taking into account social structure in terms of self-employed people assuming that “areas exhibiting social mobility and having a high proportion of individuals in self employment will have higher rates of new firm formation” (Garofoli, 1994, p. 388). There are also other path-opening contributions that assume that cultural diversity enhances firm creation and measure such diversity in terms of the percentage of the population that is foreign born (Tamásy and Le Heron, 2008). However, other studies have concluded that differences regarding entrepreneurial attitude are mainly across nations, not across regions (Davidsson and Wiklund, 1997), so that researching in this field is still opened.

As we have said before, previous empirical evidence is referred mainly to European regions, although there are also contributions about New Zealand or states of the U.S. (see, among others, Tamásy and Le Heron, 2008 or Armington and Acs, 2002). In any case, empirical findings about such issues for developing countries are scarce³. Another shortcoming regarding the state of the art in such countries refers to extant heterogeneity among them, so empirical findings apply only for a narrow number of them. Nevertheless, there are some empirical papers that analyse the Argentinian case, although none of them at the regional level (Castillo *et al.*, 2002; MTEySS, 2007; Gennero *et al.*, 2004; Bartelsman *et al.*, 2004).

About the specificities of developing countries, Bartelsman *et al.* (2004) argue that in these countries policies may give incumbents a preferential treatment, may artificially increase barriers to entry or either make exits for some type of businesses more frequent. However, the effects of these distortions are not clear. Despite these authors hypothesize that countries where the creative destruction process is distorted in some manner will have less churning, the fact is that developing countries generally exhibit higher rates of rotation.

Alternatively, Fritsch *et al.* (2006) argue that some types of distortions in market structure and institutions might make the entry and exit process less rational, which is, less driven by market fundamentals but more by random factors. They conclude this because they find that factors that have a statistically significant effect on survival in East Germany are fewer than

² Eventually, those policy specific issues are proxied in a very different way. In this sense, Garofoli (1994) tries to capture what he calls “Political climate” measured by the percentage of votes obtained by communist and socialist parties.

³ See an especial issue of *Small Business Economics* (number 34 (1)) about entrepreneurship at developing countries for a more detailed analysis of those specific cases (Naudé, 2010).

those ones existing in West Germany. Therefore, they deduce that survival of new businesses in East Germany is subject to erratic influences to a greater extent than is true in the West. However, their findings could mean instead that survival, in these cases, depends on different variables, which have been not included in the model.

Besides, macroeconomic instability and the intense cyclical variations that characterize many developing countries, might induce patterns of entry and exit different from the ones observed in developed countries⁴. In addition, Caballero and Hammour (2000) point out that recurrent crisis are an obstacle to creative destruction, specially because of the following tight financial-market conditions. Another distinctive feature is that young companies usually have a relatively greater economic impact. That is because developed countries rely on a more stable and consolidated structure of firms, so that births, even in dynamic periods, represent a marginal portion of the employment (Davis *et al.*, 1997; Castillo *et al.*, 2002).

Finally, unlike developed countries, Latin American firms mainly innovate through imitation or absorption of knowledge developed by other organizations. For this reason, Burachik (2000) holds that innovative entry is a very infrequent phenomenon in Latin American countries. In the same way, Amorós and Cristi (2008) argue that these countries have a limited number of nascent ventures under the model of “entrepreneurial economy” because of the many restrictions present to create knowledge-based businesses.

However, despite the distinctive features of developing countries, there is little evidence about firm demography processes in them. As for Argentina, some authors conduct mainly exploratory (Bartelsman *et al.*, 2004) or descriptive analysis (MTEySS, 2007) and they do not look for the determinants of the processes of firm demography. Other studies (Castillo *et al.*, 2002) analyze rates of employment creation and destruction and conclude that size, sector and age of the firms explain part of firm performance in terms of job creation and destruction. However, they also show significant behavior heterogeneity that can not be captured from the aggregated level of analysis and may be explained by regional differences. On the other hand, some contributions which do account for regional differences, focus in previous stages of firm creation process (the gestation of new business ideas) and rely on population surveys in which actual and potential entrepreneurs are detected (Gennero *et al.*, 2004).

⁴ A research carried out by MTEySS (2007) shows that the process of birth and shutdown of plants in Argentina is pro-cyclical. These results contrast with those found for Portugal and Germany, where few evidence exists in respect to the effects that macroeconomic conditions have on the patterns of entry, exit and survival (Mata *et al.*, 1995; Boeri and Bellman, 1995).

According to previous considerations, our goal is to explore the determinants of firm entry in Argentinian provinces, according to: i) characteristics of the territories (unemployment, human capital, entrepreneurial attitude, population density, etc.) and ii) industry specific variables.

3. Data and methodology

Data. Data of firm demography (entries, exits and incumbents) is generated by the Employment and Business Dynamics Observatory (EBDO) of the Ministry of Labor and Social Security, from Argentina. The data covers all manufacturing firms with at least one employee and is available for all Argentinian provinces (23) and Capital Federal⁵. This accounts for about 40% of total employment in Argentina (the other 60% belongs to public employment, informal employment and self employed without employees). Though, registered private sector is the one with higher productivity. It represents the most up-to-date, comprehensive, reasonably long-term and spatially disaggregated data source currently available for firm demography studies⁶. Only “local firms” were considered in each province, that is, firms that declare the major part of their personnel in that province. In other words, branch offices or subsidiaries located in other jurisdictions were excluded⁷.

In this study we analyze the whole population of formal firms, divided into 23 two-digit manufacturing industries (summarised at Table A.1 in appendix) for the 2003-2008 period. This period begins in 2003 because 2002 was a very atypical year, with a sharp downturn which followed the economic and political crisis of the ends of 2001 and the devaluation of January 2002. Moreover, 2008 is the last year available.

Dependent variable. As we analyze firm dynamics at a regional level, we must take into account some regional specificities. Given that regions differ in population of firms, using absolute numbers of entries should be misleading (Audretsch and Fritsch, 1994), so entry rates are used. There are some methods to standardize entries according to the size of respective markets, mainly such known as ecological approach (entries standardized by number of incumbent firms), population approach (entries standardized by number of

⁵ Buenos Aires Province is disaggregated into Greater Buenos Aires (GBA) and Rest (Bs. As. Rest), so that we have considered a total of 25 jurisdictions.

⁶ Besides, this database recognizes changes in the firm codes that do not reflect market entries and exits. That is, spurious entries and exits are identified through a procedure called "tracking employment", which consist of identifying the displacement of the whole personnel from firms that "exit" to "new" firms.

⁷ This was suggested by EBDO professional staff. In this way, it prevents new entries of large firms appear when new offices or branches are opened in another province with only one or two people. For this reason, data is also less volatile.

inhabitants) and labor market approach (entries standardized by number of jobs or by active population). Although most of researchers assume that new firms come from the extant population of business and then prefer the ecological approach, there is no agreement among scholars about the most appropriate approach (see, for instance, Garofoli, 1994 in support of labor market approach). In particular, in developing countries, young companies usually have a relatively greater economic impact, since they do not rely on a stable structure of firms, as developed countries do⁸. Thus, births represent a major portion of the employment and of the incumbent firms (Davis *et al.*, 1997; MTEySS, 2007). As a result, entry rates -calculated from the ecological approach- show considerable variation between years as well as between regions. Because of that, in this paper we assume that it is more appropriate to adopt the population perspective, that is, to compute the gross entry rate as the ratio entries/population. This approach assumes that firms are created by the inhabitants of the area in which firms are located and this process is strongly influenced by local market expectations (Garofoli, 1994)⁹.

Thus, following the population perspective, the dependent variable ($GENR_{it}$) -Gross Entry Rate per 10.000 inhabitants- was calculated by dividing the number of establishments created each year at each territorial unit ($Entries_{it}$) by the number of inhabitants for the same period and the same jurisdiction ($Population_{it}$): $(GENR_{it}) = 10.000 * (Entries_{it}) / (Population_{it})$.

Independent Variables. Data about characteristics of Argentinian regions come from Household Permanent Survey, Military Geographical Institute and own calculations from EBDO data (Table 1). As we have previously mentioned, there are many factors that may affect firm birth, both territorial and sectoral. Table 1 displays these factors (explanatory variables), their definition and sources.

We consider that market dynamics is a complex phenomenon that has to do with entries and exits. Therefore, it seems necessary to take also into account the gross exit rate of firms (GExR) when explaining entry decisions, as in Arauzo-Carod *et al.* (2007), for instance. About this particular, there are some arguments about why to consider exit rates, like the replacement theory of firms that says that exits in previous periods may leave room for future entries (Günlalp and Cilasun, 2006; Audretsch, 1995).

⁸ Young companies (less than 10 years) concentrate in Argentina more than doubled employment than young companies in the U.S. do. Similarly, mature companies in Argentina have a share in total employment (56%) substantially smaller than mature U.S. companies (79%) (MTEySS, 2007).

⁹ The labor market perspective, which is based on the assumption that agents decide to set up a new firm in the labor market where they come from and where they have had previous labor experience, could have been considered (Kangasharju, 2000; Keeble and Walker, 1994; Johnson, 1993; Ashcroft *et al.*, 1991). However, data about active population by provinces is not available.

As we expect more business creation in densely populated areas, due to the existence of stronger markets and agglomeration effects, DENSITY variable is included as usual on entry analysis (see Armington and Acs, 2002; Audretsch and Fritsch, 1999; Davidsson *et al.*, 1994, among others). In the same way, to take into account negative effects of too much agglomeration, the square of this variable (DENSITY2) is also incorporated. The idea behind both variables is that agglomeration effects are like an inverted U-shape: more dense areas provide positive incentives and benefits to firms but if density is too high, some congestion problems appear that make them less attractive to economic activity.

Table 1. Explanatory variables: definition and sources

Variable	Definition	Expected sign	Source
GExR	Firm exits/Annual average population	+/-	Own calculations from data in EBDO
DENSITY	Annual average population/Area	+	Military Geographical Institute and HPS
DENSITY2	Density squared	-	
PRIVATE_EMPLOYEE	Private employees/Public employees	+	
LATE_IMMIGRATION	% of the population who have been born outside the province	+	
POVERTY	% of people below the poverty line.	-	
ACTIVITY_RATE	Active population/Total population	+	
UNEMPLOYMENT_RATE	Unemployed/Active population	+/-	Own calculations from Household Permanent Survey (HPS)*
NON_REG	% of non registered workers over total workers	+	
SEC_SCH	% of active population with completed secondary school	+	
NON_ED	% of active population without formal instruction	-	
INDUSTRY_SHARE	Industrial firms/Total firms (formal)	+	
LOW_BARRIERS			
MIDDLE_BARRIERS	% of firms in sectors with low / middle / high barriers. (Sum=1)	+/-	Own calculations from data in EBDO
HIGH_BARRIERS			

*Except for Capital, Rest of Bs. As., GBA, Córdoba, Chubut, Entre Ríos and Santa Fe, data of HPS correspond to the capital city of each province. Data refer to 3rd quarter of every year, except for 2007 (4th quarter).

Source: authors

Issues regarding cultural attitudes towards entrepreneurship may be captured by the ratio private/public employees (PRIVATE_EMPLOYEE). Migration also helps to explain the dynamism of an economy (Tamásy and Le Heron, 2008), so we have taken into account the percentage of the population who are born outside the province (LATE_IMMIGRATION). Several studies have considered its importance as a source of entrepreneurial motivation. According to Waldinger (1986), migrants tend to be more prone to risk than people who remain in the place of origin, and they are usually more motivated and more adaptable to changes than the natives are.

The income level of markets is proxied by the variable *POVERTY*, which represents the percentage of people below the poverty line. Thus, the expected sign is negative, since markets with a low level of income may discourage the entry of new firms. This variable may also proxy access to capital in a broad sense. For instance, Casson's model (1982) considers not only the stock and distribution of entrepreneurial ability among the population, but also the proportion of able entrepreneurs who are "qualified", that is, who have access to resources for backing their business decisions (Hamilton and Harper, 1994). Such control over resources may be gained through personal wealth, good social contacts with wealthy people, or financing from venture capitalists. Thus, we can expect that potential entrepreneurs may have more difficulties referred to capital access in poorer regions. Nevertheless, Naudé (2010) argued that poverty could have the opposite effect, since the "option of entrepreneurship can allow individuals and households to escape from both absolute and relative poverty" (p.7).

To measure the effects of the labor market on firm demography, *ACTIVITY_RATE* and *UNEMPLOYMENT_RATE* can capture dynamism of regional labor markets (see, among others, Santarelli *et al.*, 2009; Armington and Arcs, 2002 and Audretsch and Fritsch, 1999), so they were also included. Empirical studies show a twofold evidence of unemployment over firm entry: i) positive (on the one hand, unemployment push hypothesis showing that unemployed workers are more likely to be self-employed due to their current professional situation and, on the other hand, unemployment may imply a lower cost of labor) and ii) negative (unemployment pull hypothesis suggesting that entrepreneurial capital of unemployed workers is small, so they will not tend to create their own firms and, additionally, that markets are weak in depressed areas with high unemployment levels). In addition, instability, insecurity and dissatisfaction with the present job are also factors that may push individuals to start their own business (Storey, 1994). Thus, the percentage of non registered workers (*NON_REG*) was also taken into account to proxy this effect.

Several scholars have demonstrated that skill level of human capital is a key determinant of firm entry (Nyström, 2007; Fritsch, 1995). Here those characteristics are proxied by *SEC_SCH* and *NON_ED*, that is, the percentage of active population with completed high school and the percentage with no formal education at all, respectively. In this sense, we expect that higher the stock of human capital, higher the firm birth rate. Share of industrial firms over total firms (services, commerce and manufacturing) (*INDUSTRY_SHARE*) may also proxy the existence of necessary infrastructure for a company in the same sector be able to operate, given that geographical distribution of manufacturing activity usually

complies with a certain profile of human settlements and minimum thresholds of coverage of services.

Besides, entry rates may be affected by sectoral variables, specially barriers to entry and exit. In order to control for such effect, it was included -for every province- the proportion of firms that belong to an industry with low, middle and high barriers (LOW_BARRIERS, MIDDLE_BARRIERS and HIGH_BARRIERS)¹⁰.

Model. Data of firm entry over the period 2003-2008 is a panel, since we have data over time for the same cross section units (provinces). Panel data estimation has been used in recent literature on firm demography (Arauzo-Carod and Teruel, 2005; Gaygisiz and Köksal, 2003; Kangasharju, 2000, among others). One of its main advantages is that the bias derived from the non-observable heterogeneity can be controlled, which means that the richness of panel data obviates the need for data on things that may be difficult or impossible to measure. Besides, it provides more degrees of freedom in estimation and, therefore, efficiency increases.

The simplest estimator for panel data is pooled OLS, which assumes that all cross-sectional units have a common intercept, that is:

$$\text{GEnR}_{it} = X_{it}\beta + \alpha + \mu_{it}$$

However, if the intercept term is heterogeneous and if it is correlated with the included regressors, the OLS estimator will be biased and inconsistent. In this case, we have to decompose the unitary pooled error term ($\mu_{it} = \alpha_i + \varepsilon_{it}$) and estimate each unit-specific component (α_i):

$$\text{GEnR}_{it} = X_{it}\beta + \alpha_i + \varepsilon_{it}$$

The key issue is whether or not it is uncorrelated with the observed explanatory variables (Wooldridge, 2002). The fixed-effects estimator allows for correlation between the unobserved effect and the observed explanatory variables. It is always consistent, but at the cost of not being able to estimate the effect of time invariant regressors. On the other hand, the random effects estimator ensures that parameters for time-invariant regressors can be estimated, and that estimation of the parameters for time-varying regressors is carried out more efficiently. However, if individual effects are correlated with some explanatory variables, the random-effects estimator would be inconsistent, while fixed-effects estimates would still

¹⁰ Industries were classified according to MTEySS (2007: pp.64-65).

be valid. So, we can compute the Hausman test in order to prove the consistency of the random effect estimator¹¹.

4. Results

In Argentina, population and firms are highly spatially concentrated around the main cities and, specially, the capital. About 80% of workers and firms¹² are located in 5 of the 25 jurisdictions considered: Gran Buenos Aires and Rest of Buenos Aires Province, Capital Federal, Santa Fe and Córdoba, which represent only 22% of the surface of the country¹³ (see Table A.2 in Appendix). The main industrial sector in terms of number of employees is Manufacture of food products and beverages, followed by Other non-metallic mineral products, Chemicals and chemical products, Motor vehicles, trailers and semi-trailers and Machinery and equipment (Table A.1 in Appendix). Except for the first one, which is the most uniformly distributed industry along the country, most industries are concentrated in certain regions, due to several historical reasons (Carlevari and Carlevari, 2003).

A first insight into firm dynamics during the period 2003-2008 for the whole country (Table 2), shows that firm entries have maintained around 5.000 new start-ups per year while exiting firms have doubled from 2.330 in 2003 to more than 5.000 in 2008. This important increase on exiting firms is the result of typical market dynamics in years with high GDP growth after a deep crisis: in expansive periods entry rates usually increase, specially after a crisis like the one that affected Argentina between 1999 and 2002. When the national market begins to grow again (although slowly), there is a flood of entrants (whose entry was delayed by the crisis) as well as new business which are favored by the new macroeconomic regime. MTEySS (2007) reports that in 2003-2005 the entry rate reached the highest value in the last 10 years and, because of the process of firm dynamics, it was likely that in the next periods market selection mechanisms produce an adjustment in the stock of firms, which is shown here. Nevertheless, apart from economic cycles, it is remarkable that entries represent more than 10% of total incumbents in all the years of the period.

¹¹ See Mundlak (1975) for details.

¹² It refers to private and formal firms from the EBDO database.

¹³ These five jurisdictions also concentrate 62% of the population, 75% of expenditures in science and technology activities, 77% of university degrees, 62% of universities, 85% of exports of manufactured products, 71% of the GDP and 80% of manufacturing value added in 2003.

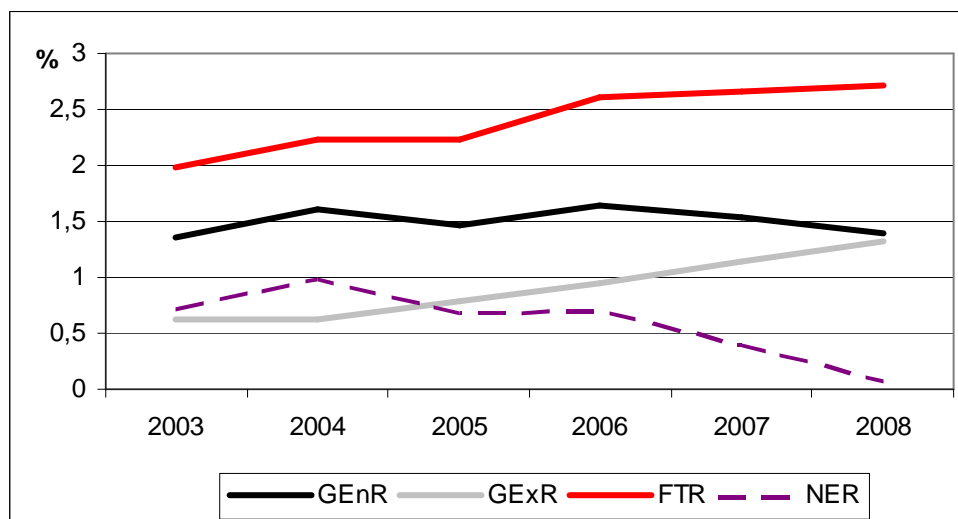
Table 2. Entry, exit and incumbent firms (2003 – 2008)

Year	Entry	Exit	Incumbents
2003	4.986	2.330	42.754
2004	5.994	2.326	45.234
2005	5.486	2.929	48.317
2006	6.264	3.623	49.987
2007	5.886	4.358	51.796
2008	5.389	5.103	52.417

Source: own calculations from data in EBDO

Graph 1¹⁴ displays the evolution of the Gross Entry Rate over the period, as well as the Gross Exit Rate (per 10.000 inhabitants, GExR), the Net Entry Rate (NER= GEnR – GExR) and the Firm Turnover Rate (FTR= GEnR+ GExR).

Graph 1: Entry, Exit, Net Entry and Turnover Rates



GEnR: Gross Entry Rate; GExR: Gross Exit Rate; FTR: Firm Turnover Rate; NER: Net Entry Rate

Table 2 displays entry and exit rates at a province level for 2003 and 2008. (Figure 1 in appendix shows entry and exit rates at a province level for the whole period). For this period of time net entry rates decrease considerable due to an important increase on exit rates (from 0,632 new firms per 10.000 inhabitants in 2003 to 1,316 in 2008), even though entry rates slightly increase (from 1,353 to 1,390).

¹⁴ Graph 1 shows some measures according to population approach and it does not differ significantly from the one showing the same results according to the ecological perspective. Nevertheless, regional rates do differ between the two perspectives, given that population is more homogeneously distributed across Argentinian regions than firms are.

Table 2. Entry and exit rates by provinces (2003 and 2008)

Province	2003					2008				
	Stock	Entry	Exit	GEnR	GExR	Stock	Entry	Exit	GEnR	GExR
Bs. As. (Rest)	4.888	597	251	1,143	0,480	5.981	637	623	1,161	1,136
Capital	8.787	1.101	611	4,007	2,223	10.516	1.080	1.149	4,056	4,315
Catamarca	151	19	10	0,548	0,288	177	13	18	0,335	0,464
Córdoba	3.803	489	216	1,569	0,693	4.886	552	493	1,687	1,506
Corrientes	240	48	25	0,503	0,262	341	57	36	0,554	0,350
Chaco	376	48	22	0,476	0,218	449	82	49	0,753	0,450
Chubut	312	45	22	1,065	0,521	383	50	48	1,104	1,059
Entre Ríos	947	129	52	1,092	0,440	1.233	154	93	1,227	0,741
Formosa	88	19	15	0,379	0,299	125	17	13	0,308	0,236
GBA	12.413	1.213	557	1,378	0,633	15.107	1.343	1.384	1,463	1,508
Jujuy	170	13	7	0,207	0,111	200	36	17	0,526	0,248
La Pampa	241	23	8	0,752	0,262	298	24	23	0,734	0,703
La Rioja	116	7	7	0,231	0,231	131	14	14	0,406	0,406
Mendoza	1.866	225	122	1,400	0,759	2.260	224	222	1,321	1,310
Misiones	820	143	28	1,435	0,281	1.015	109	95	0,994	0,866
Neuquén	251	33	14	0,675	0,286	337	52	41	0,968	0,763
Río Negro	388	47	22	0,839	0,393	460	80	51	1,370	0,873
Salta	327	35	26	0,314	0,233	403	60	49	0,484	0,395
San Juan	510	44	21	0,692	0,330	591	51	51	0,744	0,744
San Luis	384	26	25	0,680	0,654	407	35	37	0,812	0,859
Santa Cruz	103	16	9	0,787	0,442	132	19	15	0,846	0,668
Santa Fe	4.785	573	212	1,889	0,699	5.964	530	482	1,690	1,537
Santiago	203	24	10	0,290	0,121	248	31	20	0,344	0,222
T. del Fuego	123	15	6	1,400	0,560	149	15	21	1,170	1,638
Tucumán	462	54	32	0,394	0,233	624	124	59	0,838	0,399
TOTAL	42.754	4.986	2.330	1,353	0,632	52.417	5.389	5.103	1,390	1,316

Source: authors with data from EBDO.

The spatial distribution of such entry and exit rates shows that there is not a clear positive effect of the surrounding areas of the capital of the country (GBA and Rest of Buenos Aires province), since entry rates are around the mean (and even below it) and exit rates are around the mean too. Nevertheless, there is a huge concentration of entries and exits at the capital city, where such rates (data from 2008) multiply per 3 the average of the country.

Results. Correlation coefficients between dependent and explanatory variables are shown in Table 4, and most of them have the expected sign. Summary statistics of the these variables are displayed in Table 5.

Table 4. Correlation coefficients between dependent and explanatory variables

	GE _n R	GE _x R	DENS.	DENS.2	POVER TY	PRIVATE _EMPL.	LATE_ IMM.	ACT._ RATE	UNEMP. _RATE	NON_ REG	SEC_ SCH	NON_ ED	IND._ SHARE	LOW_ BARR.	MIDDLE _BARR.	HIGH_ BARR.
GE _n R	1,000															
GE _x R	0,872	1,000														
DENSITY	0,823	0,794	1,000													
DENSITY2	0,810	0,783	0,989	1,000												
POVERTY	-0,437	-0,544	-0,242	-0,248	1,000											
PRIVATE_EMPLOYEE	0,518	0,506	0,341	0,275	-0,196	1,000										
LATE_IMMIGRATION	0,188	0,169	0,055	0,051	-0,489	-0,249	1,000									
ACTIVITY_RATE	0,677	0,623	0,548	0,522	-0,509	0,381	0,347	1,000								
UNEMPL_RATE	0,057	-0,129	0,042	0,008	0,489	0,245	-0,273	0,222	1,000							
NON_REG	-0,279	-0,361	-0,159	-0,175	0,695	0,020	-0,597	-0,339	0,334	1,000						
SEC_SCH	-0,059	0,071	-0,109	-0,114	-0,437	-0,150	0,399	-0,006	-0,322	-0,444	1,000					
NON_ED	-0,167	-0,196	-0,189	-0,206	0,369	-0,053	-0,230	-0,343	0,162	0,238	-0,153	1,000				
INDUSTRY_SHARE	0,335	0,270	0,206	0,094	0,119	0,580	-0,129	0,177	0,249	0,229	-0,193	0,111	1,000			
LOW_BARRIERS	0,666	0,682	0,845	0,831	-0,203	0,290	-0,030	0,509	0,089	-0,041	-0,071	-0,229	0,230	1,000		
MIDDLE_BARRIERS	-0,686	-0,629	-0,523	-0,466	0,363	-0,578	-0,242	-0,705	-0,187	0,147	0,032	0,145	-0,484	-0,569	1,000	
HIGH_BARRIERS	0,537	0,464	0,275	0,214	-0,345	0,561	0,295	0,623	0,183	-0,156	-0,009	-0,078	0,475	0,266	-0,944	1,000

Table 5. Summary statistics for variables for regressions¹⁵

Variable	Obs	Mean	Std. Dev.	Min	Max
GE _n R	150	1,081	0,844	0,207	5,321
GE _x R	150	0,660	0,607	0,078	4,315
DENSITY	150	649,945	2680,305	0,834	13739,750
DENSITY2	150	7,56E+06	3,60E+07	0,695	1,89E+08
POVERTY	147	0,323	0,169	0,022	0,687
PRIVATE_EMPLOYEE	147	3,248	1,589	1,098	9,145
LATE_IMMIGRATION	147	0,197	0,127	0,053	0,619
ACTIVITY_RATE	147	0,431	0,041	0,335	0,539
UNEMPLOYMENT_RATE	147	0,084	0,040	0,010	0,190
NON_REG	147	0,438	0,100	0,135	0,600
SEC_SCH	147	0,226	0,032	0,136	0,322
NON_ED	147	0,006	0,004	0,000	0,020
INDUSTRY_SHARE	150	0,094	0,038	0,049	0,253
LOW_BARRIERS	150	0,056	0,044	0,003	0,247
MIDDLE_BARRIERS	150	0,626	0,129	0,332	0,841
HIGH_BARRIERS	150	0,318	0,110	0,095	0,549

The results of the econometric estimation are presented in Table 6. The F test, which rejects the hypothesis that the intercept terms are invariant across provinces, was used. Therefore, panel data were estimated because they take into account the variance of the intercept. The choice of whether estimate “random” or “fixed” panel data is made through the Hausman test. A fixed effect model was applied because we reject the hypothesis that the coefficients in both models are similar, and consequently, random-effect estimator would be inconsistent (individual effects are supposed to be correlated with some explanatory variables). Besides, the panel comprises observations on a fixed and relatively small set of units of interest (all Argentinian provinces) and we are not interested in making inferences beyond the sample.

¹⁵ In variables taken from the Household Permanent Survey, the number of observations is 147 because Río Negro Province was included in such survey only from year 2005.

The dependent variable is the Gross Entry Rate ($GENR_{it}$), following the population approach. The negative and significant coefficient of the $GEXR_{it}$ shows that entry and exit are inversely related within provinces. This shows that entries and exits of markets are not independent processes (*ceteris paribus* the features of the productive structure of firms in each province, proxied by $LOW_BARRIERS_{it}$ and $MIDDLE_BARRIERS_{it}$). This result confirms previous findings of Günalp and Cilasun (2006) for Turkey regarding a negative effect of past exits over current entries, but contrasts with Arauzo-Carod *et al.* (2007), Arauzo-Carod and Teruel (2005), Sutaria and Hicks (2004) and Love (1996), who find that entry and exit rates are positively related within Spanish regions, Spanish municipalities, Texas Metropolitan and Primary Metropolitan Statistical Areas (MSAs and PMSAs) and British counties, respectively. Since interaction of entries and exits seem to vary according to the development level of the economy, it is possible that while for developed economies higher exit rates imply leaving room for new entries, for developing economies (not yet saturated) higher exit rates imply structural weakness of local markets that make them less attractive for new firms. Besides, it is likely that, along this period of economic growth, entries have increased in all regions, but, while some provinces are more capable of attracting and maintaining new firms (and have, consequently, high entry rates and low exit rates) other provinces rather drive them out (and have low entry rates and high exit rates).

Table 6. Estimates of effects of regional characteristics on GENR

Fixed-effects (within) regression						
Number of obs = 147			Obs per group: min			3
Number of groups = 25			Avg			5,9
R-sq: within = 0.2949			Max			6
between = 0.6119			F(14, 108)			3,23
overall = 0.5905			Prob > F			0,0003
	Coef.	Std. Err.	t	P>t	[95% Conf.Interval]	
GEXR	-0,436	0,106	-4,120	0,000	-0,646	-0,226
DENSITY	0,005	0,003	1,470	0,145	-0,002	0,011
DENSITY2	-2,44E-07	0,000	-2,000	0,048	0,000	0,000
POVERTY	-0,966	0,261	-3,700	0,000	-1,484	-0,448
PRIVATE_EMPLOYEE	-0,014	0,032	-0,440	0,664	-0,078	0,050
LATE_IMMIGRATION	-0,511	1,183	-0,430	0,667	-2,856	1,835
ACTIVITY_RATE	2,360	1,044	2,260	0,026	0,291	4,429
UNEMPLOYMENT_RATE	-0,650	1,053	-0,620	0,538	-2,737	1,436
NON_REG	0,632	0,294	2,150	0,034	0,050	1,214
SEC_SCH	-0,771	0,834	-0,920	0,358	-2,424	0,883
NON_ED	12,451	5,554	2,240	0,027	1,441	23,461
INDUSTRY_SHARE	0,445	5,837	0,080	0,939	-11,125	12,015
LOW_BARRIERS (1)	0,434	2,368	0,180	0,855	-4,259	5,127
MIDDLE_BARRIERS (1)	0,053	1,067	0,050	0,961	-2,062	2,167
CONSTANT	-0,524	1,814	-0,290	0,773	-4,120	3,072

(1) Note: base category: HIGH_BARRIERS

F test that all $u_i=0$:	F(24, 108) = 10,27	Prob > F = 0,0000
Hausman test:	Chi-Sq. (14) = 278,22	Prob > Chi Sq = 0,0000

DENSITY_{it} (associated with the benefits of a bigger market and the existence of agglomeration economies) is positive but not significant. These results agree with those of Audretsch and Fritsch (1994), Guesnier (1994) and Gaygisiz and Köksal (2003). However, the negative effects of a high level of agglomeration (DENSITY2_{it}) are significant, implying that diseconomies like congestion, higher wages and land prices, among others, discourage entry of new firms.

The income level of the province (proxied by POVERTY_{it})¹⁶ is also significant and has the expected sign, which means that higher the poverty level of the region, lower is the entry rate of new firms. It should be noted that this variable may also proxy some characteristics of human capital of the province, especially when it is long-term poverty.

Our results regarding the ACTIVITY_RATE_{it} show that the creation of new firms is positively influenced by the existence of a pool of potential entrepreneurs (Fritsch and Falck, 2007), so it seems that such availability of labor is a necessary condition for new firm creation. According to our results there is no evidence on the so-called “unemployment push hypothesis”, given that the unemployment variable (UNEMPLOYMENT_RATE_{it}) is neither positive nor significant. This is not a surprising result, since many unemployed people start their business in the informal sector, and those new firms are not included in our database. The model also shows that labor instability (NON_REG_{it}) push individuals to start their own business.

Variables that proxy cultural attitudes were not significant¹⁷. This may suggest that differences regarding entrepreneurial attitude might be mainly across nations, not across regions (Davidsson and Wiklund, 1997) or, on the contrary, that those differences could be significant among areas smaller than provinces, such as cities. However, Gennero *et al.* (2004) do not find a significant influence of migration on gestation rates of new firms among cities in Argentina. In any case, in some empirical studies (mentioned by Davidsson and Wiklund, 1997), it was found that cultural and economic-structural determinants of the new firm formation rate were positively correlated, so that the unique contribution of each type of explanation could not be determined.

¹⁶ INDIGENCE was also highly significant in alternative specifications. Results can be obtained upon request.

¹⁷ In other specifications other variables that proxied the same concepts were included (the percentage of population who comes from outside the province in the last five years and the percentage of self-employed people) and none of them was significant. Results can be obtained upon request.

Characteristics of human capital were not significant and neither had the expected sign, which means that the availability of skilled labor do not influence entry decisions¹⁸. However, the model shows that as the percentage of population without formal education increases, gross entry rates also increases. We think there may be more entries in regions with lower education because of industry factors that the model fails to control¹⁹. The variable used to proxy the existence of the necessary infrastructure for a manufacturing firm to operate ($INDUSTRY_SHARE_{it}$) was not significant^{20,21}.

If we suspect that there is heteroskedasticity in the idiosyncratic error term, ε_{it} , we could compute robust standard errors. Table A.3 (see Appendix) displays these results. It is remarkable that $DENSITY_{it}$ is significant and has the expected sign; that is, provinces more densely populated are expected to have more entry of firms, *ceteris paribus*. As this paper is a result of a work still in progress, further research needs to be done in order to improve the estimated model.

Fixed effects may also be taken into account in an OLS regression with dummy variables that are specific for each province. Even though estimated coefficients for the independent variables are the same, individual effects may be recovered and estimated. These results are shown in Table 7. *Ceteris paribus*, more entry rate is expected in Córdoba and Santa Fe, in comparison to Rest of Buenos Aires Province (base category). Concretely, these are the provinces relatively more developed among the ones that have statistically significant individual effects. Additionally, for the rest of the provinces in Table 7 (which are lagging behind) less entry rate is expected (*ceteris paribus*). These results show that there are still some variables (non included in the model and maybe non observable) that cause higher entry rates in those provinces which are relatively more developed.

¹⁸ This could be explained because industry requires different kinds of skilled workers (people with high school, professionals, etc.). Thus, several variables were included in the model -proportion of people with a degree, percentage of people who finished high school plus people with uncompleted degree, among others- but none of them was significant.

¹⁹ In further research, alternative measures of barriers to entry should be considered.

²⁰ In alternative specifications, in which we could not separate GBA from the Rest of Buenos Aires Province, other variables regarding characteristics of infrastructure were included: km of roads, roads per km², number of universities and number of public and private graduates per year. In any case, none of them was significant. Results can be obtained upon request.

²¹ Policy measures may also affect the entry of new firms. In Argentina, in 1973 a policy of industrial promotion began, which granted benefits to companies that settle in the provinces of Catamarca, La Rioja, San Luis, San Juan and Tierra del Fuego. However, the fixed effect estimator is not able to estimate the effect of time invariant regressors. Nevertheless, Gatto (2007) shows that territorial inequalities, as well as the pattern distribution of firms, have not significantly changed until today.

Table 7. Estimated individual effects (only statistically significant)

Number of obs = 147		F(38, 108)	90.02
R-squared	0.9694	Prob > F	0.0000
Adj R-squared	0.9586	Root MSE	0.17866

	Coef.	Std. Err.	t	P>t	[95% Conf. Interval]
Catamarca	-0,651	0,232	-2,802	-1,111	-0,190 -0,651
Chaco	-0,567	0,284	-1,992	-1,130	-0,003 -0,567
Córdoba	0,781	0,228	3,431	0,330	1,233 0,781
Corrientes	-0,499	0,276	-1,812	-1,045	0,047 -0,499
Formosa	-0,744	0,318	-2,34	-1,373	-0,114 -0,744
Jujuy	-0,893	0,183	-4,884	-1,256	-0,531 -0,893
La Rioja	-0,866	0,223	-3,883	-1,308	-0,424 -0,866
Salta	-0,715	0,219	-3,266	-1,148	-0,281 -0,715
Santa Fe	0,916	0,355	2,582	0,213	1,620 0,916
Santiago	-0,851	0,276	-3,083	-1,398	-0,304 -0,851
Tucumán	-0,870	0,245	-3,553	-1,355	-0,385 -0,870

Note: Base category: Rest of Bs. As. province

Finally, as usual in spatial analysis, we tried to detect spatial correlation among provinces. That is, we intended to examine the extent to which the establishment of new concerns in a particular site is driven by the characteristics of that particular site and/or by the (average) characteristics of the surrounding area. Different spatial neighbour matrixes were used, but no spatial correlation was detected, because of the extended size of Argentinian provinces.

5. Conclusions

The primary aim of this paper was to analyse regional determinants of firm entry in a developing country. This paper contributes to extant literature on firm demography by analysing the specific case of a developing economy, for which the empirical evidence is still scarce. Through the paper, we have shown that entry determinants are not exactly the same as in developed economies, where there is a well-established list of economic, demographic and institutional characteristics that determine entry decisions of new firms. In particular, we found a negative effect of exit rate on entry rate and a significant influence of poverty and non-registered employment. Besides, some variables that usually explain entry rates in developed countries were not significant. These findings insinuate, like in Fritsch *et al.* (2006), that determinants of entry and exit process in developing countries may differ from the ones identified in developed nations. Even if acknowledging that Argentinian case could differ from other developing economies, it seems clear that the phenomenon is not the same as in Europe, Japan or the U.S.. Additionally, such disparities could suggest to use different

econometric techniques than in previous analysis, given the considerable differences among them.

Further extensions of this work should point to solve some specific shortcomings identified here and should advance our understanding about entry processes in a developing economy. Some of those extensions include the possibility of incorporating additional sectoral variables, as well as the estimation of the joint influence of several variables. Besides, it could be tested the effect of the explanatory variables over different sort of firms (specially domestic and foreign firms). Another shortcoming to be solved is about how to deal with an uneven distribution of economic activity across the country due to a huge concentration around its capital, which is a typical situation of a developing country.

Finally, regarding policy implications, this analysis suggests that policy measures to be taken in developing economies are not necessarily the same than in more developed economies. Therefore, policy makers should take into account country specificities before designing entry-promoting policies and not only follow previous ones adopted in those countries. In particular, given the effect that poverty has on regional entry rates, it seems that entry promotion policies should be more comprehensive, taking into account possible effects of poverty and long-term unemployment on human capital and market dynamics in certain provinces. The point is that both variables not only mean low income but also low education, barriers to external funding and smaller innovative behaviour.

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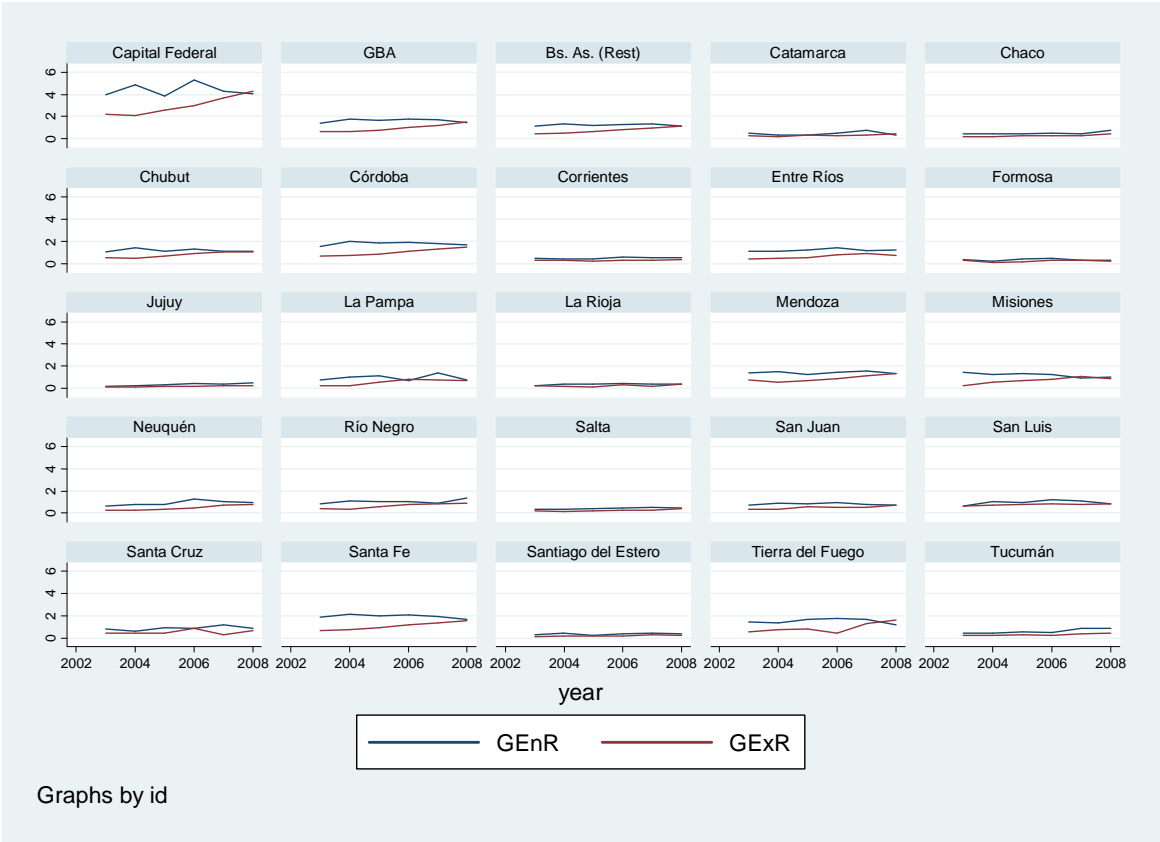
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Figures

Figure 1: Entry and exit rates at province level (all the years)



Source: authors from data in EBDO

Appendix

Table A.1. Industry classification

Code	Industry	Year 2008	
		% firms	%employees
15	Manufacture of food products and beverages	22,6%	26,6%
16	Manufacture of tobacco products	0,0%	0,4%
17	Manufacture of textiles	4,9%	5,5%
18	Manufacture of wearing apparel; dressing and dyeing of fur	6,8%	4,5%
19	Tanning and dressing of leather; manufacture of luggage, handbags, saddlery, harness and footwear	3,0%	3,3%
20	Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	5,9%	3,2%
21	Manufacture of paper and paper products	1,5%	2,5%
22	Publishing, printing and reproduction of recorded media	6,9%	4,8%
23	Manufacture of coke, refined petroleum products and nuclear fuel	0,1%	0,5%
24	Manufacture of chemicals and chemical products	4,1%	7,0%
25	Manufacture of rubber and plastics products	5,3%	5,4%
26	Manufacture of other non-metallic mineral products	3,3%	3,4%
27	Manufacture of basic metals	2,1%	3,5%
28	Manufacture of fabricated metal products, except machinery and equipment	14,4%	8,7%
29	Manufacture of machinery and equipment n.e.c.	5,8%	5,9%
30	Manufacture of office, accounting and computing machinery	0,3%	0,3%
31	Manufacture of electrical machinery and apparatus n.e.c.	1,9%	1,9%
32	Manufacture of radio, television and communication equipment and apparatus	0,2%	0,4%
33	Manufacture of medical, precision and optical instruments, watches and clocks	1,0%	0,7%
34	Manufacture of motor vehicles, trailers and semi-trailers	2,8%	6,7%
35	Manufacture of other transport equipment	0,8%	1,0%
36	Manufacture of furniture; manufacturing n.e.c.	5,7%	3,4%
37	Recycling	0,3%	0,3%

Note: Data = Entry + Incumbent - Exit

Source: International Standard Industrial Classification. Rev. 3

Table A.2. Regional concentration in Argentina. Year 2003.

Variable	Capital Federal	Buenos Aires (GBA+Rest)	Córdoba	Santa Fe	Rest of country	TOTAL
Area	0%	11%	6%	5%	78%	100%
Population	7%	38%	8%	8%	38%	100%
Number of firms	20%	40%	9%	11%	19%	100%
Number of industrial employees	18%	41%	8%	12%	21%	100%
Value Added	21%	34%	8%	8%	29%	100%
Industrial Value Added	19%	47%	6%	7%	20%	100%
Graduates	35%	21%	14%	7%	23%	100%
Universities	27%	20%	6%	9%	38%	100%
Exports of primary products and energy	0%	28%	11%	9%	52%	100%
Exports of manufacturing	19%	47%	6%	7%	20%	100%
R&D expenditures	28%	32%	8%	7%	25%	100%

Source: authors from EBDO, Household Permanent Survey, National Institute of Statistics and Census yearbook and Economic Commission for Latin America and the Caribbean (ECLAC).

**Table A.3. Estimates of effects of regional characteristics on GenR²².
Robust Standard Errors**

Fixed-effects (within) regression						
Number of obs = 147		Obs per group: min				3
Number of groups = 25		avg				5,9
R-sq: within = 0.2949		max				6
between = 0.6119		F(13,24)				11,15
overall = 0.5905		Prob > F				0,00000

	Coef.	Robust Std. Err.	t	P>t	[95% Conf.Interval]	
GExR	-0,436	0,118	-3,69	0,001	-0,680	-0,192
DENSITY	0,005	0,002	2,13	0,044	0,000	0,009
DENSITY2	-2,44E-07	0,000	-2,59	0,016	0,000	0,000
POVERTY	-0,966	0,331	-2,92	0,007	-1,649	-0,284
PRIVATE_EMPLOYEE	-0,014	0,019	-0,74	0,466	-0,053	0,025
LATE_IMMIGRATION	-0,511	1,026	-0,50	0,623	-2,628	1,607
ACTIVITY_RATE	2,360	0,693	3,41	0,002	0,931	3,789
UNEMPLOYMENT_RATE	-0,650	0,776	-0,84	0,410	-2,251	0,951
NON_REG	0,632	0,369	1,71	0,100	-0,131	1,394
SEC_SCH	-0,771	0,879	-0,88	0,390	-2,586	1,044
NON_ED	12,451	5,070	2,46	0,022	1,987	22,915
INDUSTRY_SHARE	0,445	6,604	0,07	0,947	-13,185	14,076
LOW_BARRIERS (1)	0,434	1,863	0,23	0,818	-3,412	4,280
MIDDLE_BARRIERS (1)	0,053	0,815	0,06	0,949	-1,629	1,734
CONSTANT	-0,524	1,363	-0,38	0,704	-3,336	2,288

²² The F test of $u_i=0$ is suppressed because it is too difficult to compute the robust form of the statistic when there more than a few panels (StataCorp., 2007).