FIRM DEMOGRAPHY, INNOVATION AND REGIONAL ECONOMIC GROWTH

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ABSTRACT

Schumpeterian theories link entrepreneurial demography and economic growth. After a brief presentation and discussion of antecedents, we propose the net entry rate as an indicator of the innovative content of entrepreneurial processes. An empirical research, using data relative to Belgian subnational entities, is then conducted. We test the innovative firm demography effects on subsequent economic growth. Although our results must be interpreted cautiously, they lead us to conclude that the innovative firm demography, as we measure it, should have had positive lagged effects in the services industry during the studied period. No effects are found in manufacturing.

I. INTRODUCTION

Entrepreneurial demography, as it could be grasped through the intertemporal phenomena of firm births and deaths, would be a vector for innovation. Consequently, it should have a positive effect on economic growth. As firm birth and death rates vary among the regions of a given country, they could be a source of explanation for the spatial variations of growth rates at a regional level. These assumptions have been already tested by aggregate approaches (see JOHNSON and PARKER, 1996; DEJARDIN, 1998a) with differing results. Being far from closing this field of research, the previous works are fostering more detailed and cautious investigations, particularly more respectful towards the sectoral composition and the effective structural changes of the economy.

In this paper, we suggest that the net birth rate of firms would be a good but imperfect indicator of the manner in which the entrepreneurial resources in a specific region are moving towards the most profitable and growing economic sectors.

As other researches point it out, the firm demography can be very different in intensity from one sector to another, and this for several reasons. A strict aggregate approach, i.e. using birth, death or net birth rates without taking any sectoral economic structure into account, involves consequently the risk of altering very highly the entrepreneurial process taking place in a given region (FRITSCH, 1996). Moreover, as the most detailed sectoral classification of firm births and deaths currently available is almost unable to render the emergence of new products and markets, a sectorally adjusted rate must be defined in such a way that it reflects by approximation the innovative nature of the entrepreneurial demography. Therefore, building on the previous literature, we specify a sectorally adjusted net birth rate which integrates some arguments coming from the classic shift-share analysis.

The theoretical part of the paper, together with the entrepreneurial indicator we built, are then used to write out and to test an econometric model for the effects of innovative firm demography on subsequent economic growth. These empirical works are relative to Belgian districts (the 43 “arrondissements”) for a period from 1982 to 1996.

The structure of the paper is as follows. In the next section, we expose the theoretical framework which underlies our research. We give in the third section a description of the data and of the indicators we use in the correlation and regression analysis. The latter forms the fourth section. The fifth and last section is dedicated to our conclusions.

II. THEORETICAL FRAMEWORK

A large theoretical literature can be found attached more or less to the firm demography and the entrepreneurial processes. Some researches focus particularly on the firm births and deaths (or the creation and destruction of economic activities): *what can account for industrial and spatial variations of firm entry and exit rates ?* Looking at these latter contributions, DEJARDIN (1998; quoting STOREY, 1994) distinguishes explanatory arguments coming from:

- Industrial economics: entry and exit depend in particular on (expected) profits along with barriers to entry, economic growth, and costs of exit;
- Labour economics: inspired by KNIGHT (1921), some arguments explain the self-employment decision by an individual arbitration between expected revenues as an employee or through the development of its own business. High unemployment rates can have a positive effect on the entry rates but it should be observed that an unfavourable economic context could also have a negative effect by reducing the expected profits;
- Agglomeration economies theories: following MARSHALL (1890), the New Economic Geography (KRUGMAN, 1991, and subsequent researches; see BAUMONT (1998) for a very short survey) explains the spatial variations of economic growth and development through (dis-)agglomeration forces affecting the localisation of activities. Briefly, these forces can be associated with the economic competition, the size and growth of the markets, the diversification and availability of the inputs, the transaction costs, technological spillovers, spatial congestion,… History and self-reinforcing effects can operate.

Following the noteworthy survey by STOREY (1994), we mention also other factors which can be found in the empirical literature and which appear to have an influence. Some are used in econometric regression analysis as proxies to test some of the above arguments. So we can cite the size and the age of the firms, their structure or organisation, the quality of their management, their localisation, the industrial spatial density, the characteristics and qualities of the overall population,… Combinations of some of these factors are entering in particular cross-sectional analysis to explain spatial variations of birth rates[1].

With regard to the *interdependencies* between firm births (B_t) and deaths (D_t), JOHNSON and PARKER (1994, 1996) summarise the various causality relationships into three different effects: what they call the multiplier, competition and Marshall effects (table I).

Table I. The multiplier, competition and Marshall effects

	Expected sign of each effect		
	Multiplier	Competition	Marshall
$\delta B_t/\delta B_{t-1}$	+	-	n.a.
$\delta D_t/\delta D_{t-1}$	+	-	n.a.
$\delta B_t/\delta D_{t-1}$	-	+	n.a.
$\delta D_t/\delta B_{t-1}$	-	+	+

n.a. = not applicable
Source: JOHNSON and PARKER (1994).

Firm births in t-1 can have, on one hand, a positive effect on the number of firm births in the following period (multiplier effects), but, on the other hand, they can induce (potential) competition and reduce the number of subsequent entries.

[1] See for example the special issue of *Regional studies* (1994), REYNOLDS and LA PLANT (1993), SPILLING (1996), KANGASHARJU (1998), DEJARDIN (1996).

Firm deaths can affect positively the number of deaths in the next period (the effects of recession in one particular integrated industry, for example) (multiplier effects), but also diminish competition.

The so-called Marshallian effects refer to what can be interpreted at a more micro-level as the firm life-cycle: a firm birth must be followed some years later by a firm death. Consequently, the number of new firms in one period must determine the number of firm deaths in the following ones.

As JOHNSON and PARKER point it out, the interrelationships between births and deaths can be classified under relations of different signs. What we are able to measure in practice is the net effect of these relations.

If there are a lot of theoretical arguments to explain the firm demography[2], another question is the impact of this entrepreneurial processes on the subsequent economic growth. As we have seen, a theoretical relation exists from growth to firm births and deaths. A main positive feedback effect, from entrepreneurial demography to economic growth[3], should result from the innovation it theoretically conveys.

AUDRETSCH and FRITSCH (1996), FRITSCH (1996) discuss the link between industry turbulence (defined as "the simultaneous movement of firms into and out of a market", p. 138) and economic growth. Their research refers to the well known SCHUMPETER's theory of creative destruction (1911)[4]. To succeed in entering the market, especially under conditions such as unconstrained production capacities of the incumbent firms and no expanding demand, a new firm must innovate. Thus, a firm entry doesn't mean a simple new and additional production but appears to be a disequilibrating agent. By producing better, or better goods and services, the new firm will imply exits.

According to this theory, the intensity of the observed turbulence could be an indicator of the innovative processes which affect and ultimately renew the economic activities. The potential productivity increases, as well as the resources reallocation which becomes possible by this way as through the firm exits, should foster competitive advantage and overall economic development. So, high turbulence should be positively correlated with subsequent economic growth.

Some general considerations together with empirical evidences induce several circumstantial comments about the Schumpeter's thesis. They are not without incidence on the foregoing assessment of the empirical tests we can do.

Thus, could the firm turbulence be firmly associated with innovative processes ? According to the arguments cited at the beginning of this section, the firm birth and death rates seem to be determined by many factors. In some cases, exits, for example, could be better explained by

[2] Some other arguments, that we do not mention here, can also be found through the literature. For a noteworthy survey, see STOREY (1994).
[3] RAY (1988) gives an important list of entrepreneurial effects on economic development which should however be discussed.
[4] See AGHION and HOWITT (1992, 1998) for a stimulating formalisation of Schumpeter's ideas.

internal reasons such mismanagement due to inexperience or natural causes such natural death of the entrepreneur than innovative entries.

We can argue moreover that the incumbent firms can also innovate and induce productivity increases. To obtain this result, the threat of entry should be sufficient, as suggested by the theory of contestable markets (BAUMOL, PANZAR and WILLIG, 1982).

In some sectors, as in some retail trades, numerous entries and exits are observed (DEJARDIN, 1998b). But we can doubt about their innovative nature. At most we can probably see in the closing down and reopening of a luxury clothing shop in the historic centre of our cities the effect of an up-stream industrial change, or the consequence of an individual job reorientation and one concrete experience of the optimal allocation of resources.

Given the above observations, we suggest that the net birth rate, in place of turbulence rate, should be an alternative indicator of the manner in which the entrepreneurial resources in a specific region are moving towards the most profitable and growing economic sectors. This proposition can be compared with the stylised paths in the number of entries, exits and firms over the industry life-cycle presented by FRITSCH (1996) (Figure I).

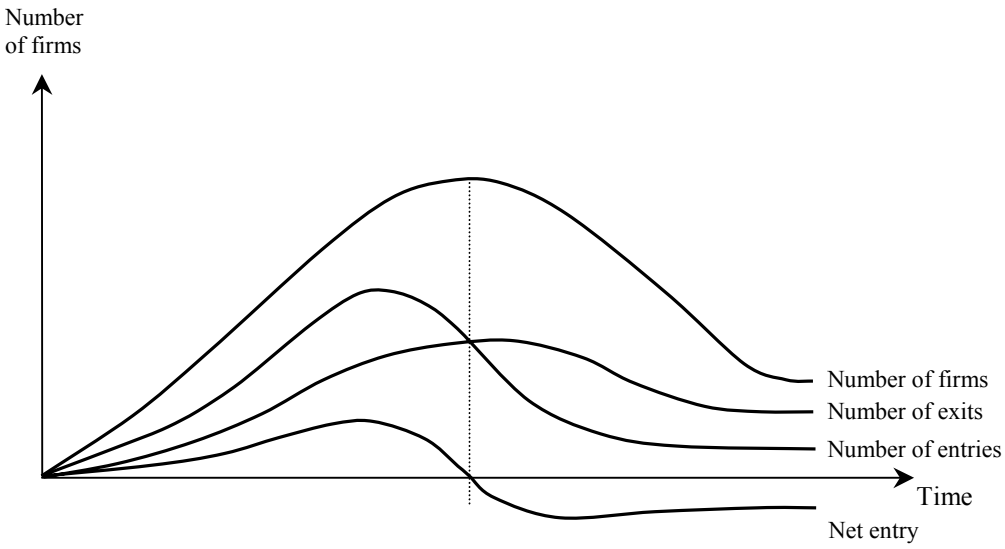

Fig. 1. Stylised paths in the number of entries, exits and firms over the industry life-cycle.
Source: FRITSCH (1996); see also AUDRETSCH (1995) and KLEPPER (1996).

High entry rates and relatively lower exit rate can be associated with "the expectation of increasing demand and favourable opportunities for gains in profits" in the early stages of the market. "Since many incumbent firms leave the market due to shrinking demand, it is reasonable to assume that in the later stages of the life-cycle the exit rate will be relatively high" (FRITSCH, 1996, p. 237). Thus the net entry rate should be positive in the growing period of the industry life-cycle. Taking into account relatively lower entry rates, it should be negative in the later period. We call here attention to the fact that innovation processes should still operate in the declining period.

We end up this short theoretical section with some important remarks for the empirical part of this research. Firstly, as it is already indirectly reported, very different situations in terms of entry and exit rates coexist among industries. An empirical entrepreneurial demography index should take into account of this fact, otherwise it risks to render an incorrect measure of the innovative processes (FRITSCH, 1996). Moreover, due to sectoral classification, there could be some distance between the actual nature of specific economic activities reported in the statistics for one region and the overall sectoral data. It should be interesting to integrate further differentiating informations by comparing specific net entry rates of a given region with a mean (national) rate. Secondly, as the new firms (and new industries) direct and indirect contribution to economic product can be very small (or even negative[5]) in their first years, an econometric test should allow for lagged effects. Thirdly and finally, as many variables can determine birth and death rates, so it is for net birth rates. It would be valuable to do some researches and to test in particular theoretical hypothesis explaining the spatial variations of this last potential indicator of innovation processes. Is it possible to find explanatory regional factors of its variations ? Do some regional convergence arguments matter ? It is this kind of questions which are discussed in DEJARDIN (1999).

III. DATA AND VARIABLES

The next table gives a synthetic view of the primary data that we use in the empirical part of this paper.

Measuring the births and deaths of firms is not an easy job in Belgium, given the statistical availability. The National Institute of Statistics, via the VAT National Office, collects however interesting data. Together with the stock of active registrations, it offers annual new registrations and deregistrations data series by sector and geographical subnational entities. Unfortunately, these data are collected and spatially distributed relatively to the location of the registered offices of the companies, not the operating offices, and relatively to the residence or the working place of the self-employees. Two arguments limit the disadvantages of these features as we are concerned by the effects of regional firm demography on regional economic growth. Firstly, it is *a priori* likely that, for a very large proportion of the new registrations, the registered and operating offices locations of companies coincide. Differences can surely be found, but more frequently for big companies (whom registered offices are located in the most important cities, particularly in Brussels). Secondly, the differences depend on the extent of the defining geographical area that we use. In our case, as it will be specified, the geographical area is the district (or "arrondissement") which, in Belgium, generally includes a mix of country and small- and medium-sized towns animating their surroundings.

[5] For a brief discussion, see FRITSCH (1996, 1997). There exists some previous empirical researches about the effects of firm demography on economic growth (for example, FRITSCH (1996), AUDRETSCH and FRITSCH (1996), ASHCROFT and LOVE (1996)). We note the fact that these cited contributions focus on the impact in terms of employment change, unlike JOHNSON and PARKER (1996) and DEJARDIN (1998) which estimate economic growth through employment and value added growth indicators. This paper will only present results with value added data.

Table II. Primary data, description and sources

Name	Description	Source
EN	Number of firm VAT new registrations	VAT, National Institute of Statistics
EX	Number of firm VAT deregistrations	VAT, National Institute of Statistics
ST	Stock of VAT registrations	VAT, National Institute of Statistics
VA	Annual gross value added at market prices	National Accounts Institute

To be counted at the end of the year, the new registrated firms must still be active at this moment. The deregistrations of the year, on the other hand, are added up without condition. So, there could be a systematic underestimation of the net number of new registrations. What appears to be statistical defects, or consequences of changes in the classifications and concepts employed, have been partly corrected by using the information given by the stock of firms differences, as (ST_t-ST_{t-1}) should be equal to (EN_t-EX_t).

The annual gross value added at market prices is published by the National Accounts Institute.

Given the above data, we construct a sectorally adjusted net entry rate (FRITSCH, 1996):

$$NEN_i^t = \frac{\sum_{j=1}^{n} (AEN_{ij}^t - HEN_{ij}^t) - (AEX_{ij}^t - HEX_{ij}^t)}{ST_{i\bullet}^t} \qquad (1)$$

where:

$NEN = Sectorally\ adjusted\ net\ entry\ rate$
$AEN = Actual\ number\ of\ entries$
$HEN = Hypothetical\ number\ of\ entries$
$AEX = Actual\ number\ of\ exits$
$HEX = Hypothetical\ number\ of\ exits$
$ST = Stock\ of\ firms$
$i = region\ i$
$j = industry\ j$
$t = period\ t$

The hypothetical numbers of entries and exits correspond respectively to the expressions:

$$HEN_{ij}^t = ST_{ij}^t * \frac{AEN_{\bullet j}^t}{ST_{\bullet j}^t} \qquad (2)$$

$$HEX_{ij}^{t} = ST_{ij}^{t} * \frac{AEX_{\bullet j}^{t}}{ST_{\bullet j}^{t}} \quad (3)$$

Note that a sectorally unadjusted net birth rate (*UNEN*) has been also calculated. It is equal to:

$$UNEN_{i}^{t} = \frac{(AEN_{i\bullet}^{t} - HEN_{i\bullet}^{t}) - (AEX_{i\bullet}^{t} - HEX_{i\bullet}^{t})}{ST_{i\bullet}^{t}} \quad (4)$$

The evolution of the regional value added, expressed in real terms, is given through what we call an annual gross value added *specific* growth rate (*SVAGR*):

$$SVAGR_{i}^{t} = \left(\frac{VA_{i}^{t} - VA_{i}^{t-1}}{VA_{i}^{t-1}} \right) - SVAGR_{\bullet}^{t} \quad (5)$$

Both entrepreneurial and economic growth indicators are computed for the 43 Belgian districts (the 43 "arrondissements"), and for the manufacturing and services sectors. The sectoral adjustment in the entrepreneurial variables rests on 26 and 30 subsectors, respectively for the periods 1981-1993 and 1994-1996, in the manufacturing case; and 22 and 26 subsectors, regarding the services.

Although the correct net entry rate implies to divide the defined numerator by the stock of firms at t-1, a change in the sectoral classification employed by the Belgian National Institute of Statistics in 1993 leads us to approximate the true value with the stock of firms at time t at the denominator.

The national overall GDP deflator is used in the construction of our economic growth indicators. At this time, it is not possible for us to go further into the geographic and sectoral disaggregation without further estimations. These comments complete the data and variables section. The following one presents the empirical results of our research.

IV. EMPIRICAL RESULTS

Before turning to a regression analysis, we present in the following tables the results of a simple correlation computation between the sectorally adjusted (and unadjusted) net birth rates and the subsequent annual value added specific growth rates.

Correlations

From the figures in table III, we draw three main comments about the relations between the sectorally adjusted net entry rates and subsequent economic growth in the services sector. Firstly, the signs of the correlations are globally positive whatever the annual net entry rate and the subsequent growth rate. Secondly, the intensity of the positive correlation coefficients is very different from one case to another. The value of the negative coefficients are generally

weak, except for one observation. Thirdly, we find out a concentration of high positive coefficients in the t+5 growth rates column.

Table III. Correlations between sectorally adjusted net birth rates of firms and subsequent annual value added specific growth rates in the services sector.

	Annual value added specific growth rates (*SVAGR*)						
Net entry rates	*t+0*	*t+1*	*t+2*	*t+3*	*t+4*	*t+5*	*t+6*
NEN96	0.0779						
NEN95	0.3986	0.0264					
NEN94	0.0890	0.4885	0.2766				
NEN93	0.0896	0.4252	0.4022	0.1884			
NEN92	0.0493	0.2458	0.3038	0.4207	0.2594		
NEN91	0.3503	0.1212	-0.0909	0.2259	0.2050	-0.0096	
NEN90	0.3587	-0.0589	0.2542	0.0452	0.4336	0.3845	-0.1162
NEN89	0.1289	0.2940	0.1174	0.1079	0.0927	0.3556	0.4168
NEN88	0.0417	0.0522	0.0989	0.0824	-0.0969	0.4388	0.1219
NEN87	-0.0330	0.0171	0.1911	0.2901	0.3349	-0.1617	0.1090
NEN86	0.1621	0.1880	0.0890	-0.1001	0.0711	-0.0289	-0.3352
NEN85	0.0239	0.2545	0.1368	-0.0723	0.1349	0.3747	0.0723
NEN84	0.2191	0.0798	-0.0235	0.2216	0.0731	0.3405	0.0955
NEN83	0.4616	0.0673	0.2675	0.1290	0.0971	0.2833	0.0718
NEN82	-0.1314	0.2853	0.0591	-0.0831	0.0920	0.0588	0.2017

With regard to the manufacturing sector (table IV), the correlation coefficients suggest nothing but a very unclear relation (if any). A few coefficients, with positive or negative signs, have high values, however it is impossible to distinguish structured or at least systematic phenomena.

Table IV. Correlations between sectorally adjusted net birth rates of firms and subsequent annual value added specific growth rates in the manufacturing sector.

	Annual value added specific growth rates (*SVAGR*)						
Net entry rates	*t+0*	*t+1*	*t+2*	*t+3*	*t+4*	*t+5*	*t+6*
NEN96	0.2231						
NEN95	-0.0163	-0.0336					
NEN94	0.5038	0.0437	0.1428				
NEN93	0.0261	0.2281	-0.0293	-0.0895			
NEN92	0.2295	-0.0555	0.1564	-0.0135	-0.2126		
NEN91	-0.3549	0.2430	0.2039	0.1224	0.0770	0.0507	
NEN90	0.0283	0.1299	-0.2057	0.0847	0.1673	-0.0873	0.1617
NEN89	-0.0161	-0.0813	0.0082	-0.1302	0.2253	0.1494	-0.0890
NEN88	0.3084	0.0602	-0.0296	-0.3099	0.3098	-0.2005	0.0035
NEN87	-0.2461	0.1211	-0.0306	-0.1166	-0.0841	0.1998	-0.0213
NEN86	-0.2746	-0.0163	-0.0788	0.0562	0.1591	-0.0210	0.0113
NEN85	-0.2359	0.0534	-0.3227	0.4240	-0.0923	-0.1453	-0.1477
NEN84	-0.0489	-0.0045	-0.2941	-0.1944	0.3187	-0.0918	-0.2262
NEN83	-0.0623	-0.4366	0.1223	0.0391	-0.4711	-0.0162	-0.0454
NEN82	0.1172	0.2148	0.0891	0.1746	0.2048	0.1638	-0.0705

In tables V and VI are reported the correlation analysis results for the sectorally unadjusted indicators. Although lightly less explicit for the services sector (table V) than the results with

the structurally adjusted indicators, they confirm general positive values for the coefficients with great disparities and a few weak negative correlations (except in one case). It is still not easy to give a structured interpretation of statistics for the manufacturing sector (table VI).

Table V. Correlations between sectorally unadjusted net birth rates of firms and subsequent annual value added specific growth rates in the services sector.

	Annual value added specific growth rates (*SVAGR*)						
Net entry rates	*t+0*	*t+1*	*t+2*	*t+3*	*t+4*	*t+5*	*t+6*
UNEN96	0.0800						
UNEN95	0.3380	0.0212					
UNEN94	0.1510	0.4492	0.2812				
UNEN93	0.0246	0.4899	0.2833	0.1541			
UNEN92	-0.0419	0.1748	0.3750	0.3222	0.2254		
UNEN91	0.3297	-0.0083	-0.1562	0.2985	0.0685	-0.0429	
UNEN90	0.2707	-0.0138	0.1178	-0.0391	0.4691	0.2103	-0.1552
UNEN89	0.1505	0.1905	0.1326	-0.0051	-0.0035	0.3733	0.2190
UNEN88	-0.0418	0.0771	0.0313	0.1007	-0.1708	0.2989	0.1504
UNEN87	-0.1380	-0.0561	0.1913	0.2104	0.3199	-0.2117	0.0412
UNEN86	0.0553	0.0596	0.0062	-0.0604	0.0364	0.0228	-0.3762
UNEN85	-0.0431	0.1539	0.0178	-0.1333	0.1741	0.3237	0.1290
UNEN84	0.1925	0.0376	-0.1078	0.1092	0.0127	0.3575	0.0627
UNEN83	0.3401	-0.0162	0.1204	0.0598	-0.0148	0.2520	0.0874
UNEN82	-0.1572	0.2947	0.0979	-0.0350	0.0851	0.0689	0.2042

Table VI. Correlations between sectorally unadjusted net birth rates of firms and subsequent annual value added specific growth rates in the manufacturing sector.

	Annual value added specific growth rates (*SVAGR*)						
Net entry rates	*t+0*	*t+1*	*t+2*	*t+3*	*t+4*	*t+5*	*t+6*
UNEN96	0.2082						
UNEN95	-0.0148	-0.0401					
UNEN94	0.4821	0.0598	0.1217				
UNEN93	0.0461	0.2260	-0.0223	-0.0847			
UNEN92	0.2286	-0.0356	0.1586	-0.0028	-0.2134		
UNEN91	-0.3366	0.2349	0.2490	0.1264	0.0913	0.0523	
UNEN90	0.0111	0.1682	-0.2239	0.1124	0.1688	-0.0789	0.1682
UNEN89	-0.0466	-0.1023	0.0357	-0.1516	0.2564	0.1398	-0.0757
UNEN88	0.3137	0.0518	-0.0467	-0.2981	0.3015	-0.1873	-0.0015
UNEN87	-0.2255	0.1317	-0.0580	-0.1327	-0.0506	0.1765	0.0012
UNEN86	-0.3379	-0.0129	-0.0676	0.0508	0.1390	-0.0194	-0.0065
UNEN85	-0.2354	-0.0002	-0.3224	0.4360	-0.1179	-0.1518	-0.1277
UNEN84	-0.0530	0.0003	-0.3366	-0.1833	0.3156	-0.1086	-0.2339
UNEN83	-0.0703	-0.4341	0.1204	-0.0023	-0.4751	-0.0174	-0.0586
UNEN82	0.1320	0.2032	0.0971	0.1702	0.1895	0.1677	-0.0576

Regression analysis[6]

The predefined data and indicators were also submitted to a regression analysis. They are entering the following econometric model:

$$SVAGR_i^t = \alpha + \beta_1 NEN_i^{t-1} + \beta_2 NEN_i^{t-2} + \beta_3 NEN_i^{t-3} + \beta_4 NEN_i^{t-4} + \beta_5 NEN_i^{t-5} + \beta_6 NEN_i^{t-6} + u_i$$

Nine equations of this type, corresponding to the regression analysis for the annual specific value added growth rate from 1988 to 1996, were estimated by seemingly unrelated regression (ZELLNER, 1962) using the "SUREG" function of the econometric Intercooled STATA 6.0 software package. The reason we used this technique, in place of OLS, is that the Zellner's method includes an estimation of the full variance-covariance matrix of the coefficients, allowing the disturbances across equations to be correlated (STATA, 1999). The application of this method produces better results in terms of variance of the estimators. The regressions outcomes are shown in tables VII and VIII.

Table VII. Regression results for the services sector with sectorally adjusted net entry rates.

	SVAGR88	***SVAGR89***	***SVAGR90***	***SVAGR91***	***SVAGR92***	***SAVGR93***	***SVAGR94***	***SVAGR95***	***SVAGR96***
Const.	0.00	0.00	0.01***	0.01***	0.01*	0.01**	-0.00	0.00**	0.00
NEN t-1	0.02	0.03	0.37	-0.68*	-0.31	1.22***	0.44**	0.51***	-0.12
NEN t-2	0.20	-0.18	-0.31	0.73	0.38	-1.16**	-0.21	-0.00	0.30*
NEN t-3	-0.27	-0.22	0.17	0.13	0.94*	-0.03	-0.03	0.32	0.04
NEN t-4	-0.29	0.43	0.00	0.59**	-0.25	-0.69	0.41**	-0.29	0.45**
NEN t-5	0.47**	0.89**	0.65**	-0.34	-0.60*	1.40***	0.29	0.41*	-0.02
NEN t-6	0.27*	-0.10	-0.05	-0.30	-1.28***	0.28	-0.21	0.27	-0.30*
"R-sq"	0.16	0.12	0.20	0.16	0.27	0.29	0.29	0.36	0.17
Chi2	9.43	7.16	11.76	8.58	14.85	26.77	21.30	34.57	18.46
P	0.1509	0.3065	0.0675	0.1987	0.0215	0.0002	0.0016	0.0000	0.0052

* = significant at 10%; ** = significant at 5%; *** = significant at 1%.

The regressions for the services sector bring in the following observations. Looking first at general diagnostic statistics reproduced at the bottom of table VII, we note an improvement in overall significance for the most recent years, with an inflexion for 1996. The R-square are given as rude indicators as they are imperfect with GLS regressions (see GREENE, 1997, pp. 508-509).

With regard to the estimated parameters, we find out significant positive coefficients relative to t-4 or t-5 lagged net entry rates in eight out of nine regressions. A less delayed significant positive effect can be observed in the most recent period, together with a singular *NENt-6* negative sign in the 1996 estimation. Two regressions, relative to the specific economic

[6] The regression results with the sectorally unadjusted net entry rates, not integrated in this paper, can be obtained from the author.

growth in 1991 and 1993, lead to particular comments as we note very similar values with opposite signs associated with the *NENt-1* and *NENt-2* variables — the *NENt-2* coefficient in the *SVAGR91* equation is almost significant at 10% (with a P-value equal to 0.102). These statistical observations should be linked to compensating effects within the regression.

Results for the *SVAGR92* and *SVAGR93* regressions are interesting given their contrasted aspects. The years 1992 and 1993 were characterised by an overall weaker economic growth (corresponding even to an economic recession in 1993) than the preceding period, and followed by a recovery in 1994. The relations between the entrepreneurial demography and the business cycles, their potential anticipation properties included, should be part of a forthcoming paper.

Table VIII. Regression results for the manufacturing sector with sectorally adjusted net entry rates.

	SVAGR88	***SVAGR89***	***SVAGR90***	***SVAGR91***	***SVAGR92***	***SAVGR93***	***SVAGR94***	***SVAGR95***	***SVAGR96***
Const.	0.01	-0.00	-0.00	0.03**	0.01	-0.02	-0.01	0.00	0.00
NEN t-1	-1.65	0.97	-1.25	0.51	0.92	-0.11	0.60**	0.49	0.21
NEN t-2	-1.23	-0.16	-0.21	0.08	-1.21*	2.56**	0.16	-0.12	0.22
NEN t-3	4.59***	0.35	0.36	-1.38**	-0.62	0.42	0.26	-0.44	0.14
NEN t-4	2.57*	-1.52	2.70**	0.29	1.15**	2.50**	1.05**	0.26	-1.03**
NEN t-5	-1.97**	0.07	0.55	0.22	0.56	-1.82*	0.30	-0.30	0.40
NEN t-6	-2.16**	-0.18	-2.14**	-0.66	-0.81	0.08	-0.17	-0.35	0.56*
"R-sq"	0.27	0.01	0.12	0.12	0.20	0.21	0.14	0.01	0.14
Chi2	22.50	3.55	8.26	7.07	16.26	12.06	11.10	3.30	9.56
P	0.0010	0.7378	0.2197	0.3145	0.0124	0.0607	0.0853	0.7707	0.1444

* = significant at 10%; ** = significant at 5%; *** = significant at 1%.

We note briefly about the estimations for the manufacturing sector (table VIII) weak and unreliable specification of the model, as well as very dissimilar coefficient signs.

V. CONCLUSIONS

Several researches can be found in the economic literature focusing on firm demography. This interest for such phenomena can probably be associated with Schumpeterian theories according to which entrepreneurial turbulence conveys innovation and fosters economic growth.

After a brief discussion of previous works, we have proposed the net entry rate as an indicator of the innovative content of entrepreneurial processes. An empirical research, using data relative to Belgian subnational entities, has been then conducted to test the innovative firm demography effects on subsequent economic growth.

Although our results must be interpreted cautiously, they lead us to the conclusion that the innovative firm demography, as we measure it, should have had positive lagged effects in the services sector during the studied period. No effects has been found concerning the manufacturing sector.

At two different places in this paper, we have evoked undergoing or forthcoming researches: thus, relative to potential explanatory factors for the spatial variations of the proposed indicator, on one hand; concerning the interrelationships between entrepreneurial demography and business cycles, on the other hand. Moreover the above projects and other more direct extensions of this paper (such as estimations with employment data), it seems to us that it would be valuable to consider spatial correlation of the entrepreneurial processes.

Finally, although the present paper represents one possible using, among others, of existing Belgian statistics, it would be interesting to investigate detailed longitudinal data, taking into account the kind of theoretical relations under examination.

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