The Determinants of Firm Start-up and Entry in Italian Producer Services

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ABSTRACT. In this paper the determinants of new firm formation in the producer services are studied by using National Security data on firms with at least one employee. Two ratios are computed and analysed for the 95 Italian provinces: an index of fertility represented by the share of new enterprises on employees, and a birth rate represented for each province by the ratio between new enterprises and resident population. On examination of the determinants of this process, we found that the average wage rates and the ratio of utilized credit to the total line of credit negatively affect both indexes, and that both indexes are affected positively by sector growth and by a measure of small firm presence. The index of fertility is also explained by a dummy variable which identifies for each province those policies which are aimed at fostering the process of new firm formation. The birth rate is instead affected by a dummy variable which is equal to one for the provinces in which the chief towns of each region are located and zero otherwise, and by the potential demand for new producer services arising from the industrial sector.

I. Introduction

The set of activities usually referred to as producer (or business) services has represented one of the most rapidly growing sectors in developed countries during the last two decades. This growth has been shown to result at least in part from a process of specialization and division of labour both within and among firms belonging to the same sector (cf. Caselli and Pastrello, 1984; Gillespie and Green, 1987), and it has been shown to be closely related to an increase in the amount of services required per unit of industrial output (cf. Momigliano and Siniscalco, 1982; Gershuny and Miles, 1984). Accordingly, the process of firm start-up and entry which has marked the overall growth of this sector can be seen as the result of two distinct phenomena: 1) the branching out of lower-order, and routinized functions from existing producer services firms (Coffey and Polèse, 1989); 2) the creation of new higher-order functions in connection with a process of technological innovation which involves the entire production system (Cappellin, 1986). In both cases, the observable outcome is a flow of new firms entering the market which has affected the organizational structure of producer services activities since the latter years of the 1970s.

This paper examines the determinants of the spatial distribution of new producer services firms in Italy during the period 1987–90 from each of the above two perspectives. In the second half of the 1980s the percentage of GNP generated by producer services grew significantly in the majority of Italian provinces and regions, although the extent of this growth, as revealed by statistical sources, may have been partly overestimated. In effect, it is likely that a portion of the free-standing producer services activities recorded by official data results from the decision of manufacturing firms to replace internalized functions with those purchased from external producer services firms. Thus, in this case the observed phenomenon is a growth of the producer services *sector*, whereas the extent of the producer services *function* in the economy has remained unchanged.

Given these premises, our study begins with

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description of two different indexes of new firm formation – one for each feature of the process identified above – constructed using a relatively new source of data for Italy (section II). Section III presents two simple models for analyzing the determinants of the distribution of new producer services firms by province, whereas in section IV the results of the empirical test of such models are discussed. Finally, in section V some concluding remarks are made.

II. Alternative measures of new firm formation

The availability of reliable data has always been an important obstacle to empirical studies of firm start-up and entry (for a review, cf. Vivarelli, 1991). As regards Italy, a source of information made available by the National Institute of Social Security (INPS) allows such studies to be carried out with a higher degree of reliability (cf. Contini and Revelli, 1992; Santarelli and Sterlacchini, 1994). INPS provides, at the sectoral level, yearly information on both newly and already established firms with at least one employee. Since firms are compelled by Italian laws to transfer national security payments for their employees to this Institute, the INPS file is the most complete source of information on firm start-up and exit. As well as providing information on firms starting or closing down their activity, the INPS file contains data on wages, the number of employees, and the annual change in employment (i.e. job creation minus job losses). The main shortcoming of this file, when used in geographical rather than sectoral studies, is that the unit considered is the *firm*, whose plants may be located in areas (provinces or even regions) other than that of the firm's office responsible for national security payments.

The use of INPS data allowed us to compute and analyse for the period 1987–90 two indexes of new firm formation in the producer services for the 95 Italian provinces: the first (FER) is an index of fertility (cf. Table I) represented by the share of new enterprises on employees of existing firms (cf. Johnson and Cathcart, 1979; Creedy and Johnson, 1983); the second index (BIR) is a typical birth rate (cf. Table II) represented for each province by the ratio between new enterprises and resident population (cf. Garofoli, 1992; Piergiovanni and Santarelli, 1994).

The index of fertility is designed to capture those processes of new firm formation which result from the branching out of the routinized functions of firms already operating in the sector. In this respect, the entry process relies on the employees' choice between offering their labour as workers or, alternatively, using their skills to start a new business. Following Kihlstrom and Laffont (1979), this choice is assumed to depend upon the expected utility of wages as compared with the expected utility of profit. It is also assumed that the decision to start a new business depends on the fact that employees of smaller firms can more easily acquire the managerial skills required to start a new firm than employees of larger firms (cf. Santarelli and Sterlacchini, 1994). Thus, familiarity with the sector and strong managerial capabilities (as in Lucas, 1978; and Blau, 1987) represent a sorting criterion of the potential entrants in the particular fringe of producer services activities considered when the FIR index is used.

The birth index captures the overall process of new firm formation in each province, and is therefore designed to take into account also that portion of the entry process which results from the creation of new functions in the sector. Several studies of industrial location (for a survey, cf. Garofoli, 1992) have proved this index to be the most appropriate method of calculating the rate of new firm formation at the local level. It relies, in fact, on the assumption that the total resident population in each geographical unit represents the largest possible source of new potential entrepreneurs.[1] In this case the entry process also involves activities which are entirely new for the sector. Thus previous experience in the producer services is not a necessary qualification for new entrepreneurs: as suggested by Jovanovic (1982), potential entrants have in effect only vague expectations about the potential demand for the new activity.

Of course, the FIR and BIR ratios are not the only possible measures of new firm formation. For example, firms and entrepreneurs which diversify their activity or which move from other sectors to the producer services might play a role in the process of new firm formation analysed here. However, owing to the segmentation of local markets, it is highly probable that in Italian

TABLE I
Rates of fertility in the producer services (1987–90)

	1987	1988	1989	1990	Mean		1987	1988	1989	1990	Mean
AG	7.17	3.49	3.01	4.08	4.44	MI	2.47	2.60	2.33	2.07	2.37
AL	4.92	4.09	4.38	3.78	4.29	MO	4.40	4.76	4.06	3.45	4.17
AN	4.16	3.44	2.71	2.98	3.32	NA	2.43	2.83	3.02	2.34	2.66
AO	3.39	5.45	4.76	3.94	4.39	NO	4.09	3.83	3.34	2.97	3.56
AR	3.90	4.93	4.37	3.31	4.13	NU	2.77	4.42	5.26	3.85	4.07
AP	6.93	6.88	4.67	4.78	5.82	PD	3.15	3.04	2.68	2.46	2.83
AT	2.60	3.29	2.63	2.71	2.81	PA	1.51	1.68	1.65	1.57	1.60
AV	6.44	5.12	3.52	1.67	4.19	PR	5.01	3.86	3.06	2.91	3.71
BA	3.46	3.20	3.10	3.10	3.21	PV	3.48	3.99	3.17	3.25	3.47
BL	5.98	4.49	4.09	5.37	4.98	PG	6.13	4.86	3.64	3.39	4.50
BN	5.11	8.70	5.29	4.39	5.87	PS	7.76	5.60	5.20	4.33	5.72
BG	3.82	3.14	3.28	3.56	3.45	PE	4.50	6.17	4.45	3.81	4.73
BO	5.14	4.76	3.43	3.28	4.16	PC	3.96	4.79	5.04	4.05	4.46
BZ	3.72	2.82	2.90	3.61	3.26	PI	4.66	4.59	3.81	3.56	4.16
BS	4.10	4.41	3.77	3.77	4.01	PT	4.10	4.58	3.82	3.08	3.89
BR	3.27	2.65	3.91	3.25	3.27	PZ	3.48	5.28	4.59	3.92	4.32
CA	4.49	3.86	3.65	2.86	3.72	RG	1.86	3.66	3.43	3.82	3.19
CL	5.34	3.95	4.85	4.10	4.56	RA	5.52	4.72	3.63	3.69	4.39
CB	4.44	5.21	4.64	4.63	4.73	RC	2.95	3.96	4.08	5.12	4.03
CE	2.62	3.52	3.93	4.02	3.52	RE	5.13	4.89	3.41	4.33	4.44
CT	3.12	3.22	3.30	2.17	2.95	RI	10.50	8.71	8.32	7.22	8.69
CZ	3.04	3.25	3.27	3.65	3.30	RM	2.43	2.30	2.02	1.77	2.13
CH	7.53	6.74	4.49	4.97	5.93	RO	4.20	5.78	5.47	4.36	4.95
CO	4.94	3.99	3.94	2.89	3.94	SA	4.89	5.01	5.36	3.76	4.76
CS	3.35	3.49	2.99	3.74	3.39	SS	3.77	3.37	2.39	1.57	2.78
CR	2.75	3.14	2.52	2.43	2.71	SV	4.04	4.68	4.85	4.02	4.40
CN	5.61	4.71	4.54	4.06	4.73	SI	3.84	4.58	4.94	3.22	4.15
EN	2.87	1.83	0.87	2.16	1.93	SR	4.92	5.00	5.77	3.09	4.69
FE	5.10	5.15	5.37	4.37	5.00	SO	2.49	3.22	4.95	4.84	3.87
FI	4.33	4.18	3.91	3.78	4.05	TA	4.57	5.72	3.19	3.17	4.16
FG	3.11	2.65	2.14	1.60	2.38	TE	7.47	5.86	4.47	4.56	5.59
FO	4.99	4.53	4.25	3.52	4.32	TR	5.63	6.81	7.90	6.10	6.61
FR	3.87	3.83	3.49	3.19	3.59	TO	2.49	2.45	2.16	1.88	2.25
GE	2.84	3.45	3.89	3.25	3.36	TP	4.71	5.59	4.46	2.25	4.25
GO	7.50	4.67	4.89	4.22	5.32	TN	5.53	4.21	4.59	3.38	4.43
GR	4.28	4.75	3.28	4.21	4.13	TV	5.22	4.92	5.23	3.33	4.68
IM	3.09	3.84	3.34	4.17	3.61	TS	3.61	2.91	3.00	2.83	3.09
AQ	5.19	6.04	4.46	5.14	5.21	UD	6.90	6.01	4.74	4.32	5.49
SP	3.00	3.58	3.84	2.76	3.29	VA	4.25	4.53	3.98	3.41	4.04
LT	5.73	6.32	4.82	4.21	5.27	VE	3.87	4.07	3.20	3.35	3.62
LE	5.93	4.75	3.99	2.89	4.39	VC	4.70	2.97	2.77	3.30	3.44
LI	2.54	3.82	3.08	3.00	3.11	VR	4.88	4.83	3.47	3.84	4.25
LU	4.74	5.31	4.50	2.86	4.35	VI	4.85	4.20	3.79	3.45	4.07
MC	3.92	5.57	2.32	3.31	3.78	VT	4.43	5.44	4.68	5.45	5.00
MN	4.28	3.11	3.46	4.61	3.86	PN	3.64	4.73	3.82	3.42	3.90
MS	5.09	4.73	5.45	3.32	4.65	IS	6.37	9.06	12.57	6.50	8.63
MT	4.91	5.00	4.42	3.73	4.51	OR	3.25	5.83	2.10	2.44	3.40
ME	2.81	3.47	2.85	4.01	3.28						
						Mean	4.40	4.46	3.98	3.58	4.11

Source: Elaborations on the INPS files.

TABLE II
Birth rates in the producer services (1987–90)[a]

	1987	1988	1989	1990	Mean		1987	1988	1989	1990	Mean
AG	0.07	0.03	0.03	0.05	0.05	MI	0.32	0.36	0.34	0.34	0.34
AL	0.16	0.15	0.17	0.16	0.16	MO	0.25	0.29	0.28	0.26	0.27
AN	0.17	0.15	0.13	0.15	0.15	NA	0.06	0.08	0.09	0.84	0.08
AO	0.21	0.39	0.37	0.32	0.32	NO	0.16	0.16	0.15	0.13	0.15
AR	0.15	0.22	0.21	0.16	0.18	NU	0.04	0.06	0.09	0.07	0.07
AP	0.17	0.19	0.14	0.15	0.16	PD	0.24	0.25	0.23	0.22	0.23
AT	0.11	0.14	0.12	0.13	0.12	PA	0.07	0.08	0.08	0.08	0.08
AV	0.12	0.10	0.08	0.04	0.08	PR	0.32	0.28	0.24	0.25	0.27
BA	0.10	0.10	0.10	0.12	0.11	PV	0.15	0.17	0.14	0.15	0.15
BL	0.17	0.14	0.14	0.21	0.17	PG	0.26	0.22	0.17	0.17	0.20
BN	0.06	0.12	0.08	0.06	0.08	PS	0.22	0.18	0.18	0.17	0.19
BG	0.19	0.17	0.19	0.22	0.19	PE	0.16	0.25	0.21	0.20	0.20
BO	0.36	0.37	0.30	0.32	0.34	PC	0.16	0.20	0.23	0.19	0.19
BZ	0.19	0.15	0.16	0.22	0.18	PI	0.20	0.21	0.19	0.19	0.20
BS	0.21	0.24	0.23	0.25	0.23	PT	0.20	0.23	0.20	0.17	0.20
BR	0.06	0.05	0.08	0.07	0.06	PZ	0.08	0.14	0.15	0.14	0.13
CA	0.11	0.11	0.12	0.11	0.11	RG	0.03	0.07	0.07	0.08	0.06
CL	0.07	0.05	0.07	0.06	0.06	RA	0.24	0.23	0.20	0.24	0.23
CB	0.07	0.09	0.09	0.10	0.09	RC	0.03	0.04	0.05	0.07	0.05
CE	0.04	0.06	0.07	0.08	0.06	RE	0.23	0.26	0.20	0.27	0.24
CT	0.07	0.08	0.09	0.06	0.07	RI	0.15	0.14	0.14	0.13	0.14
CZ	0.04	0.04	0.05	0.06	0.05	RM	0.20	0.21	0.20	0.18	0.20
CH	0.13	0.15	0.12	0.15	0.14	RO	0.11	0.16	0.17	0.14	0.15
CO	0.21	0.18	0.19	0.15	0.18	SA	0.08	0.09	0.10	0.08	0.09
CS	0.05	0.05	0.05	0.07	0.05	SS	0.11	0.11	0.09	0.06	0.09
CR	0.13	0.16	0.13	0.14	0.14	SV	0.16	0.20	0.21	0.19	0.19
CN	0.16	0.14	0.15	0.14	0.15	SI	0.13	0.17	0.20	0.14	0.16
EN	0.05	0.03	0.02	0.04	0.03	SR	0.08	0.90	0.11	0.06	0.08
FE	0.14	0.16	0.18	0.17	0.16	SO	0.09	0.13	0.23	0.24	0.17
FI	0.25	0.25	0.25	0.26	0.25	TA	0.08	0.11	0.06	0.07	0.08
FG	0.06	0.05	0.04	0.03	0.05	TE	0.13	0.12	0.10	0.13	0.12
FO	0.17	0.17	0.17	0.15	0.16	TR	0.15	0.19	0.24	0.21	0.20
FR	0.13	0.14	0.14	0.14	0.14	TO	0.24	0.25	0.23	0.22	0.23
GE	0.15	0.18	0.21	0.19	0.18	TP	0.07	0.09	0.08	0.04	0.07
GO	0.23	0.16	0.18	0.19	0.19	TN	0.28	0.24	0.28	0.22	0.25
GR	0.15	0.19	0.14	0.18	0.17	TV	0.18	0.19	0.23	0.17	0.20
IM	0.13	0.17	0.15	0.20	0.16	TS	0.30	0.26	0.28	0.28	0.28
AQ	0.10	0.13	0.12	0.15	0.13	UD	0.29	0.28	0.24	0.24	0.26
SP	0.12	0.15	0.16	0.12	0.14	VA	0.17	0.20	0.19	0.17	0.18
LT	0.16	0.19	0.16	0.16	0.17	VE	0.17	0.19	0.16	0.19	0.18
LE	0.11	0.09	0.07	0.06	0.08	VC	0.22	0.15	0.14	0.18	0.17
LI	0.10	0.16	0.14	0.15	0.14	VR	0.26	0.28	0.22	0.26	0.26
LU	0.18	0.22	0.21	0.15	0.19	VI	0.24	0.24	0.23	0.22	0.23
MC	0.11	0.16	0.06	0.10	0.11	VT	0.10	0.13	0.12	0.18	0.13
MN	0.17	0.13	0.15	0.21	0.16	PN	0.16	0.23	0.20	0.19	0.20
MS	0.18	0.17	0.20	0.13	0.17	IS	0.09	0.14	0.26	0.17	0.16
MT	0.11	0.12	0.13	0.12	0.12	OR	0.03	0.07	0.04	0.05	0.05
ME	0.05	0.07	0.06	0.09	0.07						
						Mean	0.15	0.16	0.16	0.15	0.16

[a] New firms per thousand residents.
Source: Elaborations on INPS and ISTAT.

producer services they account for a small minority of the founders of new firms.

The two series of data computed for the period 1987–90, presented in Tables I and II,[2] show the existence of significant differences between the two indexes. In particular, FER (Table I) is higher for those provinces where the average size of existing firms is smaller[3] (cf. Table A.II in Appendix II for the average size of firms in each province). When BIR (Table II) is used, the ranking is instead significantly different, since in provinces with a more developed industrial structure (in particular those located in the Northern and Central regions of Italy) the overall process of new firm formation captured by this index appears to be stronger than elsewhere. This finding suggests a positive relationship between the dynamics of demand for new producer services functions arising from the industrial sector and the overall start-up and entry process in the producer services sector.

III. Model specification

In order to examine the possible determinants of the process of start-up and entry in the producer services described in the previous section, we estimated the following model for the index of fertility:

$$FER_{it} = \beta_0 + \beta_1 \dot{EMPEF}_{i,t-1} + \beta_2 SFP_{i,t-1} - \beta_3 UTRATE_{i,t-1} - \beta_4 WAGE_{i,t-1} + \beta_5 D_{POLi} + \mu_{it} \quad (1)$$

where $\dot{EMPEF}_i$ is a proxy for sector growth[4] (its expected coefficient is positive) and denotes the annual rate of change of employment in producer services in province i due exclusively to the behaviour of existing firms: net job creations jointly generated by newly established firms and firms that exited during the year are therefore omitted.

SFP_i is a "sector structure" variable which denotes small firm presence measured as the ratio of firms with fewer than 10 employees to the total number of producer services firms located in province i. This variable, too, has a positive expected coefficient, since a positive coefficient of SFP_i denotes that the highest rates of new firm formation are likely to occur in provinces in which the producer services are already dominated by small firms, that is, by the most effective *incubators* of new small enterprises.

$UTRATE_i$ is, for each province, the ratio of utilized credit to the total line of credit. Since an high utilization rate denotes turbulence on the credit market – and a substantial inadequacy of the local supply of bank credit with respect to the requirements of newly and already established firms – the expected coefficient of this variable is negative. In fact, new start-ups of the type considered here are in most cases subject to liquidity constraints. Recourse to bank credit is therefore widespread in all cases where new firms are unable to rely upon the entrepreneur's own funds. As a consequence, the process of new firm formation is likely to be negatively affected by a shortage of bank credit.

$WAGE_i$ stands for the average wages and salaries (per employee) in the producer services in province i and this variable is inserted as a standardized index of labour earnings – i.e., $(WAGE_i - \overline{WAGE})/\sigma_r$. As in Creedy and Johnson (1983) it is assumed in this case that labour earnings have a negative impact upon the index of fertility. In effect, the start-up process captured by the FER index can be described as the choice between dependent job and self-employment widely analysed from both a theoretical and an empirical perspective in a number of previous studies (cf., among others, Storey, 1982; Audretsch and Vivarelli, 1993). When high salaries are available, dependent workers prefer to maintain their position, whereas declining or stagnating salaries may positively affect their decision to start an autonomous entrepreneurial activity.

Finally, D_{POLi} is a dummy variable equal to one in provinces which have benefited from (national) policy intervention aimed at fostering the process of new firm formation by unemployed workers and workers of previously existing enterprises, and zero otherwise.[5]

Conversely, the following model was estimated for the birth index:

$$BIR_{it} = \beta_0 + \beta_1 \dot{EMPEF}_{i,t-1} + \beta_2 SFP_{i,t-1} - \beta_3 UTRATE_{i,t-1} + \beta_4 EMPIND_{i,t-1} + \beta_5 D_{CAPi} + \mu_{it} \quad (2)$$

where $\dot{EMPEF}_i$ is a proxy for sector growth as in equation (1), SFP_i is the index of small firm presence in the producer services employed in

equation (1), and $UTRATE_i$ is the utilization rate also introduced in equation (1).

$EMPIND_i$ is instead the ratio of employment in the industrial sector to the total employment in each province. It is a proxy for the potential demand of producer services arising from the industrial sector. As other studies have shown (cf., for example, Coffey and Polèse, 1986), the growth of industrial concentration results in higher demand for non-standardized and non-industry-specific services usually met by specialized producer services firms.

D_{CAPi} is a dummy variable which is equal to one for the provinces in which the chief towns of each region are located (chief towns which are assumed to "attract" the most innovative among the new firms) and zero otherwise. This dummy variable is employed to test the "filtering down theory" (as developed by Thompson, 1968; Berry, 1973),[6] and the hypothesis of Coffey and Polèse (1989) that high-order producer services activities tend to concentrate within the largest metropolitan areas.

IV. Empirical results

By equations (1) and (2) it was then possible to estimate four annual cross-province regressions, from 1987 to 1990. However, to obtain more efficient estimates, we tested the possibility of working with 380 observations by pooling cross-section and time-series data. Since the hypothesis that both slope coefficients and the intercept of equations (1) and (2) are constant through time was accepted by the F test (cf. Judge *et al.*, 1980), we carried out two sets of regressions by using the pooled ordinary least squares estimator (POLS). Moreover, both specifications turned out to be exempt from heteroskedasticity.

The coefficients estimates, related t-statistics, and tests results are reported in Tables III and IV: in both sets of regressions the coefficients of the independent variables have the expected sign. However, the results from the regressions estimated for the index of fertility are less satisfactory (cf. in particular the lower values of $\bar{R}^2$ and the F ratio) than those obtained with BIR as the dependent variable.

When the dependent variable is FER (Table III), the most significant coefficient among the independent variables is presented by SFP: evidently the incubator effect is the most important determinant of fertility in Italian producer services. Conversely, the utilization rate denotes a significant coefficient only in regression (1.1), whilst

TABLE III
Pooled cross-section, time series regressions for the index of fertility[a]

	1.1	1.2	1.3	1.4
Intercept	−14.494	−12.730	−14.235	−12.560
	(−6.039)	(−5.408)	(−5.895)	(−5.306)
EMPEF	0.046	0.043		
	(2.517)	(2.334)		
SFP	0.216	0.193	0.214	0.192
	(7.915)	(7.283)	(7.785)	(7.201)
UTRATE	−0.016	−0.008	−0.015	−0.007
	(−2.159)	(−1.088)	(−1.976)	(−0.959)
WAGE	−0.197	−0.258	−0.151	−0.213
	(−2.649)	(−3.572)	(−2.086)	(−3.041)
D_{POL}	0.470		0.449	
	(3.038)		(2.889)	
$\bar{R}^2$	0.172	0.154	0.160	0.144
F	16.755	18.236	19.088	22.235

[a] *t*-statistics in brackets.

TABLE IV
Pooled cross-section, time series regressions for the birth index[a]

	2.1	2.2	2.3	2.4
Intercept	−0.305	−0.197	−0.298	−0.185
	(−2.964)	(−1.871)	(−2.892)	(−1.751)
EMPEF	0.002	0.002		
	(2.021)	(2.399)		
SFP	0.006	0.005	0.005	0.005
	(4.843)	(4.069)	(4.753)	(3.938)
UTRATE	−0.003	−0.003	−0.003	−0.003
	(−8.167)	(−9.285)	(−8.052)	(−9.165)
WAGE	0.003	0.003	0.003	0.003
	(9.322)	(7.932)	(9.846)	(8.437)
D_{POL}	0.041		0.042	
	(5.734)		(5.895)	
$\bar{R}^2$	0.453	0.406	0.448	0.399
F	63.682	65.788	77.940	84.728

[a] *t*-statistics in brackets.

when EMPEF and D_{POL} are alternatively or jointly excluded (regressions 1.2, 1.3, 1.4) the coefficient of UTRATE is not significant. Interestingly, the positive and highly significant coefficient of SFP is coupled with a barely (in equation 1.1) or not significant coefficient of UTRATE: this means that provinces with the strongest presence of small firms are the most effective in terms of rates of fertility, irrespective of the conditions which prevail on the credit market.

Conversely, in the regressions carried out for BIR the proxy for the potential demand of producer services arising from the industrial sector (EMPIND) and the UTRATE variable obtain the highest significant coefficients. This result shows that not only is entry in Italian producer services affected by the potential demand for new services but it also depends upon the availability of credit financing. In effect, self-financing alone presumably does not guarantee full coverage of the start-up and entry costs faced by the most innovative among the new firms which – as confirmed by the significant coefficient of the dummy variable used to test the filtering down hypothesis and the assumption that higher-order services are located mainly in metropolitan areas – represent a large portion of those captured by the BIR index. Moreover, the regressions in which D_{CAP} is inserted (2.1 and 2.4) are those with the highest values of the coefficient of determination adjusted for the degrees of freedom.

V. Concluding remarks

The simple POLS regressions estimated in this paper confirm that the choice of the index of new firm formation is very important in identifying the various features of this phenomenon. In the case of producer services in Italy, it emerges that the share of new enterprises on employees of existing firms (rate of fertility) is a good proxy for the ability of small firms to provide their employees with the skills required to start a new business. Conversely, the ratio between new enterprises and resident population (birth rate) represents for each province a reliable figure of the overall process of new firm formation.

A careful analysis of the factors which affect these two measures of new firm formation allows one to make some preliminary suggestions on policies able to foster the process of firm entry and growth in the producer services. In particular, the rate of fertility could be positively affected by policies encouraging self-employment, and by the provision of financial and non-financial incentives to those individuals who decide to start their own business in the same sector in which they were previously employed. In turn, the overall process of new firm formation in the producer services would benefit greatly from a national innovation policy aimed at strengthening the diffusion and use of new, higher-order producer services functions among industrial firms.

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Notes

[1] This index is consistent also with the idea that under certain circumstances to start a new business can be a way to escape from unemployment (cf. Storey and Jones, 1987).

[2] For a list of the acronyms used to denote each province, cf. Appendix 1.

[3] In this case, according to Johnson and Cathcart (1979), small firms may be assumed as "incubators" where employees more easily learn the skills needed to start a new business than employees of larger firms.

[4] In empirical studies of start-up and entry an index of sector growth is usually inserted (cf., among others, Acs and Audretsch, 1989; Cotterill and Haller, 1992).

[5] In particular, this dummy variable takes into consideration those provinces which benefited from Law 44 of 1986, intended to promote the creation of new firms.

[6] This theory relies upon the hypothesis that metropolitan areas (and, in general, the most advanced areas within each region) experience the highest rate of birth for innovative firms.

Appendix I

TABLE A.I
Italian provinces by geographical area and corresponding acronym[a]

North-Western Provinces:
AO = Aosta (**Valle d'Aosta**)
AL = Alessandria; **AT** = Asti; **CN** = Cuneo; **NO** = Novara; **TO** = Torino; **VC** = Vercelli (**Piemonte**)
BG = Bergamo; **BS** = Brescia; **CO** = Como; **CR** = Cremona; **MI** = Milano; **MN** = Mantova; **PV** = Pavia; **SO** = Sondrio; **VA** = Varese (**Lombardia**)
GE = Genova; **IM** = Imperia; **SA** = Savona; **SP** = La Spezia (**Liguria**).

North-Eastern and Central Provinces:
BZ = Bolzano; **TN** = Trento (**Trentino – Alto Adige**)
GO = Gorizia; **PN** = Pordenone; **TS** = Trieste; **UD** = Udine (**Friuli Venezia – Giulia**)
BL = Belluno; **PD** = Padova; **RO** = Rovigo; **VE** = Venezia; **VR** = Verona; **VI** = Vicenza (**Veneto**)
BO = Bologna; **FE** = Ferrara; **FO** = Forlì; **MO** = Modena; **PR** = Parma; **PC** = Piacenza; **RA** = Ravenna; **RE** = Reggio Emilia (**Emilia – Romagna**)
AR = Arezzo; **FI** = Firenze; **GR** = Grosseto; **LU** = Lucca; **LI** = Livorno; **MS** = Massa – Carrara; **PI** = Pisa; **PT** = Pistoia; **SI** = Siena (**Toscana**)
AN = Ancona; **AP** = Ascoli Piceno; **MC** = Macerata; **PS** = Pesaro – Urbino (**Marche**)
PG = Perugia; **TR** = Terni (**Umbria**)
FR = Frosinone; **LT** = Latina; **RI** = Rieti; **RM** = Roma; **VT** = Viterbo (**Lazio**).

Southern Provinces
AQ = L'Aquila; **CH** = Chieti; **PE** = Pescara; **TE** = Teramo (**Abruzzo**)
CB = Campobasso; **IS** = Isernia (**Molise**)
AV = Avellino; **BN** = Benevento; **CE** = Caserta; **NA** = Napoli; **SA** = Salerno (**Campania**)
MT = Matera; **PZ** = Potenza (**Basilicata**)
BA = Bari; **BR** = Brindisi; **FG** = Foggia; **LE** = Lecce; **TA** = Taranto (**Puglia**)
CZ = Catanzaro; **CS** = Cosenza; **RC** = Reggio Calabria (**Calabria**)
AG = Agrigento; **CL** = Caltanissetta; **CT** = Catania; **EN** = Enna; **ME** = Messina; **PA** = Palermo; **RG** = Ragusa; **SR** = Siracusa; **TP** = Trapani (**Sicilia**)
CA = Cagliari; **NU** = Nuoro; **OR** = Oristano; **SS** = Sassari (**Sardegna**).

[a] Regions including each sub-group of provinces are reported in brackets.

Appendix II

TABLE A.II
Mean size of existing, new and exited firms in Italian producer services (1987–90)

	Existing	New	Exited		Existing	New	Exited
AG	3.15	1.72	2.38	MI	5.64	3.07	2.73
AL	2.76	2.28	1.89	MO	3.63	1.92	1.89
AN	3.50	2.54	1.78	NA	5.29	2.87	1.89
AO	3.26	2.25	2.73	NO	3.07	1.88	2.11
AR	3.50	1.43	1.65	NU	3.40	2.68	4.16
AP	2.88	1.82	1.75	PD	4.43	1.92	2.46
AT	3.37	2.66	2.37	PA	8.23	2.15	2.09
AV	3.35	1.99	2.20	PR	3.55	2.11	2.11
BA	4.27	2.58	2.53	PV	2.99	2.11	2.29
BL	2.71	1.69	1.81	PG	3.19	2.20	2.29
BN	2.66	2.01	1.94	PS	2.74	1.88	1.70
BG	3.52	1.91	2.06	PE	3.23	1.66	1.37
BO	3.48	2.40	2.42	PC	2.72	1.54	1.79
BZ	3.00	1.60	1.69	PI	3.02	1.99	1.94
BS	3.09	1.91	1.99	PT	3.24	1.80	1.62
BR	3.96	2.45	5.15	PZ	5.10	2.82	2.90
CA	4.21	2.53	2.93	RG	3.47	2.04	2.41
CL	3.04	1.74	2.02	RA	3.84	2.30	2.16
CB	3.35	2.02	1.47	RC	3.49	1.81	2.17
CE	5.29	2.52	2.19	RE	3.48	2.50	2.80
CT	4.39	2.83	3.66	RI	2.47	1.52	1.60
CZ	4.12	2.85	2.15	RM	5.95	2.55	2.67
CH	3.15	2.45	2.32	RO	2.78	1.39	1.68
CO	3.11	1.88	1.89	SA	3.35	2.43	1.84
CS	4.70	2.81	4.63	SS	4.24	2.02	2.09
CR	4.05	1.68	1.92	SV	2.98	1.83	1.98
CN	2.78	1.86	1.65	SI	3.35	1.91	1.73
EN	6.95	2.58	1.46	SR	3.60	2.14	3.81
FE	2.84	2.12	1.83	SO	3.10	1.80	1.82
FI	3.04	1.99	2.27	TA	3.48	2.40	2.67
FG	4.71	3.46	5.73	TE	2.93	2.26	2.02
FO	3.02	2.17	2.09	TR	2.57	1.65	1.48
FR	4.78	2.28	2.85	TO	5.45	2.20	3.32
GE	3.27	1.74	2.37	TP	3.26	2.02	2.48
GO	2.76	2.92	1.44	TN	3.06	1.72	1.84
GR	3.19	2.05	2.30	TV	2.99	2.15	2.08
IM	2.72	1.92	1.63	TS	4.41	2.17	2.61
AQ	3.23	3.18	2.20	UD	2.58	1.64	1.66
SP	3.36	1.72	2.34	VA	3.19	1.85	1.98
LT	3.38	2.19	2.01	VE	3.33	2.18	2.11
LE	3.05	1.66	1.85	VC	3.23	1.70	2.43
LI	3.42	3.00	3.66	VR	3.05	1.70	1.87
LU	2.86	1.71	1.67	VI	3.38	1.72	2.67
MC	3.23	3.49	1.93	VT	4.10	4.66	5.03
MN	2.83	2.15	1.88	PN	3.08	1.53	1.77
MS	2.93	1.80	1.88	IS	3.08	2.07	1.38
MT	3.98	3.35	3.19	OR	4.01	2.74	1.80
ME	3.90	1.77	2.83				
				MEAN	4.11	2.28	2.39

Source: Elaborations on the INPS file.

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