Testing Gribat´s Law Across Regions. Evidence from Spain.

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Abstract

The article analyses if Gibrat's law holds in different regions of Spain using a sample of Spanish manufacturing firms over the period 1990-2001. The regions are classified depending on the degree of development of the provinces included. The study draws upon a sample of 1073 manufacturing firms in which only 751 of them survived for the whole twelve years period. The analyses test Gibrat's law by using the procedure proposed by Heckman, in which a probit survival equation is first estimated to correct for sample selection bias, estimating the model by maximum likelihood methods. The results reject Gibrat's law for the most developed Spanish regions, supporting the proposition that small firms have grown faster, but accepts it for non developed areas. Additionally, the results show that innovating activity – both process and product – is a strong positive factor in firm's survival, independently of the region firm is located.

Journal of Economic Literature classification: L11; L25.

Introduction.

The relevance of the role played by firms of different size, and specially for small firms, in job creation, has developped an extensive international literature, above all after Birch'statement that "SMEs provide the highest share of economic employment"[1]. One of the usual ways of testing if SMEs experience a higher increase in employment is to test Gibrat's law of "proportionate growth", which states that "the probability of a given proportionate change in size during a specified period is the same for all firms in a given industry regardless of their size at the beginning of the period". Many authors have tested this law, and interesting surveys on this matter are found in Wagner, 1992; Geroski, 1995; Sutton, 1997; or Caves, 1998, among others.

The studies testing Gibrat´s law have incorporated different variables, adding relevant information on the characteristics associated with employment growth, such as the *innovating activity*, under the assumption that innovators experience a higher increase in employment (Licht and Nerlinger, 1998; Storey and Tether, 1998; Almus and Nerlinger, 1999 and 2000; or Freel, 2000); the *age* of the firm testing if the youngest grow bigger (Reid, 1995; Harhoff et al, 1998, Heshmati, 2000, in an explicit way, or Almus and Nerlinger, 2000 and Audretsch et al, 1999 in an implicit one); *industrial technological development*, under the hypothesis that bigger growth occurs in more technologically developed industries (Almus and Nerlinger, 1999 and 2000, Harhoff et al, 1990, Audretsch, 1995, Audretsch et al, 1999, or Freel, 2000); and *legal liability* (Harhoff et al, 1998 or Almus y Nerlinger, 1999), testing if firms with owner's limited legal liability create more jobs. All those variables have been included for the Spanish case in Calvo,2002.

Nevertheless, any of those studies mentioned before have not included geographical aspects, a variable that could be expected to have some relevance in this type of analysis. In fact, the first study that takes into account geographical variables for testing Gibrat´s law is Wiseen and Huisman, 2003, who differentiate between urban and not urban areas in five regions in the Netherlands. The reason to justify the inclusion of those characteristics is related to *agglomeration effects*.

[1] Birch, 1979.

Agglommeration effects support Gibrat's law rejection in urban areas, where small firms will grow faster and, at the same time, the law's fulfillment in not urban areas, at least for large firms. The reasons argued by the authors mentioned are related to technological innovation and R&D activities in small firms; the presence of new products in or around the larger urban centres produced by small firms; the existence of higher incomes and consumer demand directed towards specializad products in urban areas, where small firms are concentrated; a higher firm turnover for young and small firms in urban regions; and congestions and limited availability of space, creating barriers for larger firms to grow[2].

The present study test Gibrat's law using Spanish data taking into account regional differences. The data come from the *Firms Strategic Behaviour Survey* for the period 1990-2001. A sample of 1073 firms is used: 751 of them survive for the whole period, and, consequently, 322 disappear at some time over the 12 year period. At the same time, four different regions are considered, depending on the size of the Spanish provinces included in each group. A typical Gibrat's equation is estimated, where the employment of the last period depends on the employment of the first period and the rest of variables (innovation, age, legal liability, and technological development of the sector). Because of sample attrition, we use the procedure proposed by Heckman, 1979, and estimate by maximum likelihood methods the model, including a probit survival equation.

The structure of the study is as follows: the first section presents the data; the second section defines the model used; the third section shows the estimated results; finally, the last section develops the main conclusions.

The data.

The data used in this article come from the *Firms Strategic Behaviour Survey (ESEE)*. This is a survey of Spanish manufacturing firms that began in 1990 and is conducted

[2] See Wiseen and Huisman, 2003 for a complete survey on those effects.

annually for about 2000 firms. It includes a very complete questionnaire about each firm's strategic decisions, producing good insight into the Spanish manufacturing industry[3].

The ESEE began in 1990 with 2188 firms, but we only have useful information for 1073. From those, 751 have full information for the whole period of analysis, survived from 1990 to 2001, and 322 can be considered as firms that have exited the market (closed) during the period. The rest did not respond to the survey anymore, fused with other firms, or divided into multiple firms.

Firms in the sample are small in size (Table I). Though the mean of the sample could be considered as relatively high, 266 employed people for the whole sample, 332 for the firms that survive and 111,3 for those that disappeared, the mode and the 25th and 50th percentiles are quite small for the three samples. As it could be expected, the skewness coefficient confirms that the sample is very right asymmetric: most of the firms are very small, and only a few have a large number of employees.

As we mentioned in the last paragraph, there are big differences in size between those firms that survived and those that did not: the mean size of the surviving firms is three times that of those that closed. This difference is corroborated by comparing the size of the firms at various percentiles of the distribution, especially at the 75th percentile (the 25 percent of the firms with the largest number of employees). Consequently, it is reasonable to suppose that selection bias should play an important role in the estimated results.

On the contrary, the differences between surviving and disappearing firms for the age variable[4] are not significant.

Other aspects related to the data are shown in Table II, where we can see the distribution of the sample for some dummy variables employed in the study. So, limited legal liability characterizes both samples (more than 70% of them); low technological development is a predominate characteristic of those firms that closed;

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[3] The questionnaire and general results of ESEE can be found in www.funep.es/PIE/ESEE/esee1.htm.
[4] The variable definitions are included in the Appendix.

and the firms that survive are largely innovators, while non-innovators dominate those firms that have closed. Therefore, it could be suspected that these variables should have some influence in the survival equation.

The main characteristic considered in this study is geographical distribution. Firms have been classified in four different groups depending on technological degree of development of the region they are located. The distribution of the sample and ANOVA analysis of its main characteristics depending on this geographical classification are included in Tables III and IV[5].

Table III show that firms behave differently depending on the region: those located in provinces 2 and 4 have a higher rate of survival, specially comparing to the most developed region. In Madrid and Barcelona (province 1) almost half of the firms have disappeared during the 12 year period. On the contrary, more than 86% of province 2 firms survive.

The ANOVA analysis of Table IV shows significant differences in process innovation and sector's technological development depending on province's classification for the whole sample and surviving firms, but those differences disappear for the sample of firms that close. Employment, age, legal liability and product innovation are not significantly different for any sample.

The model

In order to test Gibrat's law we use a typical equation in which employment in the last period (2001) is dependent on employment of the first period (1990) and the rest of variables. The equation is:

[5] The distribution of the variables in the sample depending on location characteristics are included in the Appendix. Tables A1 and A2

$$\log S_{i01} = \beta_0 + \beta_1 \log S_{i90} + \beta_2 \log(age) + \beta_3 \log S_{i90} * \log(age) + \beta_4 RESJUR + \beta_5 INNPRO + \beta_6 INPRC + \beta_7 TECHIGH + \beta_8 TECMED + \varepsilon_{i00} \qquad (1)$$

where S_{i01} is the employment of the i_{th} firm in 2001; S_{i90} is the employment of the same firm in 1990, and the other variables are defined in the Appendix.

Gibrat's law holds if β_1 is not significantly different from 1. Small firms have grown more if β_1 is less than 1, and big firms will have grown more if β_1 it is greater than 1. On the other hand, β_2 will be negative if young firms have experienced a bigger growth during the period; β_3 is an interaction coefficient between age and size, and its value is not determined; β_4 will be positive if firms with limited legal liability have grown larger; and the remaining parameters – β_5, β_6, β_7 and β_8 – will all be positive if the growth has been larger among innovating firms of product or process, firms in high technological sectors, or firms in sectors with medium technological development, respectively.

The estimation of the β's by least squares with existing firms in 2001 runs the risk of bias arising from sample attrition. The appropriate econometric method to resolve this problem is the two-step method suggested by Heckman, 1979. This requires the introduction of an additional explanatory variable in the least squares regression – the inverse Mill's Ratio – obtained from a probit model on firm survival in the least squares regression for surviving firms. The probit equation we use is:

$$SUPERV = \varphi_0 + \varphi_1 \log S_{i90} + \varphi_2 \log(age) + \varphi_3 \log S_{i90} * \log(age) + \varphi_4 RESJUR + \varphi_5 INNPRO + \varphi_6 INPRC + \varphi_7 TECHIGH + \varphi_8 TECMED + \mu_{i00} \qquad (2)$$

where SUPERV is 1 if the firm has survived until 2001, and 0 if it has closed.

Although this Heckman estimator is consistent, it is not fully efficient. Efficient estimates can be obtained by applying an iterative procedure that uses the estimates from the Heckman procedure as starting values and will lead, on convergence, to maximum likelihood estimates (Maddala, 1983, Weiss, 1998).

Therefore, in order to test Gibrat's law we jointly estimate equations (1) and (2) by Heckman procedure using maximum likelihood methods. The set of estimators is reported in the next section.

Results of the estimation

The results of the estimated models are reported in Table V: columns 2 to 5 show the estimators for the four groups the sample is divided, meanwhile column 6 includes the whole sample estimations.

Gribrat's law holds for the whole sample and for developped regions, as can be seen in columns 1 and 2 and the test for β_1. On the contrary, in less developped provinces the test rejects the law and in provinces of group 3 the growth is higher for big firms.

Another important conclusions can be obtained from Table V: the likelihood test shows that the equations are not independent in any of the groups, what means that a least square estimation with the survival sample would be biased. In fact, the significance of parameters Sigma and Rho in the estimation shows that we have to take into account an important bias introduced by the existence of firms that disappeared over the period of analysis. The second additional conclusion is that innovation, both process or product, is the main characteristic to explain survival of firms, independently of the region they are located. Only in the less developed provinces product innovation has no effect.

Conclusions

Gibrat's law test for different regions in Spain, classified depending on the degree of technological development of the region, has show an heterogynous behaviour: small firms located in the most developed areas of Spain, concretely Madrid and Barcelona, have grown higher than big firms; on the contrary, in less developed regions Gibrat's law is rejected and even big firms have grown higher in group 3 provinces, since the estimator of the employment variable is bigger than 1. This results support the agglomeration effects discussed in the first section.

Another two conclusions can be extracted from the estimation: firstly, the right election of the method used to correct from sample attrition, Heckman's methodology, since the test for independence of the equations has shown they are related, independently of the regions considered; secondly, innovation, process or product, is the key factor for firm survival over the years considered. The rest of the variables are not significant.

Table I.- *Principal values of the sample. Employment and age of firms in 1990.*

	Employment			**Age**		
	All firms	**Survived**	**Disappeared**	**All firms**	**Survived**	**Disappeared**
Mean	265.7	331.9	111.26	21.67	22.72	19.23
Median	36.0	48.0	26.0	15.0	17.0	11.0
Mode	12.0	13.0	12.0	4.0	4.0	5.0
Percentile 25	18.0	20.0	16.0	6.0	7.0	5.0
Percentile 50	36.0	48.0	26.0	15.0	17.0	11.0
Percentile 75	249.5	284.0	104.25	28.0	30.0	25.25
Skewness	13.9	11.8	3.4	2.0	1.8	2.4
Nº observations	1073	751	322	1073	751	322

Source: Drawn up by author.

Table II.- *Distribution of the total sample*[6].

		All firms		**Survived**		**Disappeared**	
		Nº	**%**	**Nº**	**%**	**Nº**	**%**
Liability	*Limited*	809	75.4	579	77.1	230	71.4
	Not limited	264	24.6	172	22.9	92	28.6
Sector's Technical	*High*	234	21.8	177	23.5	57	17.7
Development	*Medium*	347	32.3	258	34.5	89	27.6
	Low	492	45.9	316	42.1	176	54.7
Innovation of	*Innovative*	631	58.8	524	69.8	107	33.2
Product	*Non Innovative*	442	41.2	227	30.2	215	66.8
Innovation of	*Innovative*	767	71.5	643	85.6	124	38.5
Process	*Non innovative*	306	28.5	108	14.4	198	61.5

Source: Drawn up by author.

[6] The definition of variables is included in the Appendix.

Table III.- *Distribution of the sample depending on firm´s surviving behaviour and Province´s classification.*

	All firms		Survived			Disappeared		
	Nº	%	Nº	%	% surv.	Nº	%	% disap.
PROVINCE 1	369	34,4	202	54,7	26,9	167	45,3	51,9
PROVINCE 2	271	25,3	234	86,3	31,2	37	13,7	11,5
PROVINCE 3	276	25,7	188	68,1	25,0	88	31,9	27,3
PROVINCE 4	157	14,6	127	80,9	16,9	30	19,1	9,3

Table IV.- *ANOVA of the variables depending on province´s classification.*

	All firms		Survived		Disappeared	
	F statistics	Sign.	F statistics	Sign	F statistics	Sign
Employment 1990	0.353	0.787	0.722	0.539	0.306	0.821
Age	1.853	0.136	2.542	0.055	2.244	0.083
Liability	0.068	0.977	1.287	0.278	1.280	0.281
Sector's Technical Development	5.354	0.001	8.712	0.000	0.307	0.820
Innovation of Product	1.306	0.271	1.279	0.281	0.898	0.442
Innovation of Process	7.565	0.000	4.395	0.004	1.241	0.295

Source: Drawn up by author.

Table V.- *Estimation Results.*

	PROV1	**PROV2**	**PROV3**	**PROV4**	**ALL**
Gibrat's equation					
Constant	0.3261	0.7832**	0.4407	0.9593*	0.6870*
	(0.45)	(2.38)	(0.85)	(1.72)	(1.88)
Log S_{i90}	0.7763***	0.8294***	1.0443***	0.8279***	0.8227***
	(9.10)	(12.21)	(7.90)	(6.93)	(18.54)
Log Age	-0.2408	-0.1434	-0.0362	-0.2492	-0.2015***
	(1.64)	(1.22)	(0.21)	(1.30)	(2.76)
Log S_{i90}*LogAge	0.0314	0.0129	-0.0300	0.0280	0.0230
	(1.13)	(0.55)	(0.73)	(0.73)	(1.58)
RESJUR	0.1290	0.1087	-0.0369	0.0153	0.0293
	(1.12)	(1.23)	(0.29)	(0.11)	(0.51)
INNPRO	0.1059	0.0718	-0.1800	-0.1060	0.0282
	(0.98)	(0.87)	(1.60)	(0.91)	(0.41)
INNPRC	0.6739**	0.1594	0.0396	0.1512	0.2913*
	(2.25)	(1.38)	(0.27)	(0.95)	(1.82)
TECHIGH	0.1052	0.0095	0.2401*	0.2033	0.1216**
	(0.94)	(0.10)	(1.73)	(1.54)	(2.23)
TECMED	0.0232	-0.0795	0.0897	0.0531	0.0332
	(0.22)	(1.01)	(0.87)	(0.41)	(0.66)
Select equation					
Constant	-2.6387***	0.5591	0.2452	-1.1065	-0.9764
	(3.86)	(0.56)	(0.27)	(0.75)	(2.41)
Log S_{i90}	0.1933	-0.3806*	-0.1001	0.4515	0.0642
	(1.24)	(1.67)	(0.43)	(1.12)	(0.66)
Log Age	0.3290	-0.2314	-0.1675	0.2118	0.1468
	(1.34)	(0.52)	(0.50)	(0.44)	(0.97)
Log S_{i90}*LogAge	-0.0436	0.1310	0.0584	-0.0859	-0.0096
	(0.84)	(1.37)	(0.74)	(0.73)	(0.29)
RESJUR	0.1742	0.2645	-0.6824***	-0.4030	-0.1717
	(0.90)	(1.04)	(2.94)	(1.25)	(1.54)
INNPRO	0.3409**	0.7145***	0.6748***	0.4191	0.4817***
	(1.99)	(2.96)	(3.53)	(1.47)	(4.92)
INNPRC	1.5431***	0.8334***	1.1887***	0.7157**	1.146***
	(5.21)	(3.30)	(6.07)	(2.33)	(11.36)
TECHIGH	0.3311*	0.3620	-0.4392*	0.1086	0.0637
	(1.68)	(1.09)	(1.70)	(0.33)	(0.52)
TECMED	0.2771	0.2172	-0.1262	0.7600**	0.1733
	(1.55)	(0.86)	(0.61)	(2.07)	(1.65)
Rho	0.4813	-0.6357	-0.6175	-0.1693	0.0597
Sigma	0.6046	0.5192	0.6373	0.5460	0.5552
Lambda	0.2910	-0.3300	-0.3935	-0.0924	0.0332
Log likelihood	-350.577	-249.983	-296.455	-167.004	-1140.677
LR test$^{(1)}$	0.25	1.20	1.33	0.14	0.02
Test for $\beta_1 = 1^{(2)}$	6.88***	6.31**	0.11	2.08	15.96***
Nº observations	369	271	276	157	1073
Censored	167	37	88	30	322
Uncensored	202	234	188	127	751

**** Significant at 99%; ** Significant atl 95%; * Significant at 90%..*
t- values in parentheses.

(1) *LR test of independent equations (rho=0). Chi-square(1).*
(2) *Chi-square (1)*

APPENDIX.

AGE.- Age of the firm, measured as the difference between its creation year and 1990.

RESJUR.- Legal liability. It takes the value 1 if it is limited (Anonymous Societies) and 0 otherwise (Individual Property; Limited Societies; Cooperatives; others).

INNPRO.- Product innovation. It takes the value 1 if it is a product innovating firm and 0 otherwise. A firm is defined as a product innovator if *"in any of the years along the period an innovation of product has been introduced"*.

INNPRC.- Process innovation. It takes the value 1 if it is a process innovating firm and 0 otherwise. A firm is defined as a process innovator if *"in any of the years along the period an innovation of process has been introduced"*.

TECHIGH; TECMD; TECLOW.- Sector's technological development. Sectors are classified as:

TECHIGH.- It takes the value 1 if the firm belongs to one of these sectors:
Chemical products.
Office and computing machinery
Electrical and electronic machinery
Motor vehicles
Other transport equipment

TECMED.- It takes the value 1 if the firm belongs to one of these sectors:
Basic metals
Non-metallic mineral products
Metal products
Machinery and mechanical equipment
Rubber and plastics
Other manufacturing industries

TECLOW.- It takes the value 1 if the firm belongs to one of these sectors:
Food, beverages and tobacco
Textiles
Leather
Footwear, wearing apparel and other clothing
Wood and cork
Paper, graphic arts and publishing

PROV1, PROV2,PROV3, PROV4.- Provinces are classified as follows:

PROV1.- Barcelona, Madrid.

PROV2.- Álava, La Coruña, Guipúzcoa, Navarra, Sevilla, Valencia, Valladolid, Vizcaya, Zaragoza.

PROV3.- Alicante, Baleares, Burgos, Castellón, Córdoba, Gerona, Granada, Guadalajara, Lérida, La Rioja, Málaga, Murcia, Orense, Segovia, Tarragona, Toledo.

PROV4.- Albacete, Almería, Badajoz, Cáceres, Cádiz, Ciudad Real, Cuenca, Huelva, Huesca, Jaén, León, Lugo, Asturias, Palencia, Las Palmas, Pontevedra, Salamanca, Tenerife, Cantabria, Soria, Teruel, Zamora.

REFERENCES.

ALMUS, M. & E. NERLINGER, 1999: "Growth of New Technology-Based Firms: Which Factors Matter?", *Small Business Economics*, vol. 13, 141-154.

ALMUS, M. & E. NERLINGER, 2000: "Testing Gibrat´s Law for Young Firms – Empirical Results for West Germany", *Small Business Economics*, vol. 15, 1-12.

AUDRETSCH, D., 1995: "Innovation, Growth and Survival", *International Journal of Industrial Organization*, **13**, 441-457.

AUDRETSCH, D. ;E. SANTARELLI; M. VIVARELLI, 1999: "Start-up Size and Industrial Dynamics: Some Evidence from Italian Manufacturing", *International Journal of Industrial Organization*, **17**, 965-983.

BIRCH, D. L., 1979: *The Job Generation Process*. MIT Program on Neighbourhood and Regional Change, Cambridge.

CALVO, J., 2002: "Testing Gibrat's Law for Small, Young and Innovating Firms. Some Empirical Results for Spain". Mimeo.

CAVES, R. E., 1998: "Industrial Organization and New Findings on the Turnover and Mobility of Firms", *Journal of Economic Literature*, **36**, 1947-1982.

FREEL, M.S., 2000: "Do Small Innovating Firms Outperform Non-Innovators?", *Small Business Economics*, **14**, 195-210.

GEROSKI, P.A., 1995: "What Do We Know about Entry?", *International Journal of Industrial Organization*, **13**, 421-440.

HARHOFF, D.; K. STAHL; M. WOYWODE, 1998: "Legal Form, Growth and Exit for West German Firms- Results for Manufacturing, Construction, Trade and Service Industries", *The Journal of Industrial Economics*, **XLVI,** 453-488.

HESHMATI, A., 2001: "On the Growth of Micro and Small Firms: Evidence from Sweden", *Small Business Economics*, **17**, 213-228.

HEKCMAN, J., 1979: "Sample Selection Bias as a Specification Error", *Econometrica* **47**, 153-161.

IMPI, 1994: *Informe Anual de la Pequeña y Mediana Empresa en España 1993*. Instituto de la Pequeña y Mediana Empresa Industrial. Madrid.

IMPI, 1995: *Informe Anual de la Pequeña y Mediana Empresa en España 1994*. Instituto de la Pequeña y Mediana Empresa Industrial. Madrid.

LICHT, G. & E. NERLINGER, 1998: "New Technology-Based Firms in Germany: A Survey of the Recent Evidence", *Research Policy*, **26**, 1005-1022.

MADDALA, G.S., 1983: *Limited Dependent and Qualitative Variables in Econometrics*, Cambridge. Cambridge University Press.

REID, G.C., 1992: “Early Life Cycle Behaviour of Micro-Firms in Scotland”, *Small Business Economics*, **7**, 89-95.

STOREY D.B. & B. TETHER, 1998: “New Technology-Based Firms in the European Union: An Introduction”, *Research Policy*, **26**, 933-1026.

SUTTON, J., 1997: “Gibrats Legacy”, *Journal of Economic Literature*, **35**, 40-59.

WAGNER, J. 1992: “Firm Size, Firm Growth, and Persistence of Chace: Testing Gibrat’s Law with Establishments Data from Lower Saxony, 1978-1989”, *Journal of Small Business Economics*, **4**, 125-131.

WEISS, C.R. 1998: “Size, Growth, and Survival in the Upper Austrian Farm Sector”, *Small Business Economics*, **10**, 305-312.

WISSEN, L. & HUISMAN, C., 2003: “Firm Growth across Regions. A Regional Test of Gibrat’s Law”, paper prepared for the 43th ERSA conference. Jyväskylä, Finland.

Table A1.- *Principal values of the sample depending on Province´s classification. Employment and age of firms in 1990.*

	Employment			Age		
	All firms	**Survived**	**Disappeared**	**All firms**	**Survived**	**Disappeared**
PROVINCE 1						
Mean	275.8	405.8	118.5	23.6	25.9	20.8
Median	36.0	100.5	24.0	16.0	19.0	11.0
Mode	11.0	11.0	12.0	5.0	4.0	5.0
Percentile 25	18.0	21.0	15.0	6.0	9.0	5.0
Percentile 50	36.0	100.5	24.0	16.0	19.0	11.0
Percentile 75	279.5	362.25	117.0	30.5	36.0	27.0
Skewness	15.4	11.7	3.2	1.7	1.4	2.1
Nº observations	369	202	167	369	202	167
PROVINCE 2						
Mean	278.0	307.2	93.7	21.2	22.6	12.08
Median	42.0	46.0	26.0	16.0	17.5	8.0
Mode	11.0	11.0	16.0	4.0	4.0	8.0
Percentile 25	18.0	18.75	17.0	6.0	6.0	5.0
Percentile 50	42.0	46.0	26.0	16.0	17.5	8.0
Percentile 75	267.0	300.25	90.0	31.0	32.25	16.5
	5.1	4.8	3.5	1.7	1.6	1.4
Nº observations	271	234	37	271	234	37
PROVINCE 3						
Mean	285.2	365.8	113.1	19.6	20.6	17.6
Median	35.0	38.5	29.5	14.5	17.0	11.0
Mode	13.0	13.0	12.0	3.0	4.0	3.0
Percentile 25	18.0	19.0	17.0	6.25	8.0	5.0
Percentile 50	35.0	38.5	29.5	14.5	17.0	11.0
Percentile 75	171.75	201.0	135.75	25.75	27.0	20.5
	9.9	8.2	3.7	2.3	2.0	2.8
Nº observations	276	188	88	276	188	88
PROVINCE 4						
Mean	186.4	209.8	87.1	21.6	20.9	24.4
Median	33.0	35.0	29.5	14.0	15.0	13.0
Mode	10.0	13.0	10.0	8.0	8.0	9.0
Percentile 25	19.0	20.0	12.0	7.0	7.0	6.8
Percentile 50	33.0	35.0	29.5	14.0	15.0	13.0
Percentile 75	256.0	284.0	78.3	27.0	27.0	32.5

	3.5	3.3	3.9	2.6	2.9	2.0
Nº observations	157	127	30	157	127	30

Source: Drawn up by author.

Table A2.- *Distribution of the sample depending on Province´s classification.*

		All firms		Survived		Disappeared	
		Nº	**%**	**Nº**	**%**	**Nº**	**%**
		PROVINCE 1					
Liability	*Limited*	281	76.2	164	81.2	117	70.1
	Not limited	88	23.8	38	18.8	50	29.9
Sector's Technical	*High*	92	24.9	62	30.6	30	18.0
Development	*Medium*	118	32.0	70	34.7	48	28.7
	Low	159	43.1	70	34.7	89	53.3
Innovation of	*Innovative*	213	57.7	151	74.8	62	37.1
Product	*Non Innovative*	156	42.3	51	25.2	105	62.9
Innovation of	*Innovative*	249	67.5	186	92.1	63	37.7
Process	*Non innovative*	120	32.5	16	7.9	104	62.3
PROVINCE 2							
Liability	*Limited*	204	75.3	181	77.4	23	62.2
	Not limited	67	24.7	53	22.6	14	37.8
Sector's Technical	*High*	64	23.6	59	25.2	5	13.5
Development	*Medium*	102	37.6	91	38.9	11	29.7
	Low	105	38.7	84	35.9	21	56.8
Innovation of	*Innovative*	172	63.5	162	69.2	10	27.0
Product	*Non Innovative*	99	36.5	72	30.8	27	73.0
Innovation of	*Innovative*	219	80.8	202	86.3	17	45.9
Process	*Non innovative*	52	19.2	32	13.7	20	54.1
PROVINCE 3							
Liability	*Limited*	206	74.6	137	72.9	69	78.4
	Not limited	70	25.4	51	27.1	19	21.6
Sector's Technical	*High*	43	15.6	27	14.4	16	18.2
Development	*Medium*	82	29.7	56	29.8	26	29.5
	Low	151	54.7	105	55.8	46	52.3
Innovation of	*Innovative*	153	55.4	128	68.1	25	28.4
Product	*Non Innovative*	123	44.6	60	31.9	63	71.6
Innovation of	*Innovative*	179	64.9	150	79.8	29	33.0
Process	*Non innovative*	97	35.1	38	20.0	59	67.0
PROVINCE 4							
Liability	*Limited*	118	75.2	97	76.4	21	70.0
	Not limited	39	24.8	30	23.6	9	30.0
Sector's Technical	*High*	35	22.3	29	22.8	6	20.0
Development	*Medium*	45	28.7	41	32.3	4	13.3
	Low	77	49.0	57	44.9	20	66.7
	Innovative	93	59.2	83	65.4	10	33.3

Innovation of	*Innovative*	93	59.2	83	65.4	10	33.3
Product	*Non Innovative*	64	40.8	44	34.6	20	66.7
Innovation of	*Innovative*	120	76.4	105	82.7	15	50.0
Process	*Non innovative*	37	23.6	22	17.3	15	50.0

Source: Drawn up by author.