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Conference Paper

Change in firm population and spatial variations: The case of Turkey

38th Congress of the European Regional Science Association: "Europe Quo Vadis? - Regional Questions at the Turn of the Century", 28 August - 1 September 1998, Vienna, Austria

Provided in Cooperation with:

European Regional Science Association (ERSA)

Suggested Citation: Balta, Nazmiye (1998) : Change in firm population and spatial variations: The case of Turkey, 38th Congress of the European Regional Science Association: "Europe Quo Vadis? - Regional Questions at the Turn of the Century", 28 August - 1 September 1998, Vienna, Austria, European Regional Science Association (ERSA), Louvain-la-Neuve

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CHANGE IN FIRM POPULATION AND SPATIAL VARIATIONS: THE CASE OF TURKEY

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Paper prepared to be presented at
**The 38th Congress of The European Regional Science Association,
28 August-1 September 1998 in Vienna**

Abstract: This paper aims to describe how spatial characteristics of regions relate to the growth of firm population in Turkey. Between the observed period, from 1985 to 1992 in most parts of the country change in firm population is negative. The regions with positive rates are located on the main highways of Turkey and they do form an axis from the Southeast through the inner part to the North and Northwest. The major causal factors affecting these changes are rather different for total firm population, micro and non-micro firm population. Although the industrial production characteristics and market growth rate are the main factors for the first two, employment structure is the most influential factor on the growth of Turkish non-micro firm population. While section 1 provides the introductory points of the study, section 2 outlines the profile of Turkish manufacturing industry. Section 3 figures out the changes in firm population within Turkey and the following section conducts spatial variations. The last section is devoted to conclusion, emphasising the need for examination of the causal factors of the firm growth in other sectors as well.

1. Introduction

Although there have always been small and medium size enterprises (SMEs) in each development period of trade and industry, as Humphrey (1995) argues, for a long time they were "an inefficient part of the manufacturing industry and if they were supported the grounds were more social than economic" (p.22). However, rapid technological developments, growth of the service sector, growth of the third world competition and declining international competitiveness, crisis in raw materials and energy prices, changes in the expectations of people from mass standardised goods to crafted ones (Storey 1995) have questioned the understanding of large firms dominating of the "Fordist" production system, as the most effective tool for development.

All these developments resulted in a new production structure, *flexible production* that is based on continuous innovation (Japanese *kaizen* system) and more participation of multi-skilled workers at each production process (Kaplinsky 1995), the requirements of which were seemed to be met by the SMEs in terms of their flexibility in size and operations. For the first time, David Birch, coining the term of "job generation" has claimed that small firms created most of the jobs in the USA (1979). Consequently, after the 1970s they become a focal point of scientific and policy interest. The following revival of role of SMEs has been stimulated either through horizontal linkages among them benefiting from the external economies or through vertical linkages with large firms, subcontracting.

However, in Turkey, the recognition of importance of SMEs took 20 years for both policy and scientific manners. Although from the establishment of republic in 1923, "state capitalism was seen as a supplementary agent for industrial accumulation and private business development" (Ozcan 1995, p.51), the implementation of government schemes to stimulate the development of private sector is the major continuous policy from the 1960s. However, they were far from neither in a sectoral concentration nor size classes. After the 1990s, there emerged some schemes that are directly oriented to SMEs. Mainly, 1996 was dedicated to SMEs and to increase the efficiency of SMEs, the government launched different incentive programs changing from research and development to participation in international fairs. Leaving the development of these policy approaches in one side, for the scientific manners it can be said that most of the academic studies are focused on micro economic issues. The description of their roles in macro economics and regional development as well as their spatial characteristics have not been well documented.

In this paper, change in firm population in the manufacturing industry within Turkey has been viewed between 1985 and 1992. An explanatory model has been developed to determine the major causal factors affecting these changes. Although the data that is supplied by State Institute of Statistics is based on the establishment level, they are referred as "firms" or "enterprises" since the emphasis is on the performance of industrial production in a single physical location rather than a legal entity (for enterprise/firm and establishment definitions, see Ark and Monnikof 1996, Schreyer 1996). Another point is that, due to the presence of many state owned enterprises in Turkey, the study covers the data for the private sector.

The factors bringing regional differentiation in firm population are aimed to be determined by regression and correlation analyses. Multiple least squares regression is applied in the analyses of relationships. However, the models were developed through careful examination of the separate and joint effects of various sets of explanatory variables rather than a mechanical application of a stepwise, R²-maximizing procedure.

2. The Profile of Turkish Manufacturing Industry

Besides the presence of different SME-definition criteria, such as number of persons engaged, fixed assets, turnover figures etc., in this study, firms engaging up to 9 persons are considered as "micro", while those with 10 to 24 persons are classified as "small". Firms in which 25 to 199 persons engaged are called as "medium" and the remaining group employing more than 200 persons, constitutes "large" category. While the number of firms and persons engaged from 1963 to 1992 are given in Table 1, figure 2 and 3 outlines their shares by size classes.

Table 1. Number of firms and persons engaged by size classes, 1963-1992

	1963		1970		1980		1985		1992	
	Firms	Per. Eng	Firms	Per. Eng	Firms	Per. Eng	Firms	Per. Eng	Firms	Per. Eng
Micro*	0	0	325	1928	n.a.	n.a.	183572	472081	186574	545809
Small**	1258	20346	1847	25415	3854	47531	5777	90566	5227	79198
Medium***	1370	81256	2398	127936	4010	202955	3877	233308	4817	296366
Large	146	83372	321	171663	438	249320	599	336711	723	381781
Total	2774	184974	4891	326942	185461	993472	193825	1132666	197341	1303154

*Shows the firms with power equipment of more than 50 HP in 1970

** Corresponds to the category of firms employing 10 to 19 persons in 1963, 1970 and 1980

*** Corresponds to the category of firms employing 20 to 199 persons in 1963, 1970 and 1980

Source: SIS, General Census of Industry and Establishments in various years

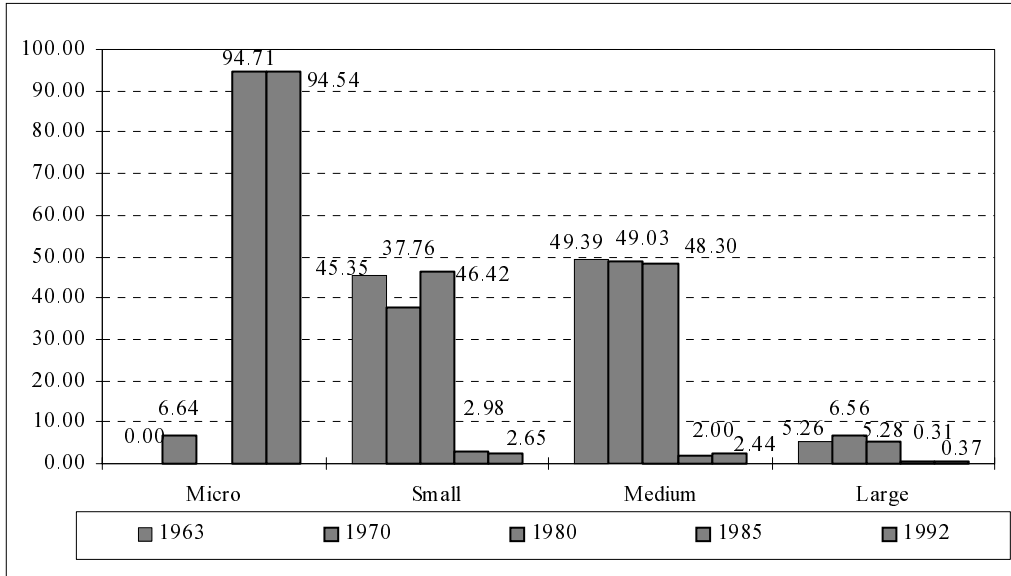


Figure 1. Share of firms by size classes, 1963-1992

Due to data constraints, when the figures for 1970 and 1980 are disregarded, it can be said that as a result of a steady increase in the share of micro firms from 0% in 1963 to 95% in 1992, that of other size classes has decreased. When the number of persons engaged has been viewed by size classes, the rates are much more fluctuated as shown in figure 3. The most important result from these two figures is that, the share of firms and the share of persons engaged are not relatively distributed across the size classes.

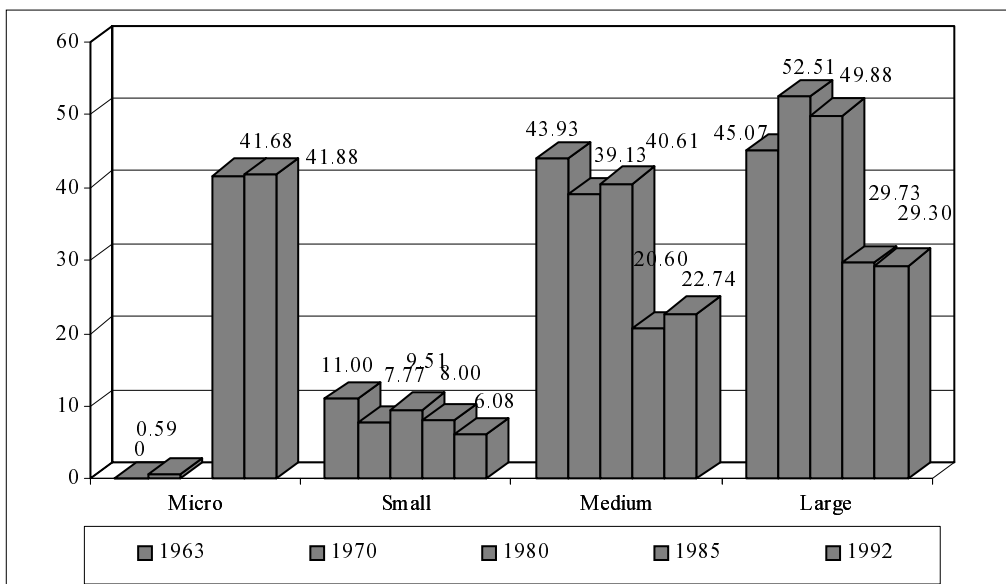


Figure 2. Share of persons engaged by size classes, 1963-1992

After this general view, the developments from 1985 to 1992 will be discussed deeply. The following table outlines the share of firms by size classes in different manufacturing industries for 1985 and 1992. The domination of micro firms in all manufacturing industries is very clear from this table. However, in terms of sectoral concentration, the majority of the firms were gathered in paper products and printing industry and textile, apparel and leather industry both in 1985 and 1992.

Table 2. Share of firms by size classes and manufacturing sector 1985, 1992

Industry	1985					1992				
	Micro	Small	Medium	Large	Total	Micro	Small	Medium	Large	Total
31- Food, beverages, tobacco	10.08	0.70	0.33	0.04	11.14	10.18	0.59	0.33	0.06	11.16
32- Textile, apparel, leather	30.48	0.73	0.48	0.09	31.78	27.32	0.75	0.79	0.13	28.98
33- Wood products and furniture	19.11	0.17	0.07	0.01	19.35	21.95	0.14	0.08	0.01	22.18
34- Paper products and printing	2.30	0.14	0.08	0.01	2.53	3.21	0.09	0.09	0.01	3.40
35- Chemical products	3.88	0.27	0.21	0.03	4.39	2.44	0.19	0.24	0.04	2.90
36- Non-metallic mineral products	2.73	0.12	0.18	0.03	3.07	3.32	0.17	0.22	0.03	3.74
37- Basic metal industries	1.24	0.11	0.12	0.02	1.48	0.91	0.08	0.11	0.02	1.11
38- Fabricated metal products	22.32	0.72	0.50	0.08	23.62	23.68	0.63	0.55	0.08	24.94
39- Other manufacturing	2.58	0.03	0.03	0.00	2.64	1.54	0.03	0.03	0.00	1.59
Total	94.71	2.98	2.00	0.31	100	94.54	2.65	2.44	0.37	100

Being in line with the distribution of firms, the majority of the people is engaged in textile, apparel, leather industry and fabricated metal products in both 1985 and 1992 (see table 3). However, in chemical products, non-metallic mineral products and basic metal industries the share of persons engaged is higher in medium and large firms than micro firms due to more complex production structures.

Table 3. Share of persons engaged by size classes and manufacturing sector 1985, 1992

Industry	1985					1992				
	Micro	Small	Medium	Large	Total	Micro	Small	Medium	Large	Total
31- Food, beverages, tobacco	5.48	1.77	3.39	3.52	14.15	5.68	1.26	3.00	3.93	13.88
32- Textile, apparel, leather	12.10	1.98	5.07	10.75	29.89	11.61	1.75	7.69	10.51	31.56
33- Wood products and furniture	8.34	0.43	0.68	0.26	9.72	8.78	0.30	0.77	0.26	10.10
34- Paper products and printing	1.19	0.36	0.82	0.63	3.01	1.47	0.20	0.90	0.63	3.20
35- Chemical products	1.77	0.74	2.09	2.85	7.46	1.47	0.44	2.15	2.78	6.85
36- Non-metallic mineral products	1.44	0.35	1.86	2.97	6.62	1.68	0.42	1.90	2.27	6.27
37- Basic metal industries	0.61	0.30	1.22	1.29	3.42	0.50	0.19	1.00	1.07	2.76
38- Fabricated metal products	9.75	1.97	5.18	7.33	24.24	10.00	1.45	5.09	7.80	24.35
39- Other manufacturing	1.00	0.09	0.28	0.12	1.48	0.69	0.06	0.24	0.04	1.03
Total	41.68	8.00	20.60	29.73	100	41.88	6.08	22.74	29.30	100

From all these figures, it can be said that in Turkish manufacturing industry the majority of firms are dominated by micro firms (nearly 95%). To eliminate the overwhelming effect of

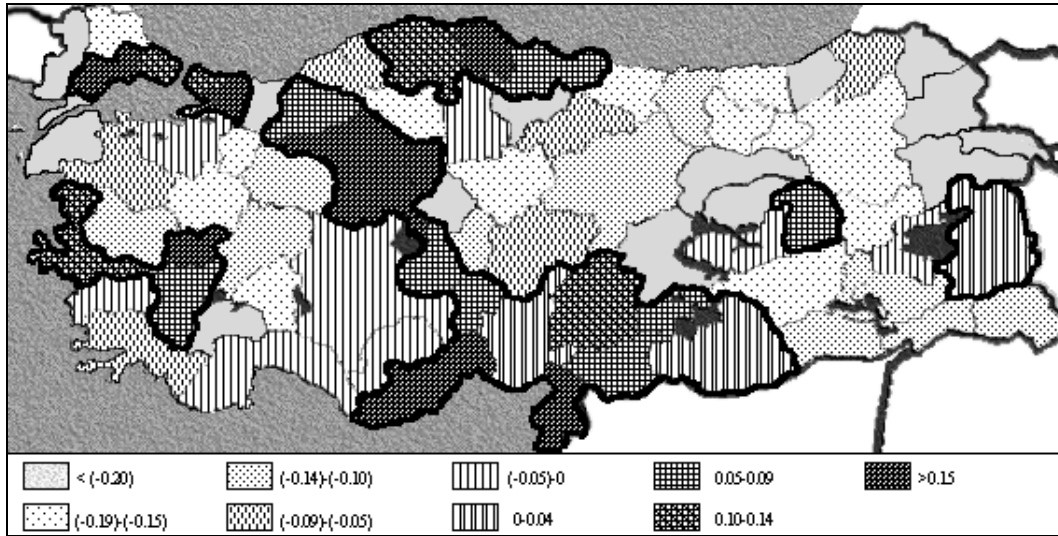


Figure 4. Change in total firm population in Turkey, 1985-1992

The bulk of micro firms in manufacturing industry results in the same growth rate pattern with very close rates as total firms (figure 5). Still the lowest rates are found in the Northeast and the East, while the highest micro firm growth rates are observed in Sinop (0.28) in the North, Icel (0.261) in the South and Usak (0.209) in the West.

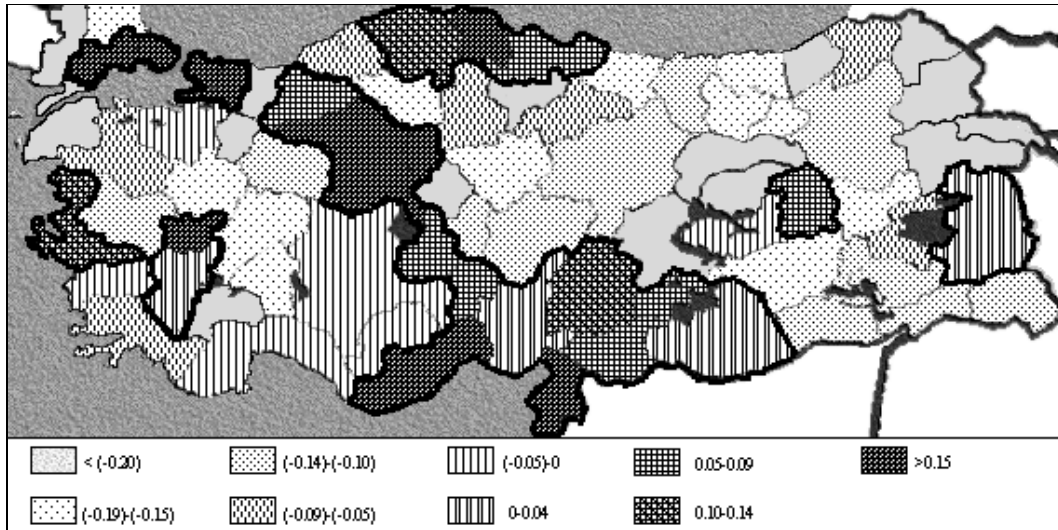


Figure 5. Change in micro firm (<10 persons) population in Turkey, 1985-1992

When the firm growth rate is calculated for non-micro firms employing more than 9 people, a different structure appears. Although there are provinces (Tunceli and Mus in the East) with no firm in this category, the national average is higher (0.05) than the previous two rates. Not only in most regions of the country firm growth rate is positive in a connected

way, but also the negative rates do form an axis, one from the South to the North and another from the East to the interior parts.

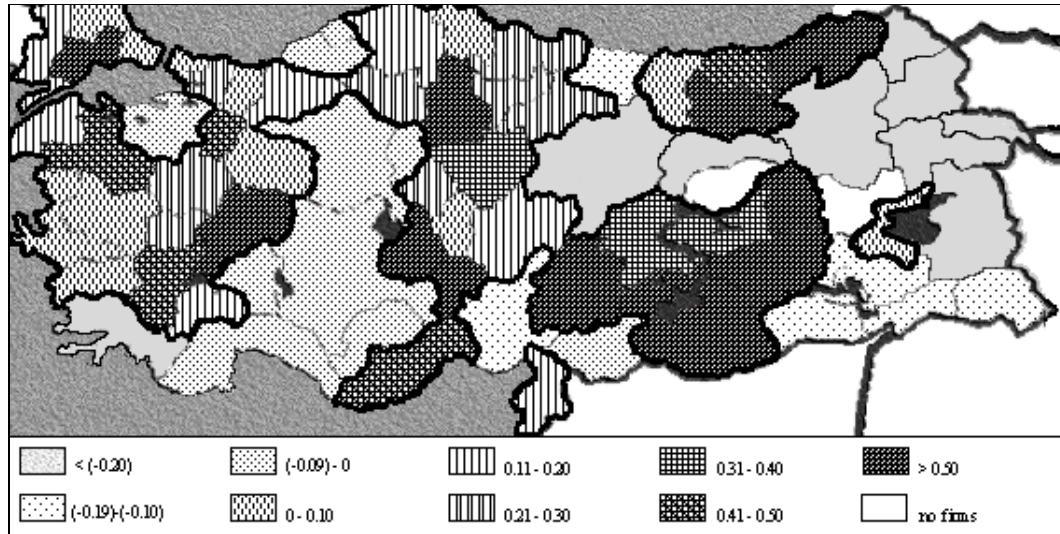
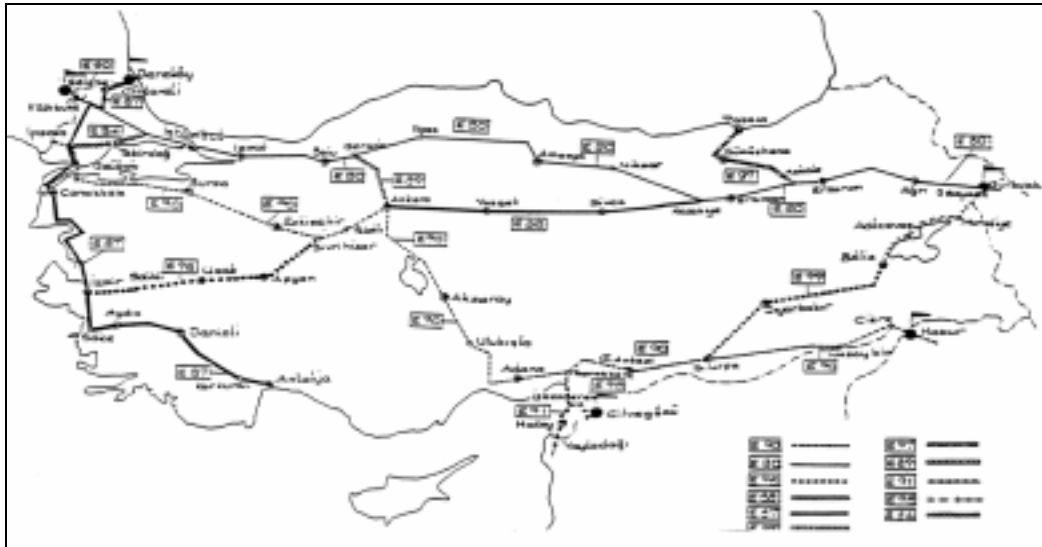


Figure 6. Change in non-micro firm (>10 persons) population in Turkey, 1985-1992

As can be viewed from all these analyses, there seem to be five regions in which the firm growth rates are positive. They are the Istanbul region (Istanbul, Tekirdag and Kocaeli), the Blacksea region in the North (Kastamonu, Sinop and Samsun), the Izmir region in the West (Izmir, Usak, Denizli), and the other two regions forming a geographically connected axis from the Southeast of the country (starting from Sanliurfa, Adiyaman, Gaziantep, Hatay, Kahramanmaras, Icel, Adana) through the interior parts (Nigde, Ankara) to the Northern part, Blacksea (to Bolu).

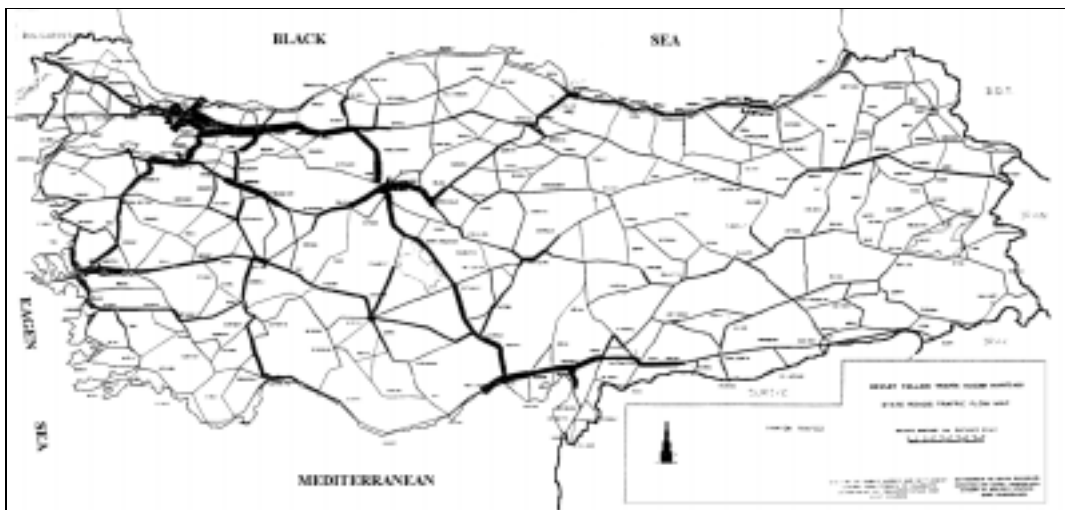
Actually, those regions with positive firm growth rates are on the main highway network of Turkey (see figure 7). The axis from the Southeast through inner parts to the North and the Northwest is very clear. Another axis from the Southwest passing through the West is connected to this axis either in the Northwest or in the interior part, where Ankara is the intersection point. However, this just provide the structure, does not maintain any information about the relations among the cities.



Source: Turkish Directorate of Highways

Figure 7. The highway network in Turkey

To obtain information about the relations among the cities, traffic flow in 1992 is given in figure 8. As can be seen from this figure, the traffic flow in the Istanbul region is the highest, with a peak value around Istanbul. The following dense traffic flows are found in Ankara in the center, Izmir in the West and Icel in the South.



Source: Turkish Directorate of Highways

Figure 8. The traffic flow in Turkey in 1992

However, not only the regions with positive firm growth rates are located on main highways of Turkey, but also there are some regions with negative firm growth rates and very dense traffic flow. To explain those regional variations on the growth rate of firm, the study is

followed by the interpretation of the influential factors in correlation and regression analyses.

4. Spatial Variations in Change of Firm Population in Turkey

To define the factors resulting in different firm growth structures, the social, economic and industrial production characteristics of the provinces are taken into account. Although this study is inspired by new firm formation studies, aiming to determine how structural characteristics of regions relate to new firm formation (for further information see the German case by Fritsch (1992), and Audretsch and Fritsch (1994), the French case by Guesnier (1994), the Irish case by Hart and Gudgin (1994), the Swedish case by Davidsson et al (1994), the British case by Keeble and Walker (1994), and the US case by Reynolds (1994)), a different set of variables that are relevant for the country's economic and social structure were emerged.

As Reynolds et. al (1994) points out, new firm formation is important in terms of i) the provision of new jobs, ii) the involvement of new firms in product or process innovations, iii) the understanding of starting a new business as an important career option for many people, iv) the relationship between higher new firm formation rates and substantial regional prosperity. Besides these gains that can be attributed to the growth in firm population also, as UNECE (1996) points out an increase in number of firms would serve to the transformation to a market economy and the democratisation of society.

In the explanation of change in firm population in Turkish manufacturing industry, three dependent variables are used: change in total firms (CHANTOT), change in micro firms employing less than 9 people (CHANMIC) and change in firms in which more than 9 persons engaged (CHANSM). The hypothesis and their related measures are set up in the following way:

1- Demand. It is assumed that when demand increases, more new firms will be founded to satisfy the diversified needs. The variables included are the rate of population growth (POPGR) between 1980 and 1985, the rate of gross domestic product growth per capita (GDPCAPGR) between 1980 and 1985, and the total demand from other cities for the observed one (DEMAND). This is the difference between the total GDP in the country and the observed city's GDP. However, to measure the impact of market size, the logarithmic

transform of population size, leading to a more symmetrical distribution was used (LGPOPUL).

2- *Urbanization/agglomeration*. With this variable, it is intended to define if there is a relationship between change in firm population and urban areas due to their advantages such as ease of access to customers and inputs, supply of a developed infrastructure etc. The variables used are the square root of population density in order to reduce the overwhelming effect of the very high densities recorded by Istanbul, Kocaeli etc. (SQDENS), average household size (HOUSEH), in-migration rate (MIGR) and the proportion of young population (25-44 years old) (YOUNGPOP) in 1985.

3- *Unemployment*: Reynolds et. al. (1994) claim that “when people lose their jobs with existing organizations, they may well turn to self-employment or attempt to start a new firm” (p.446). However, as Audretsch and Fritsch (1994) claims, "high regional unemployment rates would indicate slack growth, thereby dampening incentives for new firms to locate within the region" (p.360) at the same time. To measure unemployment's impact, the unemployment rate for active population in 1985 has been used (UNEMPLOY).

4- *Employment structure*. To identify the relationship between labor composition, two variables are included: the rate of illiterate population (NONQUAL), and that of graduates in the active population (GRAD).

5- *Social structure*. It is assumed that areas characterized by social mobility and high proportion of individuals in self employment will have higher new firm formation rates. The two variables used are both the proportion of workers (WORKERS) and the proportion of employers (EMPLOYER) in manufacturing industry in 1985. The other variables are the rate of manufacturing (MANUF) and agricultural (AGRIC) employment in total employment.

6- *Household wealth*. Capital is one of the main requirements for business start-up. It is assumed that the greater wealth in an area would bring “greater availability of startup capital and/or borrowing costs” (Reynolds 1994, p.446). The variable used is the amount of bank deposits per capita (DEPCAP).

7- *Size structure*. With regard to the size, the hypothesis of small firm incubator, “suggesting that areas dominated by large firms are likely to generate relatively few new firms” (Garofoli 1994, p.389) is tested. However, to eliminate the bias coming from the use of number of

firms, as Audretsch and Fritsch (1994) points out, a measure of mean establishment size (MEANSIZE) was used. The other variables included are both the proportion of firms in which 10 to 24 persons engaged (SMFIRMS) and the proportion of firms in which more than 200 persons engaged (LMFIRMS) in total manufacturing sector. These rates are calculated for the number of persons engaged also (correspondingly, SMPEREN and LMPEREN). All these variables corresponding to the 1985 figures are disregarded for CHANMIC, except MEANSIZE.

8- *Production structure.* Although this paper deals with why change in firm population differs within the country, the impact of sectoral concentration can be important with the assumption that a high specialization index of industrial employment would result in high rates of new firm formation like in The Third Italy (Garofoli 1994). To measure this variable, the number of persons engaged in each manufacturing industry is divided into total manufacturing employment. Then, they were squared, summed and the square root taken of the sum (Reynolds 1994). However, this operation is repeated for number of firms also (SPECFIR). While the former has a national average of 0.479, and changes from 0.770 to 0.392; the corresponding values for the latter are 0.469, 0.691 and 0.415.

9- *Government investments.* To determine the relationship between government investments and firm growth, five variables are included. These are the total government investments between 1985 and 1992 (GOVERN), the investment incentives between 1985 and 1992 (INCENTIVE), the number of workshops in small industrial estates (SIESHOP) and the number of parcels in the organized industrial districts (PARCEL).

The matrix of correlation coefficients between independent and dependent variables is shown in table 4. Although the correlation coefficients have similar figures for CHANTOT and CHANMIC, CHANSM is rather different. While there is the highest positive relationship between population growth rate and the former two dependent variables (around 0.42), it is achieved by the share of employment in small firms for CHANSM (0.46).

Table 4. Correlation matrix between dependent and independent variables[†]

	CHANTOT	CHANMIC	CHANSM
Demand			
POPGR	0.4226*	0.4273*	
GDPCAPGR			
DEMAND	-0.3127*	-0.3280*	
LGPOPUL	0.3810*	0.3999*	
Urbanisation/ agglomeration			
YOUNGPOP	0.2216**	0.2121**	
MIGR			
HOUSEH	-0.2130**		
SQDENS	0.2818*	0.2909*	
Unemployment			
UNEMPLOY		0.2129**	
Employment structure			
NONQUAL			0.2413**
GRAD			
Social structure			
WORKERS			
EMPLOYER	0.2677*	0.2821*	
MANUF	0.3032*	0.3027*	
AGRIC	-0.2991*	-0.3056*	
Household wealth			
DEPCAP			
Size structure			
MEANSIZE	0.3651*	0.4272*	
SMFIRMS	0.3233*	n.a.	0.2834*
SMPEREN		n.a.	0.4600*
LMFIRMS	0.2515*	n.a.	
LMPEREN	0.3247*	n.a.	
Production structure			
SPEC			0.3883*
SPECFIR			0.3444*
Government investments			
GOVERN	0.2965*	0.3161*	
INCENTIVE	0.3466*	0.3589*	
SIESHOP	0.3145*	0.3188*	
PARCEL	0.3058*	0.3089*	

* Coefficients significant at 0.05 level. ** Coefficients significant at 0.10 level.

[†]The correlation coefficients exceeding 0.10 significance level are excluded.

Those mentioned independent variables are incorporated in the regression analysis of each dependent variable to explain change in firm population in those three groups. After some efforts, the best equation fitted to explain CHANTOT is given below. The F test suggests

that the equation is statistically significant. There is positive relationship between growth in firm population and market size (LGPOPUL), the degree of specialisation of firms in one sector (SPECFIR) and the mean size of firms (MEANSIZE), while the growth rate of GDP per capita (GDPCAPGR) and the rate of manufacturing employment (MANUF) in total employment do have a negative effect.

Dependent Variable: CHANTOT

Independent variables	Coefficient	t-Statistic
Intercept*	-282.07	-4.99
GDPCAPGR**	-1.38	-1.99
LGPOPUL*	30.88	4.00
MEANSIZE*	4.08	4.30
SPECFIR*	1.82	3.42
MANUF**	-1.18	-2.17
R ²	0.40	
F-Statistic	7.93	

* Coefficients significant at 0.01 level. ** Coefficients significant at 0.10 level.

While the introduction of market growth (POPGR) instead of market size (LGPOPUL) in the equation does not only deteriorate the fitness of the rate of manufacturing employment in total employment (MANUF) leading to the exclusion, but also markedly reduce the explanatory power of these four variables to 0.34. Another variable is the degree of specialisation of employment in one sector (SPEC) that makes MANUF insignificant and explains the growth in firm population with the other three variables LGPOPUL, GDPCAPGR, MEANSIZE in an explanatory power of 0.31. Actually all these emphasise that GDPCAPGR, MEANSIZE and SPECFIR are the key influences upon growth in total firm population. However, it is very surprising that neither the location of firms whether urban or rural nor the employment structure have any impact on the growth in firm population.

Although the best equation explaining the growth of micro firm population, CHANMIC is shown below, the R² value is the lowest among other two dependent variable. The F test informs a significant equation with the following variables:

Dependent Variable: CHANMIC

Independent variables	Coefficient	t-Statistic
Intercept*	-80.10	-3.02

POPGR*	0.71	4.18
SPECFIR**	1.23	0.25
R ²	0.24	
F-Statistic	10.04	

* Coefficients significant at 0.01 level. ** Coefficients significant at 0.05 level.

The growth in micro firm population is positively related to market growth rate, captured by population growth rate (POPGR) and the degree of specialisation of micro firms in one sector (SPECFIR). Actually, POPGR explains 0.18 of variation in micro firm population by itself.

The best equation fitted to explain the change in firms employing more than 9 persons, CHANTOT is given below. There is positive relationship between growth in non-micro firm population and the both indicators of employment structure, the rate of illiterate people (NONQUAL) and (GRAD) graduates in active population, the rate of manufacturing employment (MANUF) and the rate of agricultural employment (AGRIC) in total employment, the degree of specialisation of employment in one sector (SPEC), while market size (LGPOPUL) has a negative effect.

Dependent Variable: CHANSM

Independent variables	Coefficient	t-Statistic
Intercept*	-1759.39	-5.08
LGPOPUL**	-61.56	-1.69
NONQUAL*	18.59	9.21
GRAD*	18.35	8.48
MANUF*	10.15	3.20
AGRIC*	4.45	3.03
SPEC**	1.07	2.63
R ²	0.67	
F-Statistic	19.98	

* Coefficients significant at 0.01 level. ** Coefficients significant at 0.10 level.

Actually, as it can be remembered from table 4, showing the simple correlations among the dependent and independent variables, there is a strict difference between the structures of micro and non-micro firms. The rate of illiterate and graduate people in active population do explain the 0.50 of variance in non-micro firm population by themselves. While the market size negatively affects the change in non-micro firm population, it becomes insignificant with the introduction of the degree of specialisation of firms in one sector (SPECFIR) rather

than that of employment (SPEC) and the explanatory power of the equation with the other four variables reduces slightly to 0.64.

However, the participation of MANUF is insignificant with NONQUAL and GRAD unless the introduction of AGRIC and these four variables do explain 0.62 of variation in the change of non-micro firm population. Although the value added of these sectors' are not covered in this study, the companionship of AGRIC and MANUF can be the result of an input-output relationship between them.

Regarding policy evaluation, the main point is that the investment incentives do not have any effect on the growth of firm population. Actually, this is in line with a study examining the relationship between average annual growth rate in investments qualifying for encouragement certificates and growth and export performance within manufacturing industry (Erzan 1995). It is concluded that "the government largely followed investment demand in issuing encouragement certificates" (p.94) rather than a direction of sectoral activities. Another policy implication is that neither small industrial estates nor organised industrial zones affect the change in the firm population.

5. Conclusion

In Turkey, manufacturing employment is not proportionally distributed by size classes, the domination of firms by micro categories is achieved by large firms in terms of employment. In most parts of the country, number of firms has declined from 1985 to 1992. However, the growth patterns of micro firms and non-micro firms are rather different, while manufacturing non-micro firms (employing more than 9 persons) seem to be more stable, the number of micro firms increased in the cities with high population figures.

Beside these differences, the regions with positive growth rates of firm population are located on the main highways of Turkey, the Istanbul region in the Northwest (Istanbul, Tekirdag and Kocaeli), the Blacksea region in the North (Kastamonu, Sinop and Samsun), the Izmir region in the West (Izmir, Usak, Denizli), and the other two regions forming a geographically connected axis from the Southeast of the country (starting from Sanliurfa, Adiyaman, Gaziantep, Hatay, Kahramanmaras, Icel, Adana) through the interior parts (Nigde, Ankara) to the Northern part, Blacksea (to Bolu), showing the impact of infrastructure. As a basic development principle, the advancement of infrastructure and

communication eliminating the transaction costs would bring not only a much more diversified market, but also much more differentiated products.

To define the spatial characteristics in these regions an explanatory model were developed. For the change in total firm population, market size (population figures), the degree of specialisation of firms in one manufacturing industry, the mean size of establishments are the major causal factors affecting these changes in positive way, while the growth rate of GDP per capita and the rate of manufacturing employment in total employment has negative effect. However, the growth rate of population and the degree of specialisation of firms in one manufacturing industry are the main explanatory variables in the change of micro firm population.

In the explanation of the change in non-micro firms, rather than industrial production characteristics employment structure seem to be more important, captured by the illiterate and graduate rate of people in active population. The following two determinants are the rate of manufacturing and agricultural employment in total employment. However, market size and the degree of specialisation of employment in one manufacturing industry have slight effects on the change of non-micro firm population.

As the allocation of investment incentives are not implemented by a sectoral or regional viewpoint, they do not affect the growth in firm population as discussed other studies. However, for the continuing policy of establishment of small industrial estates or organised industrial zones there is no serious study showing their structure or the markets they produce for -domestic or foreign markets-, etc. Although they provide some spatial advantages like infrastructure, according to the results of regression analysis they do not seem to have any effect on the change in the firm population.

However, this study is limited to the manufacturing sector only. Although it provides some insights on the relationship between firm growth and spatial characteristics of the regions, to outline the whole structure of the economy the need of other sectoral studies is very obvious, especially for the service sector.

REFERENCES

ARK, B. van and E. MONNIKHOFF (1996) *Size distribution of output and employment: A data set for manufacturing industries in five OECD countries, 1960s-1990*. Economics Department working papers no:166, OCDE/GD/(96)128 Paris.

AUDRETSCH, D.B. and M. FRITSCH (1994) The geography of firm births in Germany. *Regional Studies*, v.28, n:4, pp.359-365.

DAVIDSSON, P., L. LINDMARK, C. OLOFSSON (1994) New firm formation and regional development in Sweden. *Regional Studies*, v.28, n:4, pp.395-410.

ERZAN, R. (1995) Investment and export subsidies in Turkey. In *Policies for Competition and Competitiveness The Case of Industry in Turkey*, (eds) R. Erzan, pp.91-119, United Nations Industrial Development Organization, General Studies Series, ID/SER.0/17, Vienna.

FRITSCH, M. (1992) Regional differences in new firm formation: Evidence from West Germany. *Regional Studies*, v.26, n:3, pp.233-241.

GAROFOLI, G. (1994) New firm formation and regional development: The Italian case. *Regional Studies*, v.28, n:4, pp.381-393.

GUESNIER, G. (1994) Regional variations in new firm formation in France. *Regional Studies*, v.28, n:4, pp.347-358.

HART, M. and G. GUDGIN (1994) Spatial variations in new firm formation in the Republic of Ireland, 1980-1990. *Regional Studies*, v.28, n:4, pp.367-380.

HUMPHREY, J. (1995) *Industrialisation in developing countries: The challenges of employment and social integration*. UNIDO Background Paper for Global Forum on Industry, Perspectives for 2000 and Beyond, New Delhi, India, 16-18 October 1995.

KAPLINSKY, R. (1995) *The implications of new organisational techniques for developing countries*. UNIDO Background Paper for Global Forum on Industry, Perspectives for 2000 and Beyond, New Delhi, 16-18 October 1995.

KEEBLE, D. and S. WALKER (1994) New firms, small firms and dead firms: Spatial patterns and determinants in the United Kingdom. *Regional Studies*, v.28, n:4, pp.411-427.

OZCAN, G. B. (1995) *Small Firms and Economic Development: Entrepreneurship in Southern Europe and Turkey*. Avebury, England.

REYNOLDS, P. (1994) Autonomous firm dynamics and economic growth in the United States, 1986-1990. *Regional Studies*, v.28, n:4, pp.429-442.

REYNOLDS, P., D. J. STOREY, P. WESTHEAD (1994) Cross-national comparisons of the variation in new firm formation rates. *Regional Studies*, v.28, n:4, pp.443-456.

STOREY, D. J. (1995) The role of small and medium-sized enterprises in European Job Creation: Key issues for policy and research. In *Small and Medium Size Enterprises and Regional Development*, (eds) M. Giaoutzi, P. Nijkamp, D. J. Storey, pp.140-160, Routledge, London.

UN-ECE (1996) *Small and medium-sized enterprises in countries in transition*. United Nations Economic Commission for Europe, IND/AC.3/1, Geneva, 14 February 1996.