

Socio-Economic Structural Analysis of Small Firms in the Forest Product Industry in the Eastern Black Sea Region in Turkey

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Abstract: Structural and statistical analyses of small establishments in the forest products industry were performed in 63 towns and cities in six provinces in the Eastern Black Sea region, which is relatively less developed than many other regions in Turkey. The other objective of this study was to classify the establishments by using various factors. Correlation, cluster and discriminate analysis were used for classification of these establishments. Twenty-five various factors, collected especially from workers, were analyzed. The study was realized using questionnaire forms, filled in with the face-to-face communication method. As a result, 341 questionnaire forms were filled out in 63 locations. Homogeneous town groups were determined based on the forest product industry. Statistical analysis showed that the locations surveyed were classified into five homogeneous groups using structural analysis. Fifty-eight of 63 towns were in the same group and showed the same structure as the forest product industry. The major factors that are found to affect the forming of these groups are access to the market as well as sources of raw material, availability of the raw material, the export potential, and the qualified technical personnel. The group of towns that have a potential for developing the forest product industry and also the group that should have the highest priority for potential investments were determined. Similar financial policies should be applied for the same town groups in the Eastern Black Sea region because of limited financial resources.

Key Words: Forest Product Industry, Small Establishments, Homogeneous Town Groups

Türkiye'nin Doğu Karadeniz Bölgesi'ndeki Küçük Ölçekli Orman Ürünleri Sanayi İşletmelerinin Sosyo-Ekonomik Analizi

Özet: Çalışmamızda, Türkiye'nin diğer bölgelerine göre daha az gelişmiş olan Doğu Karadeniz Bölgesi'ndeki 6 il ve 63 ilçede bulunan küçük ölçekli orman ürünleri sanayi işletmeleri istatistiki yönden incelenmiştir. Ana kütleyi temsil eden 341 adet işletmede oluşturulan anket formu yüz yüze görüşme yöntemi kullanılarak doldurulmuştur. Özellikle çalışanlardan elde edilen 25 değişik faktör orman ürünleri sanayi bakımından homojen yapı gösteren ilçe yapılarının belirlenmesi amacıyla değerlendirmeye alınmış ve bu maksatla korelasyon, küme ve diskriminant analizi yöntemleri kullanılmıştır. İstatistik değerlendirme sonucunda tüm ilçelerin beş homojen gruba ayrılabilceği belirlenmiştir. 63 ilçeden 58'i aynı grup içerisinde yer almış ve orman ürünleri sanayi bakımından aynı yapıyı göstermiştir. Grupların oluşumunda pazara ve hammaddeye yakınlık, hammaddenin varlığı, ihracat potansiyeli ve nitelikli eleman etkili faktörler olarak belirlenmiştir. Bölgede orman ürünleri sanayiinin gelişimi için potansiyel güce sahip ilçe grupları tespit edilmiştir. Sınırlı finansal kaynakların bölge genelinde daha etkin kullanımı için belirlenen ilçe gruplarında aynı politikaların uygulanması gerekliliği belirlenmiştir.

Anahtar Sözcükler: Orman Ürünleri Sanayi, Küçük İşletmeler, Homojen İlçe Grupları

Introduction

Small firms, which play an important role in developing as well as developed countries, have important shares in social stability and have a strategic position in the changing world economy. A remarkable growth in small-scale enterprise occurred in most developed economies during the 1980's. This sudden change in affairs has stimulated a great deal of interest among academics and has also fuelled a range of important

regional development policy initiatives (Milne and Tugts, 1993). Small firms have recently received a great deal of attention from a range of commentators who feel that this form of enterprise may have a leading role to play in the economic restructuring of developed economies.

In recent years, however, an increasing number of researchers have begun to question whether it is really accurate to talk of an emerging flexibility with many concerned that the empirical evidence upon which current

theories of economic change are based is drawn from too limited a range of industrial sectors and an even less convincing set of regional settings (Gertler, 1988). A range of specific concerns have also been raised about the true role that small firms and associated industrial districts are likely to play in the economic landscape of the 1990's (Amin, 1989). The local small firms sell out of the state, and for retail consumption. They have flexible characteristics; they custom produce, they innovate and they use high-technology processing equipment. Flexible production is marked by a decisive geographical concentration of production and by the resurgence of the industrial district. All flexible production industries are marked by organizational fragmentation in which dense, unstandardized, transactional relations between firms are particularly important. Firms concentrate geographically in order to reduce the costs and difficulties of carrying out these transactions and to maximize their access to the cultural and informational context of the production distinct itself (Ruth et al., 1994). The local milieu may be an important influence upon the prospects for small-firm growth and expansion; impediments to growth are likely to vary in nature and scale between regions (O'Farrell and Hitchens, 1988). Proponents of the flexible specialization thesis state that the firm undertaking small-batch production is ideally placed to survive within, and to take advantage of, a manufacturing environment which demands more flexible approaches to production (Piore, 1984). This role is assigned to small firms for a variety of reasons, including their assumed ability to be innovative, entrepreneurial, and organizationally flexible in their outlook. The importance of the small firm-manufacturing environment certainly justifies this attention. Batch production, which dominates small-firm output, is the major form of manufacturing in developed nations (Piore, 1980).

Turkey exhibits regional differences arising mainly from social and natural resources. Each region potentially has various native manufacturing industries, few of which play an important role in that region's economic development. For example, forest industries in the Eastern Black Sea region represent nearly 25% of all the industries. Small firms occupy a large portion in the region and thus have potential for the economic development of the region. For example, forest product industries are effective in job creation in the region.

These small forest industries are scattered across the Eastern Black Sea region. Evidently, it becomes extremely

difficult to formulate effective investments, rigorous policies and applicable strategies to organize the firms towards the best contribution to the region's economy. Therefore, first of all, such a scattered setting needs to be investigated to regionally classify a homogeneous group of firms to formulate effective and efficient management policies for the development of the region's economy.

In this study, we attempted to map the current structure and the arrangements of the small forest firms in the region. Secondly, we statistically analyzed the current structure of the firms and demonstrated the ability to organize them into logical homogeneous groups. Lastly, we recommended that related policies and strategies be formed in order to optimize the contribution of firms to the regional economy and also to the country's economy.

Materials and Methods

Materials

Turkey has seven regions, which are different in terms of level of development. The Eastern Black Sea region has a lower development level than many other regions in Turkey. The region contains 63 towns and six cities [Trabzon, Rize, Giresun, Artvin, Gümüşhane and Bayburt (see Figure 1)]. The population of the region, according to the last national census data, is 2,070,960 and occupies around 3.3% of general population of Turkey.

In this region, 4,211 businesses were determined in the last national census data (DİE, 1994).

Forest product firms accounted for 25% of all firms. One thousand and fifty-four firms had less than nine employees, nine firms had less than 50 employees and five firms had more than 50 employees; thus, there were a total of 3,451 employees in all these firms (Table 1).

The last national census data of industry and business establishments, which is the most extensive research in the manufacturing industry, were used in this study. The firms that have one to 49 employees were assumed to be "small businesses".

Methods

The numbers of establishments were determined for each town and city. Therefore a detailed study on determining the structure of the forest product industry

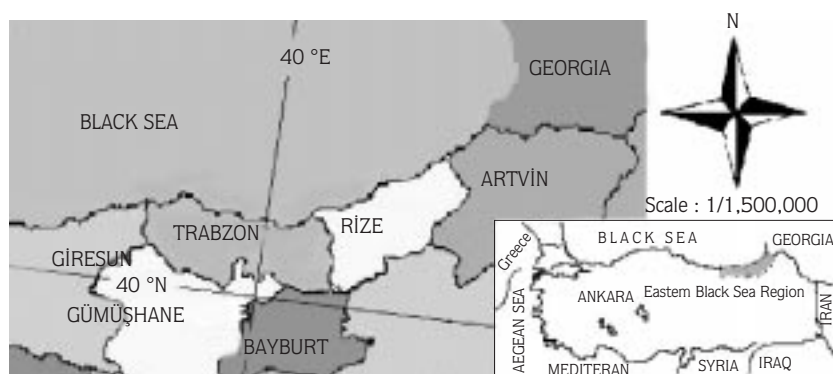


Figure 1. The Cities of the Eastern Black Sea Region

Table 1. The manufacturing industry (MI) and the forest product establishments (FP) in the Eastern Black Sea region

Cities	The number of establishments (FP)	The number of employees (FP)	The number of establishments (MI)	The number of employees (MI)	The ratio of FP establishments to MI establishments (%)	The ratio of FP employees to MI employees (%)
Artvin	73	591	280	2,954	26.0	20.0
Giresun	225	790	844	4,811	26.6	16.4
Gümüşhane	45	92	166	442	27.1	20.8
Rize	213	642	781	14,475	27.2	4.4
Trabzon	470	1,275	2,002	10,257	23.4	12.44
Bayburt	42	61	138	306	30.4	19.9
Total	1,068	3,451	4,211	33,245	25.3	10.3

in each city was conducted. The number of firms (the sample size) for each town and city were determined from the following formula (Sencan, 1993):

$$n = \frac{Z^2 \times N \times P \times Q}{N \times D^2 + Z^2 \times P \times Q}$$

n = sample size, D = Sample size error (this value was assumed to be 10%).

Z = the value of Z distribution (this level for 0.05 is 1.96 and for 0.01 is 2.58),

$P \times Q$ = the variance of binomial distribution

$Q = 1 - P$,

N = population size,

P = the probability of searched properties in population (this probability was assumed to be 50%),

The formula sample sizes for each city are given in Table 2.

Samples were chosen by random selection from the list of the general census of industry and business establishments in 1992. The questionnaire had some questions concerning the firms' establishment year, legal

Table 2. Sample sizes in each city

Cities	The total number of firms	Sample size
Artvin	73	46
Giresun	222	77
Gümüşhane	45	30
Rize	212	76
Trabzon	469	82
Bayburt	42	30
Total	1,063	341

position, location, education levels of employees, and employees' age distribution and this information for each firm was determined. These forms were filled in by the face-to-face communication method.

Results and Discussion

Structural Analysis

There were 1,397 employees in all 341 firms. Since the 1970's there has been a rapid growth in the forest product industries in the Eastern Black Sea region. A large proportion of firms in this region were founded in the 1980's; these account for 32.3% of total firms. The

results of this study agreed well with the study of Milne and Tugts (1993). They stated that a remarkable growth in small-scale enterprise occurred in most developed economies during the 1980's. Amin (1989) noted similar results. Companies founded in the 1960's and the early 1970's account for 34% of all firms, with only 14 existing firms commencing production before 1950.

The firms investigated were classified in terms of their legal status. There were 258 personal status firms, 61 ordinary partnership firms, 13 limited firms, five collective firms and four joint-stock firms. The results showed that especially the firms that had less than nine employees preferred to establish personal status firms. Similar results were reported by Akyüz (2000). In addition, due to legal obstacles and high capital requirements, only four joint-stock companies were established the Eastern Black Sea region. It was also found that there were only 20 firms that cooperated with each other. Low market demands and lack of confidence among firms were the main reasons for the low level of cooperation.

The forest product companies in the region mainly deal with production of furniture and timber. These results are agreement with the finding reported previously by Akyüz (1995). Eighty-eight firms dealt with furniture while 190 firms dealt with timber manufacturing. Fifty firms out of a total of 341 in the region produced both furniture and timber. The remaining 13 firms dealt with manufacturing different products such as beehives, wooden moulds and local goods.

According to our research, the forest product firms showed considerably variation in terms of labor characteristics. Male employees were especially dominant in the small firms. Similar results were reported by Akyüz (2000). Few females were employed in office work. The managements of these firms often felt that males were more suited to the range of different duties.

In the firms sampled, 1,397 workers were classified according to their education level, age and status. Most of the firms employed less than four workers. The workers educated to elementary school level were dominant in these firms. The results agree with those reported by Serin (1997). The workers educated to high school level were always employed by the firms that had more than nine employees.

The employees were classified according to their positions. Among the employees, 877 were part of the family and 219 employees were either the owners or the co-owners.

Statistical Analysis

Variables were used to determine homogeneous town groups in order to create an effective political and economic environment for the forest product industry and aid regional development. Similar results were reported previously (Ruth et al., 1994). For this reason, 25 various variables, collected especially from workers, were analyzed using correlation, and cluster and discriminate analysis methods.

The average values were used for each town because questionnaires were not distributed equally among the towns.

Firstly, the relationships between the variables were determined. The degree of correlation was very high. The critical values of correlation coefficient for the significant values 0.05 and 0.01 were calculated using the following formula (Daşdemir, 1996):

$$r = \sqrt{\frac{t(0.0p)^2}{t(0.0p)^2 + (N - 2)}}$$

According to this formula, for the 0.05 and 0.01 significance levels, the critical r values were 0.24 (d.f = 63 - 2 = 61, $t = 2.00$) and 0.32 (d.f = 61 and $t = 2.660$) respectively. Although high correlation was determined among variables, interpretation was insufficient for the whole system. Thus, multivariate methods, especially cluster and discriminate analysis, were used to compensate for this insufficiency.

Secondly, cluster analyses were applied. Firstly, 63 towns were divided into two groups and then three, four, five and six groups were constituted (Table 3).

Thirdly, constituted groups were analyzed by means of discriminate analysis. Each group was tested according to significance level in discriminate analysis. According to this analysis 63 towns were divided into five homogeneous groups (Table 4).

The Eastern Black Sea region presents a dispersed structure of forestry related to small firms due mainly to the region's rough topographic configurations. These firms are unable to cooperate to form strong relationship or consolidate themselves. As such, current resources are

Cluster	Frequency	%
2	1 st Group 2 towns (Çayeli - Dereli)	3.1746
	2 nd Group 61 towns	96.8254
3	1 st Group 1 town (Çayeli)	1.5873
	2 nd Group 1 town (Dereli)	1.5873
	3 rd Group 61 towns	96.8254
4	1 st Group 60 towns	95.2381
	2 nd Group 1 town (Çayeli)	1.5873
	3 rd Group 1 town (Dereli)	1.5873
	4 th Group 1 town (Beşikdüzü)	1.5873
5	1 st Group 2 towns (Arhavi, Şavşat)	3.1746
	2 nd Group 1 town (Çayeli)	1.5873
	3 rd Group 58 towns	92.0635
	4 th Group 1 town (Dereli)	1.5873
	5 th Group 1 town (Beşikdüzü)	1.5873
6	1 st Group 2 towns (Arhavi, Şavşat)	3.1746
	2 nd Group 56 towns	88.8889
	3 rd Group 1 town (Çayeli)	1.5873
	4 th Group 2 towns (Giresun - center, Trabzon - center)	3.1746
	5 th Group 1 town (Dereli)	1.5873
	6 th Group 1 town (Beşikdüzü)	1.5873

Table 3. Towns groups according to cluster analysis

Table 4. Discriminate analysis for five groups

Discriminate Function	Eigenvalue	Relative Percentage	Canonical Correlation
1	21.492617	48.14	0.97752
2	10.882768	24.38	0.95700
3	7.570733	16.87	0.93956
4	4.74008	10.62	0.90873

Functions Derived	Wilks Lambda	X2	D.F.	Sign. Level
0	0.0000764	445.53297	100	0
1	0.0017186	299.21317	72	0
2	0.0204219	182.88398	46	0
3	0.1742136	82.12124	22	0

not used at full capacity and the state's policies to subsidize these small firms remain ineffective.

The towns studied in the Eastern Black Sea region were divided into five homogeneous groups.

The study showed that 63 towns are clustered into five major homogeneous groups. Of these, 58 towns were grouped into one group and the others formed

almost individual separate groups according to the 25 factors used in the statistical analysis. The major factors that are found to affect the forming of these groups are access to the market as well as sources of raw material, availability of the raw material, the export potential, and the qualified technical personnel. Furthermore, only 10 firms are able to export their products.

Conclusion

The following conclusions were drawn. First, the towns potentially ready for industrial development may be regarded as the center of the forest industry. As presented in Table 4, the five towns should then be prioritized according to the government's regional subsidy program as well as the development policy in terms of the forest product industry. Second, the towns within the same homogeneous group should receive the same development policy, resulting in regional economic prosperity. Third, the towns that are individually grouped are in an advantageous position enabling the investment policy and resources to be effective as opposed to the difficulties in distributing the investment and resource

across 58 towns. Fourth, since most of the firms are unable to penetrate the international market due to insufficient financial resources and lack of international expertise/information, only the few strong firms should be encouraged and supported to become involved in international forest product marketing. Last, the other group, formed by the large number of towns, can operate inside the region or the country enabling them to easily access their market niche and to likely become strong firms. Similar observations were made by O'Farrell and Hitchens (1998). The policy to best allocate the limited resources to these functional groups will be effective enabling each firm to contribute to the economy according to its capacity.

References

- Akyüz, K., 1995. Trabzon İlindeki Küçük ve Orta Ölçekli Orman Ürünleri Sanayi İşletmelerinin Sosyo-Ekonomik Tahlili, Yüksek Lisans Tezi, KTÜ Fen Bilimleri Enstitüsü P. 36.
- Akyüz, K., 2000. Trabzon Doğu Karadeniz Bölgesi'nde Yer Alan Küçük ve Orta Ölçekli Orman Ürünleri Sanayi İşletmelerinin Yapısal Analizi, Doktora Tezi, KTÜ Fen Bilimleri Enstitüsü P. 139.
- Amin, A., 1989. "Flexible specialization and small firms in Italy: myths and realities" *Antipode*, 21 (1): 13-34.
- Daşdemir, İ., 1996. Orman İşletmelerinin Başarı Düzeylerinin Belirlenmesi (Kuzeydoğu Anadolu ve Doğu Karadeniz Bölgesi Örneği) Doğu Anadolu Ormanlık Araştırma Müdürlüğü, Erzurum, Türkiye.
- Devlet İstatistik Enstitüsü, 1994. Genel Sanayi ve İşyeri Sayımı, Birinci Aşama Sonuçları, Türkiye Toplamı, Yayın No:1703, ISBN 975 - 19 - 0921.
- Gertler, M.S., 1988. "The limits to flexibility: comments on the post-Fordist vision of production and its geography" *Transactions of the Institute of British Geographers: New Series*, 13: 419-432.
- Milne, S., S. Tugts, 1993. Industrial restructuring and the future of the small firm; the case of Canadian Microbrewers, *International Journal of Urban and Region Research, Environment and Planning A*, Volume 25 (6) p:847-861.
- O'Farrell, K., P.N. Hitchens, 1988. The relative competitiveness and performance of small manufacturing companies in Scotland and the Midwest of Ireland, *Regional Studies* 22 (5) p: 399-416.
- Piore, M.J., 1980. The technological foundations of Dualism and Discontinuity, in *Dualism and Discontinuity in Industrial Societies*, Cambridge University Press, Cambridge, pp: 55 - 81.
- Piore M.J., C.F. Sabel, 1984. *Second Industrial Divide, Possibilities for Prosperity* (Basic Books, New York).
- Ruth, C.Y., D.F. Joe, H.Y. Christopher, 1994. Flexibility in small manufacturing firms regional industrial formations, *Regional Studies, Journal of the Regional Studies Association*, Volume 28, (1) p: 27-28.
- Sencan, H., 1993. Bilimsel Araştırma Yöntemleri Ders Notları (Basılmamış), İ.Ü. İşletme Fakültesi, Davranış Bilimleri Ana Bilim Dalı, İstanbul.
- Serin, H., 1997. İçel İli Küçük ve Orta Ölçekli Orman Ürünleri Sanayi İşletmelerinin Sos-Ekonomik Yönden İncelenmesi, Yüksek Lisans Tezi, KTÜ Fen Bilimleri Enstitüsü, P. 67.