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Subcontracting and firm characteristics: Evidence from two new local industrial districts in Turkey*

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Abstract

This article examines the nature of subcontracting relations across firms in textile industry in Denizli and Gaziantep provinces which were considered among the new local industrial districts that emerged following the adoption of export-led growth strategies in Turkey during the 1990s. The empirical analysis in the article is based on a unique data set that the authors have constructed using face-to-face survey methods with firm representatives in these two regions. Results show that while in Gaziantep subcontracting relations are primarily motivated by elements of the traditional, dualistic nature of the economy, in Denizli these relationships are more complex and evolved, and involve networking and collective efficiency gains across firms.

Key words: Subcontracting, new industrial districts, textile sector, bivariate probit estimation, Turkey.

JEL codes: C35, D21, L24, L67.

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1. Introduction

The failure of industrialization attempts in developing countries and the prolonged crisis in developed economies during the 1970s and 1980s have created a renewed interest in the potential of small and medium scale enterprises (SMEs) in creating employment and sustaining economic power (Evcimen et al., 1991; Taymaz and Kılıçaslan, 2005; Yasuda, 2005; Özar et al., 2008). During this period, research has concentrated on the growth potential of small enterprises and whether they use resources more efficiently than large scale enterprises (Evcimen et al., 1991). With respect to both policymaking and research, this approach has attached a positive role to subcontracting relations in promoting SMEs[1] with the general premise that through subcontracting links, SMEs' growth and thus employment potential would increase (Watanabe, 1971).

Under this approach, promotion and enhancement of small scale enterprises with flexible production structures is closely related to the formation of small industrial districts at the local scale (Eraydın, 2002; Söylemez et al., 2009). In that respect, emergence of '*New Local Industrial Districts*' is considered to be the most significant outcome of the re-organization of production relations in the form of flexible production modes, including subcontracting arrangements across firms. In Turkey, in the post-1980 era and particularly in the 1990s following the adoption of export-led growth policies, several provinces[2] have emerged as so-called 'New Local Industrial Districts' in addition to the traditionally industrialized provinces such as İstanbul, Bursa, Kocaeli, Ankara and İzmir. In these new local industrial districts, production is mainly organized around small and medium scale enterprises and labor intensive technologies such as textiles. These new industrial districts deserve special attention due to their aspirations and efforts to integrate with global markets and to increase their national market shares (Eraydın, 2002).

The primary purpose of this paper is to reveal the nature of subcontracting relationships, and identify the characteristics of firms engaged in these relationships in textile sector in two of the new local industrial districts in Turkey, namely Denizli and Gaziantep. In doing so, we also aim to discover the firm-level differences in subcontracting behavior (in terms of both hiring a subcontractor and working as a subcontractor) in these two provinces, which are otherwise very similar to each other in terms of manufacturing employment and output growth. Starting with the turn of the 1990s, some provinces in Turkey have shown rapid development, particularly in the manufacturing sector in terms of growth of output and

[1] International organizations such as the World Bank, the United Nations Industrial Development Organization (UNIDO) and the International Labour Organization (ILO) started promoting policies to support SMEs in an attempt to mitigate the problems of unemployment in developing countries (Taymaz and Kılıçaslan, 2005; Müftüoğlu, 2007).

[2] For example, Denizli, Gaziantep, Kahramanmaraş, Konya, Kayseri, Balıkesir.

employment, and these new industrial districts were aptly called 'Anatolian Tigers'. Denizli, situated in southwestern Turkey and Gaziantep, located in southeastern Turkey, are both historically weaving and textile centers of Anatolia. These two provinces were among the forerunners of Anatolian Tigers with above average growth in manufacturing output and employment particularly after the mid-1990s, and not surprisingly, in both provinces, textile manufacturing accounted for the largest share of manufacturing output and employment. What sets them apart is that in Denizli, textile manufacturing sector is predominantly directed towards export to Western Europe and North America while in Gaziantep, textile manufacturing is relatively more domestic-market oriented and export is directed towards Former Soviet Union Turkic and neighboring Middle Eastern countries (Temel et al., 2002).

Another important feature that distinguishes these two Anatolian Tigers is the intensity of subcontracting relations. Subcontracting relations in Denizli particularly in the textile industry are very strong compared to the case in other new industrial districts that exhibited similar improvements in the manufacturing sector during the same period. One of these new industrial districts is Gaziantep, where subcontracting relations are not as developed as in Denizli. According to a comprehensive manufacturing industry study by the Turkish State Planning Organization (now the Ministry of Development of the Republic of Turkey) carried out in Denizli and Gaziantep in 1996, among the micro scale (1-9 workers) enterprises in textile industry, in Denizli 76 percent were engaged in subcontracting while this rate was only 29 percent in Gaziantep (Temel et al., 2002). In Denizli, subcontracting production consisted of 45 percent of total production of these micro scale enterprises, whereas in Gaziantep this rate remained at about 8 percent. In terms of the enterprises with 10 or more workers, the same trend persisted: In Denizli, 68 percent of the enterprises with 10 or more workers were engaged in subcontracting, while this rate was only 17 percent in Gaziantep (Temel et al., 2002).

Examining the nature of subcontracting relations in Denizli and Gaziantep at the firm level will help in understanding under which motives (broadly relating to cutting costs, technological and efficiency gains considerations or capacity considerations) these relationships develop. Additionally, investigation of the subcontracting behavior and inter-firm relationships under these different motives will indicate under what terms and conditions these relationships exist, proceed, and thrive, which will then provide clues about the paths of industrialization and growth that these two provinces follow. In the present analysis, rather than using previously published data, face-to-face surveys were conducted with firm representatives in Denizli and Gaziantep to construct a more in-depth data set about subcontracting relations and firm characteristics, and the survey data comprise of information from the point of view of both the firms which work as subcontractors

and those which hire subcontractors. The survey data are then used in the estimation of the behavior of both working as a subcontractor and using (a) subcontractor(s), in two separate models using a bivariate probit specification.

The contribution of this study to the subcontracting literature is threefold. Firstly, it is demonstrated that diverse forms of subcontracting relations may emerge under different conditions in different regions, albeit in the same country and in the same industry. Secondly, findings of this study indicate that the probability to work as a subcontractor is relatively better explained by firm-specific characteristics than the probability to hire (a) subcontractor(s) is. Finally, in contrast with the literature that attributes a positive role to subcontracting relations on the grounds of employment creation, capital accumulation and the growth potential of small and medium scale enterprises, from the survey results it can be inferred that in a developing country case, working as a subcontractor nevertheless can be associated with financial constraints along with poor opportunities to invest and grow.

The rest of the paper is organized as follows. The next section reviews the nature of subcontracting relations under different theoretical approaches. Section 3 describes the field survey data used in the empirical analysis. Section 4 develops the model and presents the estimation results. Section 5 concludes the study.

2. Literature on the nature of subcontracting relationships

Decentralization of production, i.e. the geographical dispersion and division of production, including diffusion and fragmentation of labor, has been an important feature of re-organization of production in the early 1970s in developed economies such as Britain, Japan, US and Italy (Murray, 1983). The debates about 'flexibility' began to emerge right around this period of time. Flexibility at the macro level was mediated by globalization and deregulation, while at the micro level, it was reflected through new technologies and flexible production modes.

During this period, in addition to limiting and reducing the demand for labor, the process leading to differentiation in labor use and modes of labor control has been initiated (Murray, 1983; Özar and Ercan, 2004). Fractionalization of the production process and positioning of each fraction in the most favorable site have provided the firms with the opportunity to utilize labor in the most efficient, in other words, in the least cost manner. Relocation of production from plants and organized labor has provided the employers with the convenience of use of informal and unregistered labor. Typically, at one end of this production process, a large scale firm is located, while at the other end, a relatively smaller scale firm can be found. Production relations across firms have been investigated under the term 'linkages' in the related literature (Arimah, 2001; Ajayi, 2003). Ajayi (2003) categorizes these linkages under three headings: backward linkages, forward linkages and sideways linkages. Subcontracting can be thought of as a subset of such productive linkages.

While there is no clear-cut definition for subcontracting, in this relationship invariably there is a parent firm offering the subcontract which requests another independent enterprise to take on all or part of the order it has received instead of doing the whole work itself, while undertaking all the responsibilities of the work against the final customer (Watanabe, 1971).

In the subcontracting literature, there are three main theoretical approaches to explain why firms engage in subcontracting relationships: the dualistic approach, the transaction cost approach, and the flexible specialization approach. These three approaches provide the theoretical predictions on firm-level characteristics which are linked to subcontracting behavior, both in terms of the firms working as subcontractors, and the firms hiring subcontractors.

2.1. The dualistic approach

According to the dualistic approach, subcontracting is an unequal power relationship between two heterogeneous and segmented sets of enterprises, i.e. large corporations and small firms (Berger and Piore, 1980), and this relationship is regarded as one in which large contractors reap benefits at the expense of small subcontractors (Taymaz and Kılıçaslan, 2005). In the dynamic theory of dualism, Berger and Piore (1980) suggest that large firms use subcontracting strategically in order to survive uncertainty and change by shifting many of the production processes to the secondary sector and thus avoiding the risks (Nishiguchi and Brookfield, 1997).

Watanabe (1971) points out that small firms may choose to work as subcontractors mainly to cope with their marketing deficiencies, and subcontracting facilitates the entry into the industry as it also alleviates the obstacles to their survival and subsequent development. On the other hand, one of the main motives for a large firm to subcontract production out rather than to have it performed in-house is cutting production costs in order to gain price advantage in the market (Watanabe, 1971; Abraham and Taylor, 1996; Taymaz and Kılıçaslan, 2005; Holl, 2008; Diaz-Mora, 2008; Diaz-Mora and Triguero-Cano, 2012). Under this motive, subcontracting allows the parent firm to escape certain regulations on production and market transactions, union contracts, taxes, and fringe benefits, and shift employment towards more unregulated or informal segments of the economic system (Beneria, 1989). The second main reason for subcontracting production out is to smooth out and maintain a steady flow of work and gain higher flexibility when fluctuations and cyclicality in demand or market conditions are present (Watanabe, 1971; Holmes, 1986; Abraham and Taylor, 1996; Taymaz and Kılıçaslan, 2005; Holl, 2008; Diaz-Mora and Triguero-Cano, 2012). This type of contracting is known as capacity subcontracting (Watanabe, 1971; Holmes, 1986) and in capacity

subcontracting, firms tend to contract tasks out to meet peak demands without having to keep redundant capacity during off-peak periods.

2.2. Transaction cost approach

Transaction cost theory has been developed to understand the governance decision of organizations with the view that cost-economizing is the core problem of economic organization (Williamson, 1979; 1981; 1989). Building on the seminal works of Williamson (1989) and Grossman and Hart (1986), a body of literature that focuses on the role of transaction costs, asset specificity, and incomplete contracts in the firm's choice between in-house production and subcontracting has emerged. The decision to outsource or subcontract production out would depend on various coordination costs associated with setting up and maintaining a subcontracting relationship (Holl, 2008; Diaz-Mora, 2008). These costs may relate to search costs to find suitable partners, negotiation costs, costs to design and enforce the contract, the incomplete contracts problem and technology transfer risks (Grossman and Hart, 1986; Grossman and Helpman, 2002, 2005; Diaz-Mora, 2008).

In a general equilibrium model with costly search and imperfect contracting, Grossman and Helpman (2002) show that subcontracting is more likely to be feasible in large industries and economies, where firms find more potential subcontracting partners and where they benefit from having a "thicker" market. Based on a "transactions-cost" model, McLaren (2000) in fact demonstrates that international openness "thickens" the market and makes the "arm's-length" arrangements (involving independent suppliers) more attractive. In a model of international trade where export activity involves lower fixed costs at home country whereas serving the foreign market through local subsidiaries (or, foreign outsourcing) entails lower variable costs, Helpman et al. (2004) argue that intra-industry firm heterogeneity in terms of firm productivity is crucial in explaining firms' foreign activities. In particular, as in Melitz (2003), they show that the least productive firms serve the domestic market, while more productive firms export, and the most productive ones use local subsidiaries abroad. Additionally, firms are more likely to choose to use local subsidiaries abroad when transport costs are high. Following up on Helpman et al. (2004), Antràs and Helpman (2004) develop a North-South model of global outsourcing where the final-good producer of the North faces the proximity-concentration trade-off of lower fixed costs in the North and lower variable costs in the South. Based on this model, they conclude that a decline in the costs of foreign sourcing (be it in the form of a reduction in trading costs of intermediate inputs or a reduction in Southern wages) would raise "arm's-length" trade (foreign outsourcing) among firms relative to vertical integration.

2.3. Flexible specialization approach

Proposing it as a company-level response to the economic downturn of the late 1970s, Piore and Sabel (1984) describe flexible specialization as "a strategy of permanent innovation". Unlike the industrial development strategy of mass production, which makes use of product-specific machinery and of semi-skilled labor to produce standardized products, flexible specialization industrialization strategy is based on "…flexible - multi-use - equipment, skilled workers, and the creation, through politics, of an industrial community that restricts the forms of competition to those favoring competition" (Piore and Sabel, 1984: 17), allowing firms to produce a wide and changing range of products for changing markets (Nishiguchi and Brookfield, 1997).

In subcontracting relationships involving flexible specialization, essentially the core motive is again to reduce production costs by taking advantage of the outside supplier's economies of scale in provision of the service or technology (Watanabe, 1971; Holmes, 1986; Holl, 2008). However as Abraham and Taylor (1996) suggest, this motive is nevertheless different from merely cost-cutting motivation because it involves technological considerations rather than simply labor market or industrial relations exigencies, and this type of subcontracting is more likely to lead to increases in industrial efficiency than capacity subcontracting (Watanabe, 1971; Van Dijk, 1995). According to this view, subcontracting allows the firms to focus on their core competencies where they are most efficient and subcontract the rest. This view is reiterated in Giunta et al. (2012) as subcontract offering firms tend to cut down on their role at the core of manufacturing production and concentrate on more profitable activities such as design, engineering and marketing. It is suggested that as a result, subcontracting relationships evolve to allow for higher specialization of subcontract receiving firms which are now in a position to offer more differentiated and innovative products and services to a wider range of customers and gain higher autonomy in the global market.

Furthermore, in subcontracting relationships involving flexible specialization, the traditional dichotomous view that subcontracting is between a large/client firm and a small/subcontractor firm is no longer valid; as Taymaz and Kılıçaslan (2005) state, firms may cooperate through horizontal cooperation (to collectively achieve scale economies), vertical cooperation (as the firms specialize in their core activities and take advantage of external division of labor) and networking among enterprises, business development providers, and local policymakers.

One may regard these conceptualizations not necessarily as alternatives, but as complementary models that describe inter-firm relationships at different stages of development of an economy. Presence of diverse approaches for explaining subcontracting relations implies that as determinants in subcontracting decision, firm characteristics are crucial (Abraham and Taylor, 1996). Despite the breadth of

the literature and interest on subcontracting relations, empirical research on the firm level determinants of subcontracting is relatively limited:[3] For the US manufacturing industry Abraham and Taylor (1996), for the Japanese manufacturing industry Kimura (2002) and Tomiura (2005), for the Turkish textile and engineering industries Taymaz and Kılıçaslan (2005), for the Spanish manufacturing industry Holl (2008), Diaz-Mora (2008) and Diaz-Mora and Triguero-Cano (2012), for the Spanish construction industry Gonzales-Diaz et al. (2000), for the Irish electronics industry Görg and Hanley (2004), and for the UK manufacturing industry Girma and Görg (2003).

Among the firm level characteristics as the determinants of subcontracting decision, unit labor costs, firm size, firm age, export activity, R&D expenditures, and market fluctuations stand out in the empirical studies listed above. Some studies also consider the size of the industry as an important factor in subcontracting decision. In essence, the dualistic approach to subcontracting brings labor cost differentials and firm size forward as the core factors in subcontracting decision. In the studies mentioned above, it is found that high wage establishments tend to use more subcontractors or contract out a larger fraction of their production process. While Holl (2008) and Taymaz and Kılıçaslan (2005) find that larger firms have a higher propensity to subcontract their production activities out, in Diaz-Mora and Triguero-Cano (2012) and Kimura (2002) firm size is not found to be a significant factor in the decision to use subcontractors. On the other hand, Kimura (2002) and for the Turkish textile industry Taymaz and Kılıçaslan (2005) establish that the probability to work as a subcontractor declines as the firm size increases. Based on Japanese manufacturing sector firm-level data, Doi and Cowling (1999) find that more than 50 percent of all SMEs work as subcontractors while this ratio is larger for firms with less than 30 employees.

The dualistic economy approach to subcontracting also claims that subcontracting can be used as a tool to reduce costs through "production smoothing", where (large) firms use (small) subcontractors in case of market fluctuations, and when they reach the limits of their productive capacity (Berger and Piore, 1980; Kaytaz, 1994; Taymaz and Kılıçaslan, 2005). In a survey involving textiles and metal-working firms in Istanbul-Kocaeli industrial region in Turkey, Kaytaz (1994) finds that the dominant reason for offering subcontracting for both small and large firms is insufficient capacity. Furthermore, Holl (2008) and Diaz-Mora and Triguero-Cano (2012) show that there is a positive relationship between market fluctuations and subcontracting behavior, indicating that firms want to gain higher flexibility in the face of frequent market changes.

[3] Except for Taymaz and Kılıçaslan (2005) and Kimura (2002), these studies look into the determinants of the decision to "*use a subcontractor*". Taymaz and Kılıçaslan, and Kimura also consider the determinants of the decision to "*work as a subcontractor"*.

In order to capture the transaction cost factors in a firm's subcontracting decision, several studies consider the firm's age as a core element. With age, firms can learn about the quality and reliability of their potential partners and through this "learning-effect" which reduces the firm's search costs, more mature firms may find it easier to find suitable subcontractors (Ono, 2003; Holl, 2008). Along this reasoning, Holl (2008) also finds that the more mature the firm is, the higher is the firm's probability to use an outside subcontractor whereas in Diaz-Mora and Triguero-Cano (2012), firm age is not found to be a significant factor in subcontracting decision. As mentioned above, market thickness is an important factor in determining transaction costs. As in Spencer (2005), Grossman and Helpman (2002), and McLaren (2000), indicators of market thickness can be the size of the industry and the economy, and the degree of international openness. Under these theoretical predictions, Kimura (2002) and Diaz-Mora and Triguero-Cano (2012) show that being an exporter positively affects the probability of using a subcontractor, whereas the probability of working as a subcontractor declines significantly if the firm has export activity (Kimura, 2002). This finding is closely related to the argument set forth in Razzolini and Vannoni (2011) that subcontracting and exporting is in fact a self-selection process.[4] Razzolini and Vannoni state that firms that export are also those firms with highest productivity and those which choose to be vertically integrated; on the other hand, firms with lowest productivity levels are those which do not engage in export activities, and those which only serve the domestic market and fulfill production orders made by parent or commissioning firms. As another predictor of reduction in transaction costs, Diaz-Mora and Triguero-Cano (2012) introduce industry size (employment in industry) into their analysis and find that a larger industry size increases the probability of subcontracting decision by the firms.

To test the determinants of subcontracting behavior under flexible specialization motive, Diaz-Mora and Triguero-Cano (2012) introduce product differentiation, product innovation, process innovation and the firm's R&D investment as explanatory variables. Theoretically, all of these factors are predicted to influence a firm's propensity to subcontract production out positively. Taymaz and Kılıçaslan (2005) also consider the composition of the firm's labor force (female labor, skilled labor, administrative personnel) as a determinant in the firm's subcontracting decision under specialization motive. Empirical studies that consider the flexible specialization motive in subcontracting relationship show that firms with higher share of R&D expenditures and relatively more skilled personnel have a higher tendency to contract out production (Kimura, 2002; Diaz-Mora, 2008; Diaz-Mora and Triguero-Cano, 2012; Taymaz and Kılıçaslan, 2005; Tomiura,

[4] On a related note, Melitz (2003) shows that in the existence of export costs, only the most efficient firms benefit from international trade in terms of higher market share and higher profits.

2005), while firms that employ relatively more unskilled workers tend to work as subcontractors[5] (Taymaz and Kılıçaslan, 2005). In Table 1, explanatory variables representing firm characteristics associated with an underlying theoretical foundation and expected signs in previous subcontracting literature are summarized.

In the next section, the field survey and the data obtained from the survey are presented. The questionnaire has been designed to reveal the nature of the subcontracting links predicted by various theoretical approaches from the point of view of the firms that use subcontractors as well as those that work as subcontractors, and for that matter, compared to the existing literature, the survey has a more exhaustive and detailed outlook on the nature of the subcontracting relations.

3. Data and the field survey

The data set that is used in this study is based on a survey conducted by the authors in summer of 2006 in Denizli and Gaziantep provinces focusing on the textile industry. As of June 2006, at the time of the survey, there were 647 textile sector establishments in Gaziantep listed in the Gaziantep Chamber of Industry. Out of this list, 257 textile establishments[6] which were located in the Gaziantep Industrial Zone were listed in alphabetical order,[7] and were called for an appointment. In the present study, the goal is to identify the firm level characteristics linked to subcontracting behavior rather than implement a policy analysis, consequently purposive sampling was targeted in this study; nevertheless a full scan was conducted to keep track of the full population of 257 establishments. Out of 257 firms in the Gaziantep Industrial Zone, 100 (39

[5] For the Turkish textile industry, Taymaz and Kılıçaslan (2005) find that employing proportionately more female workers tends to increase the probability of both working as a subcontractor and using a subcontractor. This implies that in the Turkish textile industry, subcontracting links are instituted between firms that carry out more 'feminized' activity.

[6] Throughout the study, the terms 'firm', 'establishment' and 'enterprise' are used interchangeably.

[7] Listing the firms in alphabetical order assures random access to firms.

Table 1

Subcontractring Explanatory Variables and Underlying Theories in the Existing Literature

Dependent variable: Using (a) subcontractor(s)			
Underlying Theory	Explanatory Variable	Expected Sign	Previous Literature
Dualism	Wage	+	Watanabe (1971); Abraham and Taylor (1996); Taymaz and Kılıçaslan (2005); Holl (2008); Diaz-Mora (2008); Girma and Görg (2003); Diaz-Mora and Triguero-Cano (20
	Firm Size	+	Abraham and Taylor (1996); Taymaz and Kılıçaslan (2005); Holl (2008); Diaz-Mora (2008); Girma and Görg (2003); Kimura (2002); Tomiura (2005)
	Cyclicality, demand fluctuations	+	Watanabe (1971); Taymaz and Kılıçaslan (2005); Diaz-Mora (2008); Holl (2008); Diaz Mora and Triguero-Cano (2012)
	Unionization	+	Abraham and Taylor (1996); Girma and Görg (2003)
	Legal status (foreign ownership)	?	Holl (2008); Diaz-Mora (2008); Girma and Görg (2003)
Transaction cost	Market or industry size (measuring export propensity)	+	McLaren (2000); Grossman and Helpman (2002); Kimura (2002); Diaz-Mora and Triguero-Cano (2012)
	Firm age	+	Holl (2008); Diaz-Mora (2008); Ono (2003)
Flexible Specialization	High technology/ Intensity of computer usage	+	Tomiura (2005); Diaz-Mora (2008)
	Capital-labor ratio; capital intensity	+	Kimura (2002); Tomiura (2005); Taymaz and Kılıçaslan (2005)
	Human capital-labor ratio, share of skilled workers in engineering industry	+	Tomiura (2005); Taymaz and Kılıçaslan (2005)
	Female workers	+	Taymaz and Kılıçaslan (2005)
	R&D intensity (product differentiation)	+	Kimura (2002); Tomiura (2005)
	Networking (regional clustering)	+	Taymaz and Kılıçaslan (2005)
Dependent variable: Working as a subcontractor			
Underlying Theory	Explanatory Variable	Expected Sign	Previous Literature
Transaction cost	Firm Size	-	Kimura (2002); Taymaz and Kılıçaslan (2005)
	Cyclicality, demand fluctuations	+	Taymaz and Kılıçaslan (2005)
	Export (foreign sales)	-	Kimura (2002)
Flexible Specialization	Capital-labor ratio; Capital intensity	-	Kimura (2002); Taymaz and Kılıçaslan (2005)
	Share of skilled workers (textiles or engineering industries)	?	Taymaz and Kılıçaslan (2005)
	Female workers	+	Taymaz and Kılıçaslan (2005)
	R&D intensity (product differentation)	-	Kimura (2002)
	Networking (regional clustering)	+	Taymaz and Kılıçaslan (2005)

percent) have participated in the survey.[8] Realizing that the number of firms to be surveyed in Gaziantep Industrial Zone was lower than expected, the sample size was increased by haphazard or accidental sampling.[9] Therefore, in addition to the firms located in the Gaziantep Industrial Zone, following accidental sampling procedures, an additional 152 textile firms were randomly accessed in other industrial districts of Gaziantep (Karatarla District, Ünaldı District, and KÜSGET Small Industrial District as suggested by the representatives at Gaziantep Chamber of Industry). In total, 252 establishments were anonymously surveyed. On the other hand, as of July 2006, 627 establishments were listed in Denizli Chamber of Industry and 83 were active textile sector establishments in the Denizli Industrial Zone. As in Gaziantep purposive sampling was targeted, these establishments were listed in alphabetical order, called for an appointment, and 32 (39 percent) of these firms were available for the survey at the time. Since the resulting sample size turned out to be smaller than expected for the scope of our study, in accordance with accidental or haphazard sampling procedures an additional 160 textile firms outside the Industrial Zone were accessed randomly in other industrial districts of Denizli (Zafer Industrial District and Sümer Industrial District as advised by the representatives at Denizli Chamber of Industry), and in total 192 textile establishments were surveyed anonymously. The survey data were analyzed using the SPSS 15 statistical program and the reliability of the survey was confirmed as the data were found to be internally consistent.

The survey consists of three main parts: in the first part of the questionnaire, a general outlook of the firms in textile industry in Denizli and Gaziantep was aimed with survey questions to specify firm characteristics. In the second part of the questionnaire, tendencies towards working as a subcontractor and hiring a subcontractor were surveyed and in the final part of the questionnaire, the issue of competition and coordination among firms was undertaken. In essence, the survey's questions have been designed to reflect the core theoretical predictions (i.e. based on the three theoretical approaches: dualistic approach, transaction costs approach, and flexible specialization approach) of subcontracting relationships among firms.

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[8] During the full scan it was found out that some of the firms in the list stopped production, some changed location, some managers or firm representatives were out of town or unavailable, or some did not want to partake in the survey although they did not have any prior information about the contents of the survey.

[9] In *haphazard, accidental, convenience*, or *fortuitous* sampling procedure, the samples are selected based on convenience, but still chosen as randomly as possible (Westfall, 2009). In such sampling procedures, samples which are willing to participate in a study are drawn from classrooms, organizations, or neighborhoods that are convenient to the researcher (Hackett, 1981; Kitson et al., 1982; Teddlie and Yu, 2007).

4. The empirical investigation

In this section the empirical model specification and model's variables used for estimation are presented. Following the literature given in Section 2, it is hypothesized that the probability of working as a subcontractor, and the probability of using (a) subcontractor(s) are both associated with certain variables which symbolize firm-specific characteristics. Accordingly, the probability of working as a subcontractor, and the probability of using (a) subcontractor(s) are estimated in two separate models with a bivariate probit specification.

4.1. Model specification and variables

Empirically, the following binary choice model is utilized in order to estimate the influence of several firm characteristics on firm's subcontracting decision:

$$Y_w^* = X_w\beta_w + \varepsilon_w, \qquad Y_w = 1 \quad if \quad Y_w^* > 0,\ 0\,\text{otherwise}$$
$$Y_u^* = X_u\beta_u + \varepsilon_u, \qquad Y_u = 1 \quad if \quad Y_u^* > 0,\quad 0\,\text{otherwise}$$

Separate equations for each kind of subcontracting behavior (*w*: working as a subcontractor, *u*: using a subcontractor) are jointly estimated. The dependent variable Y^* is the unobservable underlying variable that represent firm's propensity to engage in some subcontracting behavior, Y is the actual choice of subcontracting of the firm, X is the set of firm characteristics and ε is the error term. In estimating the model, the possibility that attitudes towards working as a subcontractor and using a subcontractor are jointly determined is taken into account i.e. the unobserved factors that affect these activities might be correlated. Thus it is assumed that residuals are correlated $(Cov[\varepsilon_w, \varepsilon_u|X_w, X_u] = \rho)$ and the specification used is a bivariate probit. The advantage of the bivariate model is that in addition to the results associated with each regressor, it provides an estimate of the interrelatedness of the two decisions under consideration (Greene, 2007). Correspondingly, together with the estimation results, test results for cross-equation correlation are also reported (the hypothesis of $\rho=0$). As all the regressors in the estimations are hypothesized to be associated with both working as a subcontractor, and using (a) subcontractor(s) in the relevant literature, same regressors for both equations are used $(X_w=X_u)$.

The regressors of the model[10] involve firm-specific characteristics (SMALLEST, LARGEST, AGE, REGIS, CRED, RENT, STAT, INSUR, SPEC, COMP, CERT, EXPORT, CRIT, FEMALE, EDUC, WAGE), sub-sector dummies S3212, S3213, S3214 and S3219 that take the value of 1 if the firm operates in manufacture of made up textile goods, knitting mills, manufacture of carpets and

[10] A description of the variables is provided in Appendix Table A1.

rugs and manufacture of textile goods n.e.c. respectively, and a dummy that takes the value 1 for firms operating in Denizli. In this study the aim is to test the theory-based factors that are associated with subcontracting behavior, and some of the variables that are chosen to represent various firm characteristics, such as SMALLEST AND LARGEST (both representing size), AGE, EXPORT, FEMALE and WAGE, come from the previous literature. In addition to these, some novel and essential variables signifying different firm characteristics, i.e. REGIS, CRED, RENT, STAT, INSUR, CERT, CRIT, EDUC, SPEC and COMP, were included in this study. Each variable included in the regression analysis may be associated with a theoretical approach, for example SMALLEST and LARGEST, REGIS, CRED, RENT, STAT, INSUR and WAGE with the dualistic economy approach, AGE, CERT, and EXPORT with the transaction cost approach, and FEMALE, CRIT, EDUC, SPEC, and COMP with the flexible specialization approach, although there may also be some overlapping across these approaches. Below, we provide the description of each explanatory variable used in the regressions.

4.1.1. Firm size (SMALLEST and LARGEST)

According to the dualistic economy approach, firm size (represented by the number of workers) is one of the main determinants of subcontracting: larger firms tend to offer subcontracting to smaller firms under a motive to cut in-house production costs, and smaller firms tend to receive subcontracting as it increases their chances of survival and development in the industry.

In many previous studies examining subcontracting relations, including Diaz-Mora and Triguero-Cano (2012), Park, et al. (2010), Holl (2008), Yasuda (2005), Taymaz and Kılıçaslan (2005), and Kimura (2002) regard the number of workers, or the number of employees as the indicator of size of an establishment. By taking the number of workers of the firm into account, the employment potential of the firm is controlled. Additionally, Kumar, et al. (1999) measures the size of the firm in terms of its number of employees. Kumar et al. argues that the complexity of the firm organization is related to the value of its contribution, or the value added, and that the value added per employee is rather stable across different size-classes. Hence, Kumar, et al. supports that a measure of firm size based on the number of employees is a good representative of a measure based on value added.

In the present empirical investigation, to control for the smallest firm size, SMALLEST dummy variable, and to control for the largest firm size, LARGEST dummy variable were used. SMALLEST is a dummy representing the firms with 1-9 workers, while LARGEST is a dummy that stands for the firms with 250 or more workers. These dummy variables were included rather than a variable representing the number of employees (SIZE) since the relation of the SIZE variable with subcontracting (either working as or hiring) may be non-monotonous.

4.1.2. Firm age (AGE)

Firm age is included as an explanatory variable to capture the transaction cost factors affecting the firms' subcontracting decision. Effectively, the more mature the firm is, the easier it is for the firm to find suitable partners for subcontracting; moreover, more mature firms find it more viable to start concentrating on their core activities and demonstrate a higher propensity to subcontract part of production out.

4.1.3. Registration status (REGIS)

The firm's registration and membership status in any one of the chambers or associations of commerce, craftsmen, or industry is an indicator of the firm's institutional and legal structure, and is expected to convey information about the dualistic nature of the subcontracting relationship the firms are engaged in.

4.1.4. Use of formal credits at foundation (CRED)

The establishment's use of formal credits at foundation is included as an explanatory variable to control the effects of external resources from banks, government agencies, development funds, etc. In both provinces, for the most part equity capital rather than alternative sources of funds seems to be preferred, and use of equity capital consists of 88 percent of total capital sources at founding, while use of loans from private or public sources remains comparably minimal.

4.1.5. Proprietorship (RENT)

Whether production takes place in a rented facility, or under own property is an indicator about the firm's capital base as well as the continuity and permanence of production. RENT variable is represented by a dummy which takes the value 0 if the firm owns the facility, and 1 otherwise.

4.1.6. Legal status (STAT)

To test whether the legal form of the establishment has any effect on the subcontracting decision, legal status dummies are included as explanatory variables. The establishment may be family or individually owned, or may have a more complex ownership structure under incorporated, limited, or open liability.

4.1.7. Worker registration status (INSUR)

Workers' registration under a social security system directly affects the labor cost, and hence carries important information about the firm's incentives to subcontract work out or to engage in a subcontracting relationship with other firm(s) under the labor cost cutting motive. In the model, worker registration status is included as a dummy variable where the dummy takes the value 0 if the firm employs at least one unregistered worker, and 1 if all workers are registered.

4.1.8. Specialization (SPEC)

In addressing specialization (SPEC) in the analysis, the main idea is that firms outsource or subcontract out certain processes of a product which requires specialized technology because they do not possess that technology (e.g. machinery, and/or patents), and due to economies of scale, the subcontractor with specialized technology has relatively lower-cost means of carrying out that process (for example, see Watanabe, 1971). The firm with specialized technology for a certain process would have trained (or, skilled) workers for that specialized process; hence it would be less costly for the specialized firm to carry out that task. Therefore, other firms may tend to hire this firm for these specialized tasks. On the other hand, the parent firm wanting to specialize on core competencies such as innovation, design, or marketing, will subcontract out certain other steps of the manufacturing process requiring specialized technology, therefore they will be actively seeking for subcontractors possessing that specialized technology. Therefore, from both sides of the relationship, specialization is expected to have a positive effect on the probability of hiring a subcontractor, and working as a subcontractor.

4.1.9. Use of computer aided machinery (COMP)

In the analysis, the COMP variable (whether the firm uses computer-aided machinery for manufacturing, or not) is included as an indicator of, or a proxy for the use and possession of relatively advanced technology and the use of multi-purpose equipment (one of the firm level elements of flexible specialization, as indicated in Van Dijk, 1995). COMP is a dummy that captures the technology level used in production, and controls whether the firm uses modern or up-to-date technology versus relatively more labor-intensive, older technology machinery and equipment (e.g. semi-automatic machinery). Nevertheless, it must be kept in mind that in Denizli and Gaziantep, many establishments reported in the survey that although they use computer-aided machinery, it is usually second-hand and relatively old technology.

4.1.10. Quality certification (CERT)

Having a quality certificate provides a signal about the formal structure of the firm and is expected to reduce the transaction costs (or, more specifically search costs) faced by the firm in establishing subcontracting relationships. Holding a quality certificate, most notably the ISO9000 certificate, also points towards some kind of international activity by the establishment, since most export activity requires such certification.

4.1.11. Export activity (EXPORT)

Previous studies suggest that an important determinant of transaction costs is the size or thickness of the market: a thicker market increases the firm's probability to find suitable subcontracting partners and thus make subcontracting more viable in large markets. It has been argued that international trade increases the thickness of the market and increases the opportunities to engage in subcontracting (for example, McLaren, 2000). In the present model, international activity is measured by a dummy variable which takes the value 1 if the firm has export behavior and 0 otherwise.

4.1.12. Education criterion at hiring (CRIT)

Whether the firm considers the new worker's education as a top priority at hiring, or considers other factors such as on-the-job experience as well as family relations and acquaintances indicating to strong informal social ties can be an important indicator of the firm's skilled versus unskilled labor composition. In Denizli and Gaziantep, among the establishments surveyed, only 6 percent reported education as a criterion of top priority at hiring new workers, which gives clues about the human capital requirement of the production taking place in these two provinces.

4.1.13. Number of female employees (FEMALE)

To control for the effect of gender composition of the labor force on subcontracting decision, the number of female employees variable is used. Taymaz and Kılıçaslan (2005) argue that subcontracting is not a gender-neutral process, and relatively 'feminized' production tasks may be subcontracted out to small scale producers as female workers are paid lower wages, and they carry out more 'labor-intensive' tasks.

4.1.14. Required minimum level of education (EDUC)

Like the CRIT variable, EDUC variable carries information about the skill composition of the firm's labor force. Indeed, these two variables are complementary as they represent the necessary minimum human capital requirement of the production tasks carried out by the firm. The variable takes the value 0 if no formal education is required, 1 if elementary school, 2 if middle-high school, 3 if high school, and 4 if higher education is required at hiring.

4.1.15. Wage (WAGE)

Wage, or labor cost, is another important determining factor of subcontracting relationship in the dualistic approach. In the estimations, a dummy variable to represent the firm wage level with respect to legal minimum wage has been used;

the dummy takes the value 1 if the firm pays above the legal minimum, and 0 if the firm pays below or equal to the legal minimum. Similar to the SIZE variable, it is expected that WAGE variable has a positive coefficient in the using-subcontractor model, while a negative coefficient in the working as a subcontractor model.

4.1.16. Sector

The sub-sectoral dummies are included in the model to capture any possible effects of operating in various sub-sectors in textile industry on the firm's subcontracting decision. Production in different sub-sectors involves different number of steps and procedures, thus the tendency to offer or receive a subcontract by a firm may depend on which sub-sector the firm operates in.

4.2. Descriptive statistics

Table 2 and Table 3 present the relationship between the subcontracting behavior and the characteristics of textile firms in Denizli and Gaziantep used in the empirical model.[11] Firms in the no-subcontracting column (1) are those that are not in any kind of subcontracting relationship with other firms. Firms in the second column are those which work as a subcontractor only (work as a subcontractor but do not hire others as subcontractors), while those in the third column use subcontractors only (hire other firms as subcontractors, but they themselves do not work as subcontractors for others). Two-way contract column (4) represents the firms which work as subcontractors, and also hire others as subcontractors.

Table 2 depicts that working as a subcontractor (either working as a subcontractor only or two-way subcontracting) is more widespread in Denizli[12] (44 percent and 34 percent respectively). Gaziantep has mostly firms that either use subcontractors only (36 percent) or do not engage in any subcontracting relation (37 percent).

The common characteristics in both provinces are as follows. The oldest firms are the ones which engage in two-way subcontracting. This may be attributed to increased access to networks as firms get older. Firms with no subcontracting relations mostly use formal credits at foundation, register workers in social security system, have corporate structure rather than family or individual ownership, own

[11] Descriptive statistics and the empirical results are based on 434 observations from the survey. The original survey has 444 observations in total, however 10 observations are left out of the sample due to lack of answers to some of the questions by these establishments.

[12] Although not reported in the table, analyzing firms according to their size reveals interesting results for Denizli, where subcontracting is more frequent: among micro and small size firms, the majority work as a subcontractor only (55 percent of micro firms, 48 percent of firms with 10-24 workers, 42 percent of firms with 25-49 workers). Most of the medium sized firms (44 percent) use subcontractors only, and most of larger firms engage in two-way subcontracting (41 percent of firms with 100-249 workers and 62 percent of firms with 250+ workers).

the property, use computer aided machinery and use education criterion as the top priority at hiring. Taking these characteristics into account, one can say that firms with no subcontracting relations exhibit more formal characteristics, are more advanced technologically and tend to use more skilled workers. The firms that only work as subcontractors are the youngest ones, mostly renting the property, have a higher probability to use unregistered workers, and are less likely have quality certificates and engage in export activity. These attributes point to more unregulated or informal segments of the economy. Another interesting result that can be drawn from Table 2 is that in Denizli among the firms which use subcontractors only, a considerable majority (71 percent) pay workers above minimum wage. These firms also have a higher likelihood to be exporters in Denizli while in Gaziantep export activity is more prevalent among the firms which do not engage in any kind of a subcontracting relationship (the majority of these firms at 46 percent pay workers above minimum wage).

Descriptive statistics about the three other variables used in the model, namely the number of employees in the firm (represented by SMALLEST and LARGEST dummy variables), FEMALE (number of female workers in the firm) and EDUC (required minimum education level of workers at hiring) are provided separately in Table 3. The descriptive statistics indicate that most of the firms in Denizli and Gaziantep are micro (1-9 workers) or small size (either 10-24 or 25-49 workers) enterprises and comparably more firms in Denizli choose to hire female workers than those in Gaziantep. The survey results also indicate that majority of firms in almost all subcontracting categories in both provinces do not require any formal education at the time of hiring workers, but interestingly, 25 percent and 23 percent of firms with no subcontracting relations in Denizli and in Gaziantep respectively, require high school education at hiring.

Table 2
Descriptive Statistics for Textile Industry in Denizli and Gaziantep, by Subcontracting Behavior

Variable label	Description	(1) No subcontracting		(2) Working as a subcontractor, not using		(3) Using subcontractor(s), not working		(4) Two-way contract	
		Denizli	Gaziantep	Denizli	Gaziantep	Denizli	Gaziantep	Denizli	Gaziantep
AGE*	Firm age	3.25	3.03	2.77	2.80	3.32	3.24	3.37	3.37
		(0.89)	(1.10)	(1.02)	(1.22)	(1.04)	(1.21)	(1.02)	(1.12)
REGIS	Registration in chambers (%)	88	91	81	43	97	75	92	58
		(0.35)	(0.29)	(0.40)	(0.50)	(0.17)	(0.43)	(0.27)	(0.51)
CRED	Use of formal credits at foundation (%)	13	18	14	12	3	11	11	0
		(0.35)	(0.38)	(0.35)	(0.33)	(0.17)	(0.31)	(0.31)	(0.00)
RENT	Proprietorship (%)	25	22	60	78	29	48	48	68
		(0.46)	(0.42)	(0.49)	(0.42)	(0.46)	(0.50)	(0.50)	(0.48)
STAT	Legal status (%)	25	36	25	31	21	20	23	21
		(0.46)	(0.48)	(0.44)	(0.47)	(0.41)	(0.40)	(0.42)	(0.42)
INSUR	Worker registration status (%)	100	63	89	14	85	36	89	21
		(0.00)	(0.48)	(0.31)	(0.35)	(0.36)	(0.48)	(0.31)	(0.42)
SPEC	Specialization (%)	75	87	73	67	79	80	88	63
		(0.46)	(0.34)	(0.45)	(0.47)	(0.41)	(0.40)	(0.33)	(0.50)
COMP	Use of computer aided machinery (%)	50	59	49	27	44	32	42	47
		(0.53)	(0.49)	(0.50)	(0.45)	(0.50)	(0.47)	(0.50)	(0.51)
CERT	Quality certification (%)	13	17	5	4	21	8	15	5
		(0.35)	(0.37)	(0.21)	(0.20)	(0.41)	(0.28)	(0.36)	(0.23)
EXPORT	Export activity (%)	25	51	6	12	59	31	35	11
		(0.46)	(0.50)	(0.24)	(0.33)	(0.50)	(0.46)	(0.48)	(0.32)
CRIT	Education criterion priority at hiring (%)	13	16	0	6	6	6	2	0
		(0.35)	(0.36)	(0.00)	(0.24)	(0.24)	(0.24)	(0.12)	(0.00)
WAGE	Firms paying above legal minimum wage (%)	63	46	64	20	71	38	52	21
		(0.52)	(0.50)	(0.48)	(0.41)	(0.46)	(0.49)	(0.50)	(0.42)
S3211**	Spinning, weaving and finishing textiles (%)	63	43	29	14	15	15	14	16
		(0.52)	(0.50)	(0.45)	(0.35)	(0.36)	(0.36)	(0.35)	(0.37)
S3212	Manufacture of made-up textile goods, except wearing apparel (%)	25	0	61	10	65	2	71	0
		(0.46)	(0.00)	(0.49)	(0.31)	(0.49)	(0.15)	(0.46)	(0.00)
S3213	Knitting mills (incl. apparel) (%)	0	16	1	47	18	56	3	74
		(0.00)	(0.36)	(0.11)	(0.50)	(0.39)	(0.50)	(0.17)	(0.45)
S3214	Carpets and rugs (%)	0	38	2	12	0	24	0	11
		(0.00)	(0.49)	(0.15)	(0.33)	(0.00)	(0.43)	(0.00)	(0.32)
S3219	Manufacture of textiles nec (%)	13	3	7	16	3	2	12	0
		(0.35)	(0.18)	(0.26)	(0.37)	(0.17)	(0.15)	(0.33)	(0.00)
	Number of observations (% of total)	4	37	44	19	18	36	34	8

Notes: The figures are mean values. Standard deviations are in parentheses.
* A value of 3 corresponds to 8 years according to median values.
** Sub-sector 3211 is the reference sector.

Table 3

Size, Female Employment and Required Minimum Level of Education at Firms in Denizli and Gaziantep

	(1) No subcontracting		(2) Working as a subcontractor, not using		(3) Using subcontractor(s), not working		(4) Two-way contract	
	Denizli	Gaziantep	Denizli	Gaziantep	Denizli	Gaziantep	Denizli	Gaziantep
Number of observations	8	90	84	49	34	85	65	19
SIZE: Number of Employees*								
1-9 (SMALLEST)		0.20	0.39	0.49	0.35	0.41	0.23	0.37
		(0.04)	(0.05)	(0.07)	(0.08)	(0.05)	(0.05)	(0.11)
10-24	0.38	0.21	0.33	0.31	0.15	0.20	0.34	0.32
	(0.18)	(0.04)	(0.05)	(0.07)	(0.06)	(0.04)	(0.06)	(0.11)
25-49	0.13	0.29	0.15	0.10	0.21	0.15	0.15	0.16
	(0.13)	(0.05)	(0.04)	(0.04)	(0.07)	(0.04)	(0.05)	(0.09)
50-99	0.25	0.11	0.04	0.10	0.21	0.11	0.08	0.11
	(0.16)	(0.03)	(0.02)	(0.04)	(0.07)	(0.03)	(0.03)	(0.07)
100-249	0.13	0.13	0.04		0.09	0.08	0.08	0.05
	(0.13)	(0.04)	(0.02)		(0.05)	(0.03)	(0.03)	(0.05)
250+ (LARGEST)	0.13	0.06	0.05			0.05	0.12	
	(0.13)	(0.02)	(0.02)			(0.02)	(0.04)	
FEMALE: Number of Female Employees*								
0	0.13	0.58	0.44	0.65	0.38	0.68	0.23	0.58
	(0.13)	(0.05)	(0.05)	(0.07)	(0.08)	(0.05)	(0.05)	(0.12)
1-9	0.38	0.30	0.27	0.24	0.18	0.24	0.23	0.26
	(0.18)	(0.05)	(0.05)	(0.06)	(0.07)	(0.05)	(0.05)	(0.10)
10-24	0.25	0.06	0.18	0.06	0.18	0.07	0.20	0.11
	(0.16)	(0.02)	(0.04)	(0.03)	(0.07)	(0.03)	(0.05)	(0.07)
25-49		0.04	0.08	0.04	0.09	0.01	0.09	0.05
		(0.02)	(0.03)	(0.03)	(0.05)	(0.01)	(0.04)	(0.05)
50-99	0.25				0.09		0.12	
	(0.16)				(0.05)		(0.04)	
100-249		0.02			0.09		0.03	
		(0.02)			(0.05)		(0.02)	
250+			0.02				0.09	
			(0.02)				(0.04)	
EDUC: Required Minimum Level of Education*								
None	0.75	0.37	0.83	0.71	0.65	0.55	0.74	0.63
	(0.16)	(0.05)	(0.04)	(0.07)	(0.08)	(0.05)	(0.05)	(0.11)
Elementary sch.		0.19	0.07	0.18	0.12	0.24	0.02	0.32
		(0.04)	(0.03)	(0.06)	(0.06)	(0.05)	(0.02)	(0.11)
Middle high sch.		0.21		0.04	0.15	0.08	0.11	
		(0.04)		(0.03)	(0.06)	(0.03)	(0.04)	
High school	0.25	0.23	0.10	0.06	0.09	0.13	0.14	0.05
	(0.16)	(0.04)	(0.03)	(0.03)	(0.05)	(0.04)	(0.04)	(0.05)

Note: Standard deviations in parentheses.

*Share of firms (number of firms divided by the number of all firms in the province).

4.3. Estimation results

Table 4 reports the results of our estimations. Different specifications of the model have been estimated and the results have been very similar, confirming the robustness of the results. Out of these different specifications, the results from two are taken into consideration: Specification 1 (as reported in Table 4) which includes all explanatory variables and Specification 2 which includes only the explanatory variables whose coefficients were found to be statistically significant in Specification 1[13]. The coefficients of SMALLEST, STAT and CERT were found to be statistically insignificant in all estimations (working as a subcontractor in Denizli, in Gaziantep, and in full sample; using a subcontractor in Denizli, in Gaziantep, and in full sample), consequently, these variables are not included in Specification 2. Since the results from Specification 1 and Specification 2 are very similar for the remaining variables, in the following, our interpretations are based on Specification 1 (Table 4).

As 21 explanatory variables including numerous categorical variables are used in this study, multicollinearity was checked first by examining the correlation coefficients between all variables, second the variance inflation factors (VIFs) and the condition numbers[14]. Of all the correlation coefficients, only two are greater than 0.5, the maximum of which is 0.66. The VIFs are all smaller than the acceptable critical value of 10 (Hill and Adkins, 2001). The highest VIF is 3.00 (average 1.61) for the full sample of both provinces, 2.81 (average 1.98) for the case of Denizli and 2.67 (average 1.54) for the case of Gaziantep. The condition numbers are also found to be very low: 4.36 for the whole sample, 4.14 for Denizli and 4.54 for Gaziantep, all lower than the acceptable value of 10 (Hill and Adkins, 2001). These findings indicate that there is no multicollinearity problem in the model.

Taking into account the fact that a firm may decide to establish a subcontracting relation jointly with other decisions like the number of workers, and export activity, nevertheless one must be cautious in interpreting the estimated coefficients, and treat them as reflecting controlled associations between the dependent and the independent variables, rather than causal relations.

[13] Results from Specification 2 are available from authors upon request.

[14] Correlation coefficient matrices and collinearity diagnostics (VIFs) are available from authors upon request.

Table 4

Bivariate Probit Estimation Results (Marginal Effects)

Dependent Variable	Working as a subcontractor			Using subcontractor		
	Full sample	Denizli	Gaziantep	Full sample	Denizli	Gaziantep
SMALLEST	-0.07	-0.04	-0.06	0.09	0.09	0.07
	(0.07)	(0.08)	(0.06)	(0.07)	(0.11)	(0.09)
LARGEST	0.17	0.17***	-0.22***	-0.08	-0.39***	0.22
	(0.13)	(0.04)	(0.03)	(0.13)	(0.14)	(0.18)
AGE	0.02	0.00	0.02	0.05**	0.09*	0.04
	(0.03)	(0.03)	(0.02)	(0.03)	(0.05)	(0.03)
REGIS	-0.23***	-0.07	-0.21***	0.22***	0.13	0.24***
	(0.08)	(0.08)	(0.08)	(0.07)	(0.13)	(0.09)
CRED	0.16	0.11*	0.09	-0.10	-0.21*	0.00
	(0.10)	(0.06)	(0.11)	(0.08)	(0.12)	(0.11)
RENT	0.29***	0.16***	0.19***	0.01	0.00	0.05
	(0.06)	(0.06)	(0.06)	(0.06)	(0.11)	(0.08)
STAT	0.05	0.01	0.07	-0.10	-0.10	-0.11
	(0.07)	(0.07)	(0.06)	(0.06)	(0.11)	(0.08)
INSUR	-0.11	0.08	-0.14**	-0.01	-0.04	0.05
	(0.09)	(0.11)	(0.07)	(0.07)	(0.13)	(0.09)
SPEC	-0.11	0.05	-0.14**	0.05	0.12	-0.01
	(0.07)	(0.07)	(0.07)	(0.07)	(0.11)	(0.08)
COMP	0.04	0.05	0.04	-0.16***	-0.28***	-0.10
	(0.07)	(0.06)	(0.06)	(0.06)	(0.09)	(0.08)
CERT	-0.15	-0.26	-0.004	0.05	0.19	-0.03
	(0.11)	(0.16)	(0.11)	(0.08)	(0.14)	(0.11)
EXPORT	-0.27***	-0.25***	-0.07	0.25***	0.43***	-0.01
	(0.08)	(0.10)	(0.09)	(0.08)	(0.09)	(0.12)
FEMALE	0.07**	0.04	0.07**	0.03	0.04	-0.01
	(0.03)	(0.03)	(0.04)	(0.03)	(0.04)	(0.04)
CRIT	-0.17	-0.55***	0.06	-0.15	0.02	-0.21*
	(0.14)	(0.18)	(0.15)	(0.11)	(0.26)	(0.12)
EDUC	-0.05*	-0.02	-0.07**	-0.01	-0.01	0.01
	(0.03)	(0.03)	(0.03)	(0.03)	(0.05)	(0.04)
WAGE	-0.23***	-0.12**	-0.16***	-0.02	-0.04	0.00
	(0.06)	(0.05)	(0.05)	(0.05)	(0.09)	(0.07)
DENIZLI	0.48***			0.12		
	(0.08)			(0.09)		
S3212	0.10	0.02	0.39*	0.22***	0.34***	-0.01
	(0.09)	(0.08)	(0.23)	(0.08)	(0.10)	(0.22)
S3213	-0.23***	-0.35	-0.12*	0.47***	0.44***	0.41***
	(0.09)	(0.23)	(0.07)	(0.07)	(0.08)	(0.10)
S3214	-0.14	0.17***	-0.10	0.06	-0.55***	0.10
	(0.11)	(0.03)	(0.07)	(0.10)	(0.04)	(0.11)
S3219	0.11	0.01	0.19	0.19*	0.33**	-0.10
	(0.13)	(0.12)	(0.16)	(0.11)	(0.14)	(0.16)
Corr	-0.48***	-0.36***	-0.42***			
	(0.10)	(0.15)	(0.14)			
Number of observations	434	191	243			
chi^2	252.59	1291.48	1522.49			

Note: Robust standard errors in parentheses. *, **, ***: significant at 10, 5, and 1 % respectively.

Two equations (where the dependent variable is "working as a subcontractor" and "using a subcontractor") were jointly estimated for each sample. Correlation of errors (Corr) and $\chi 2$ for H_0: $\beta j = 0$ (chi^2) in the first three columns belong to the jointly estimated equations.

The findings from the econometric analysis (marginal effects) are reported in Table 4. The specification of the model is jointly highly significant for all estimations: The χ^2 statistics of 252.59, 1291.48 and 1522.49 for the full sample, Denizli sample and Gaziantep sample respectively indicate rejection of the null hypothesis that all slope coefficients are zero at the 1 percent level (see Table 4). The null hypothesis of independence of the two subcontracting decisions (working as and using a subcontractor) is also rejected: correlation of errors (-0.48, -0.36 and -0.42 for the full sample, Denizli sample and Gaziantep sample respectively) are significant at 1 percent level (Table 4). The negative signs of the correlations denote that unobserved factors that increase a firm's probability to work as a subcontractor decreases its probability to use a subcontractor, as expected.

In the subsections below, although the estimations are implemented jointly, we nonetheless interpret the results from the regressions separately under two subheadings: working as a subcontractor as a dependent variable, and using (a) subcontractor(s) as a dependent variable.

4.3.1. Dependent variable: Working as a subcontractor

In the estimations, the coefficient of the dummy representing smallest firms, SMALLEST, is found to be negatively associated with working as a subcontractor, although insignificant in all samples. In contrast, the coefficient of LARGEST, the dummy representing largest firms, is found to be significantly negative in Gaziantep, yet significantly positive in Denizli. That is, in Gaziantep, large firms are less likely to work as subcontractors, but in Denizli the outcome that large firms tend to work as subcontractors is novel. This outcome is in line with the 'flexible specialization approach' as it has been argued that in subcontracting relationships production costs are cut by taking advantage of the outside supplier's economies of scale. Another possible explanation for large firms being subcontractors is that large firms in Denizli tend to accept large outsourcing tasks from international and/or multi-national firms, and they are likely to share these tasks among each other by taking advantage of efficient networking, rendering large firms as subcontractors to each other. In Gaziantep, on the other hand, large firms do not tend to work as subcontractors; the larger the firm size is, the lower is the probability to work as a subcontractor in Gaziantep, an outcome consistent with the dualistic economy approach to subcontracting.

Despite prior expectations drawn from the descriptive statistics, for all samples, being a young firm does not necessarily increase the probability of working as a subcontractor, which indicates that firm age is not a factor in the likelihood to work as a subcontractor, and a firm may work as a subcontractor regardless of the number of years it has been active, in contrast with the transaction cost theory that age is an important factor in subcontracting decision. For both

provinces, if the firm is registered to the chamber of commerce or industry, the probability to work as a subcontractor is lower, but only in Gaziantep this probability is significant. That is, particularly in Gaziantep, as expected in the dualistic approach to subcontracting, we can interpret this result that if the firm is not registered in the chambers and remains unregistered (more likely in order escape or circumvent certain rules and regulations to keep cost of production low), it is more likely to work as a subcontractor.

The method of financing the foundation of the firm is found to be irrelevant in the probability of working as a subcontractor (only in Denizli, at a low 10 percent significance level, a firm is more likely to work as a subcontractor if the firm relied on outside sources of financing other than owner's equity at foundation). On the other hand as was anticipated, if the firm rents the facilities for operation and does not own the property, the firm is more likely to work as a subcontractor in both provinces. Renting the facilities points to a more temporary operation as well as to capital deficiency. Therefore working as a subcontractor can be associated with financial constraints. Furthermore, in order to understand the growth potential under working as a subcontractor, in the survey firms were asked whether they have had any new investment opportunities in the current period. Among the firms which work as subcontractors in the whole sample, 73 percent answered that they have not had any new opportunities for investment in the current period.[15] The incidence of not having had any opportunities for new investment is the highest among the firms which work as subcontractors, compared to the whole sample. These two outcomes together point out that firms which work as subcontractors, more so than the general population of firms in the survey, do not have adequate financial capacities to accumulate necessary capital in order to grow, and to become fully own-account firms.

The coefficient of the STAT variable is found to be insignificant in all estimations regarding 'working as a subcontractor': the legal status of the firm, i.e. whether a firm is family/self-owned or incorporated/limited/open/foreign owned/other type is not statistically associated with the decision to work as a subcontractor. This outcome negates the dualistic view in Denizli and Gaziantep that predominantly small scale, family-owned or self-employed businesses work as subcontractors.

The INSUR variable has a negative sign as expected and it is significant only in Gaziantep considering the probability to work as a subcontractor. What the

[15] A chi-square test was conducted in order to test the null hypothesis that working as a subcontractor and having new opportunities for investment in the current period are independent. The test statistic was found to be 9.8, rejecting the null hypothesis at 1 percent level for the whole sample. Therefore this test implies that new investment opportunities of the firms that work as subcontractors and those of the remaining firms are statistically significantly different.

negative and significant sign implies is that in Gaziantep, firms which employ at least one unregistered worker have a higher probability to work as a subcontractor. With this result, in the case of Gaziantep, working as a subcontractor can be associated with employing informal or unregistered workers, and concurs with the dualistic view of subcontracting.

In our regressions, for the Denizli sample, the coefficient of SPEC variable for probability of working as a subcontractor is positive, agreeing with the flexible specialization approach to subcontracting. However this relationship is statistically insignificant. For the Gaziantep sample, there is a negative and statistically significant relationship between specialization and working as a subcontractor, implying that firms that do not specialize in any in any task or process have a higher probability to work as subcontractors (i.e. the tasks they offer do not necessitate any specialized technology or skill), contrasting the hypothesis of flexible specialization. Furthermore, possessing and using computerized machinery is not a significant factor in the likelihood of working as a subcontractor. In that sense, especially for the Gaziantep sample, the hypothesis of flexible specialization that firms with specialized technology tend to work as subcontractors does not hold.

The negative sign of the CERT variable for all samples indicates that firms holding no quality certifications tend to have a higher probability to work as subcontractors, however this relationship is found to be insignificant.

In terms of export activities, we find that particularly in Denizli, firms that engage in exports are less likely to work as a subcontractor, as predicted by transaction cost theory. This result is in agreement with Kimura (2002) who has also concluded that being an exporter reduces the likelihood of working as a subcontractor as firms that work as subcontractors tend to de-internalize exporting activities.

In Gaziantep, in line with prior expectations and consistent with the findings of Taymaz and Kılıçaslan (2005) for the Turkish textile industry, firms that employ a higher number of female workers have a significantly higher probability of working as a subcontractor. This implies that in Gaziantep, working as a subcontractor involves relatively more labor-intensive, feminized tasks. This might be either because women are less-skilled and inclined to work in more labor-intensive tasks, particularly in the textile industry, or because women are more willing to accept worse labor conditions and irregular occupation for economic and/or cultural reasons. For Denizli, the variable CRIT and the probability to work as a subcontractor have a negative relationship, implying that firms which do not consider education as a top priority at hiring new workers have a higher probability of working as a subcontractor. This result is remarkable as it points out that firms working as subcontractors hire new workers following other criteria such as informally gained experience and tight social ties. On the other hand, in Gaziantep,

required minimum level of education of workers in a firm is found to be negatively associated with the probability to work as a subcontractor, implying that the lower the required minimum level of education of workers in a firm is, the higher is the firm's probability to work as a subcontractor. These two outcomes on workers' education requirement from Denizli and Gaziantep point to the association of using unskilled workers with low education level and the probability of working as a subcontractor.

In line with our prior expectations from the dualistic approach, the WAGE dummy has a negative coefficient in the working as a subcontractor model for both provinces. That is, paying a wage lower than or equal to the legal minimum increases the probability of working as a subcontractor.

Lastly, the coefficient of the DENİZLİ dummy has a positive sign in estimations where both working as and using a subcontractor are dependent variables, but the relationship is significant only for the probability of working as a subcontractor. This result suggests that firms in Denizli have a significantly higher probability to engage in subcontracting relations than the firms in Gaziantep. Although in both provinces majority of the firms are motivated by competition, our survey revealed a higher degree of cooperation among the firms in Denizli than those in Gaziantep: 37 percent of all firms surveyed in Denizli state that they favor cooperation over competition in terms of conducting relations with other firms in the sector, including sharing technological know-how to some extent, while this rate is at 22.6 percent in Gaziantep. This cooperation factor (be it actual or perceived) attests to a more favorable business climate for collaboration and networking in Denizli's textile industry compared to that in Gaziantep. As this cooperation factor has not been added as an explanatory variable to our empirical examination, one may consider it as an exogenous factor in explaining the significantly higher degree of subcontracting intensity in Denizli.

4.3.2. Dependent variable: Using (a) subcontractor(s)

Unlike in the case of working as a subcontractor, the significance of the relationships between the explanatory variables and the probability to hire (a) subcontractor(s) is rather weak. In particular, SMALLEST, CRED, RENT, STAT, INSUR, SPEC, CERT, FEMALE, CRIT, EDUC and WAGE factors do not have any significant effect on the likelihood to hire (a) subcontractor. Still, some factors such as LARGEST, AGE, REGIS, COMP and EXPORT present some significance in the probability to use (a) subcontractor(s). Especially in Denizli, largest firms with 250 or more workers are less likely to use outside contractors, as they may prefer internalizing all production processes in-house. Furthermore, especially for the full sample we observe that the more established and older firms tend to have a higher probability to hire (a) subcontractor(s), which is in agreement with the

transaction cost theory, which postulates that the more established and more mature the firm is, the lower are the firm's search costs, and therefore the higher will be the likelihood of this firm to find and hire suitable subcontractors.

We observe that another significant factor in the probability to use (a) subcontractor(s) is the firm's registration status to chambers. This is an interesting result which confirms that in particular in Gaziantep, firms that are formally established by registration to chambers have a higher probability to use subcontractors. Another interesting outcome is related to the COMP variable. Particularly in Denizli, firms which do not possess and use computer-aided machinery are more likely to use subcontractors, a result which partly corroborates with the flexible specialization theory to subcontracting that a firm would subcontract out the parts of production which require specialized and higher technology machinery. Lastly, as expected from the transaction cost theory and as documented in the previous empirical literature, firms engaged in export activities have a higher probability to use subcontractors, as these firms choose to be vertically integrated.

Regarding the sub-sectoral distribution of subcontracting patterns, we interpret the outcomes of the regressions concerning the probability of working as a subcontractor and using (a) subcontractor simultaneously. It is observed that in Denizli firms that are in the manufacture of made-up textile goods except wearing apparel (S3212-mainly home textile, bed linens, towels, etc.) have a higher probability to use a subcontractor compared to those in the reference sector (S3211-spinning, weaving and finishing textiles). Firms that are in knitting and apparel are less likely to work as a subcontractor in Gaziantep, and more likely to hire subcontractors in both provinces, compared to those in the reference sector. Firms in manufacture of carpets and rugs (including weaving warp and sizing/slashing activities) and are more likely to work as subcontractors but less likely to use a subcontractor in Denizli[16]. In Gaziantep, working in carpets and rugs industry does not significantly affect the probability to work as or use subcontractors. Overall, our estimation results show that particularly in Gaziantep, the tendency to work as a subcontractor is relatively better explained by firm characteristics than the tendency to hire (a) subcontractor(s) is (in Gaziantep, the probability to hire (a) subcontractor(s) is found to be associated only with registration to chambers). In Denizli, certain elements of flexible specialization and transaction cost approaches to subcontracting are associated with the tendency to hire a subcontractor (such as age, export, and the use of computer-aided machinery), but no element of the dualistic economy approach.

[16] However, we must be careful in interpreting this result, as only 1 percent of all firms in Denizli are in carpets and rugs industry (they are only engaged in weaving warp and sizing/slashing, which is a subsidiary industry to carpets and rugs).

Although the subcontracting literature does not explicitly relate informality with subcontracting behavior, except for Beneria (1989) who suggests that subcontracting allows the shift of employment and production towards more informal segments of the economy due to the desire to escape government regulations on labor and other market transactions, we can associate two seperate strands of literature in economics, the literature on the *dualistic approach to subcontracting* and the literature on informality, as the dualistic approach chiefly deals with the cost reduction motive for subcontracting production out, while being and staying informal is primarily related to reducing production costs. In that sense, we can relate 'working as a subcontractor' and informality (in our case, employing informal or unregistered workers, and thus offering a low-cost production to the clients, and being unregistered to chambers) under the dualistic approach. Accordingly, we can ask the question whether being informal raises the probability of working as a subcontractor, or not. Emphasizing the dualistic nature of developing economies, Bromley (1978) characterizes informal sector activities by ease of entry, reliance on indigenous resources, family ownership of enterprises, small scale of operation, labor intensive and adapted technologies, skills acquired outside the formal school system and unregulated and competitive markets. Correspondingly, according to our estimations, in Gaziantep working as a subcontractor is mainly associated with not being registered to chambers of commerce or industry, renting the facilities for manufacturing, employing unregistered workers and women, a low minimum level of education requirement at hiring, and paying a wage lower than or equal to the legal minimum wage. For Gaziantep we also found that large firms do not tend to work as subcontractors. Finally, our results suggest that firms which tend to work as subcontractors do not specialize in a certain task or a process, unlike predicted by the flexible specialization approach to subcontracting. Our survey and estimation results for Gaziantep corroborate that subcontracting relationships in this province convey some informality and dualistic economy characteristics. Overall, these estimation results suggest that in Gaziantep, subcontracting relationships are primarily motivated by cost cutting and capacity considerations, and not by transaction cost, flexible specialization or technological considerations. Therefore one can conclude that in Gaziantep the traditional, dualistic nature of subcontracting relationships stands out more than the other explanations or approaches to subcontracting.

In Denizli, on the other hand, subcontracting relationships are more complex and evolved. In Denizli, components from all dualistic, transaction cost, as well as flexible specialization approaches to subcontracting can be detected, unlike in Gaziantep where the traditional dualistic nature of subcontracting is prominent. In Denizli, one cannot affirm that one approach to subcontracting is more dominant than the other.

5. Conclusion

In the present study, subcontracting behavior of the firms in textiles sector in Denizli and Gaziantep provinces based on specific firm characteristics has been estimated, and part of the results from the estimations agrees with the previous literature. In addition to using the explanatory variables as suggested by the previous literature, some novel and important indicators of firm characteristics that did not appear in the previous studies were also included in this study, such as proprietorship, use of formal credits at foundation, workers' registration status, firm's registration status, formal quality certificates, use of computer aided machinery, workers' education level, and education criteria at hiring. Based on our estimations, particularly in Gaziantep, firms which display some of the informal economy traits (for example not being registered in chambers of commerce or industry, employing unregistered workers, having a low required minimum level of education at hiring new workers) have a higher probability to work as a subcontractor, and subcontracting relationships are primarily motivated by cost-cutting and capacity considerations as claimed by the traditional dualistic economy approach. In Denizli, on the other hand, subcontracting relations are more complex and evolved, exhibiting components not only from dualistic economy approach, but also from flexible specialization, and transaction cost approaches.

Nevertheless some common elements in Gaziantep and Denizli can be observed: in both provinces, firms which have deficiency in capital, and thus have to rent the facilities for carrying out production, have a higher probability to work as subcontractors. Furthermore, according to the survey results, the firms which have the lowest probability to engage in new investment are those which work as subcontractors, only. These two outcomes indicate that subcontractors in these provinces do not have opportunities to grow and become fully own-account firms. This is in contrast with the view that subcontracting relations help enhance small enterprises.

Our estimation results also show that in both provinces the decision to work as a subcontractor is relatively more associated with firm-specific characteristics than the decision to hire (a) subcontractor(s), and we cannot affirm whether one particular approach to subcontracting stands out in explaining the decision to hire (a) subcontractor(s) in the textile industry in Denizli and Gaziantep (nonetheless we link certain components of flexible specialization and transaction cost approaches to the tendency to hire (a) subcontractor(s) in Denizli).

As can be deduced from the survey and estimation results, subcontracting relations in Gaziantep are primarily motivated by cost reduction and capacity limits associated with capital deficiencies, unskilled, female and unregistered labor, low wages, and small scale of operation. Such traditional subcontracting relations supported by the dualistic nature of the economy and motivated by economizing on

costs do not necessarily lead to higher collective efficiency and growth, mainly because the parent firm tends to shift the burden of the risk and costs to the subcontractor (Taymaz and Kılıçaslan, 2005), and the subcontractor tends to accept this arrangement as it alleviates the obstacles against survival and also maintains a steady flow of work to fill capacity. On the other hand, in Denizli, subcontracting relations involve motivations beyond capacity and cost-cutting factors, and the dualistic nature of subcontracting relations is not as dominant as in Gaziantep. Acknowledging that inter-firm and subcontracting relations evolve along with an economy's development level, one can say that subcontracting relationships are relatively more advanced in Denizli than in Gaziantep, demonstrating that in two different districts in the same industry and in the same country, one can observe different tendencies in terms of subcontracting. In this sense, if subcontracting relations are expected to play a positive role in regional development, they can also be conducive to identifying the impediments to growth and development in a specific region[17]. Correspondingly, while in Gaziantep ameliorating working conditions in the textile industry (for example wages and the informal status of the workers) and reducing the size of the informal sector is paramount, in Denizli strengthening networks across firms to enhance collective efficiency and flexibility takes precedence. In that sense, while improving the enforcement of existing social security laws to oversee the well-being of workers in the textile industry in Gaziantep remains to be a priority, in Denizli further incentives to the firms towards using, generating or transferring new technology through R&D should be fostered through government agencies such as the Scientific and Technological Research Council of Turkey. As firms are encouraged to specialize in various tasks with specific technological capabilities with such incentives, they will be more likely to interact with each other under (horizontal or vertical) subcontracting relationships and form well-functioning networks or clusters to get advantage of collective efficiencies and flexibilities. What this result points out is that regional economic development and incentive policies geared towards SMEs cannot be uniform across regions at the industry level, and they need to reflect information about the current development level of a region, and need to be tailored according to the specific development trajectory of that region.

[17] We thank the anonymous Reviewer for pointing out that in the development of a region, not only economic factors but also archaic cultural and social factors are essential. However these factors are beyond the scope of this study and require further research.

Appendix

Table A1
Detailed Description of the Variables

Variable label	*Description*	*Underlying theoretical foundation*
SMALLEST	Dummy for smallest firms (1: firms with 1-9 employees; 0: others)	Dualistic approach
LARGEST	Dummy for largest firms (1: firms with 250 or more employees; 0: others)	Dualistic approach
AGE	Firm age (1: one year; 2: 2-5 years; 3:6-10 years; 4: 11-20 years; 5: 21 or more years)	Transaction costs approach
REGIS	Registration in chambers (0: no; 1:yes)	Dualistic approach
CRED	Use of formal credits at foundation (0: owner's equity; 1: any other source of funds used)	Dualistic approach
RENT	Proprietorship (0: own; 1: rented)	Dualistic approach
STAT	Legal status (0: family or individually owned company; 1: incorporated; limited, open, foreign owned or other type of company)	Dualistic approach
INSUR	Worker registration status (All of the workers are registered, 0: no; 1:yes)	Dualistic approach
SPEC	Specialization (0: no; 1: yes)	Flexible specialization approach
COMP	Use of computer aided machinery (0: no; 1: yes)	Flexible specialization approach
CERT	Quality certification (0: no; 1: yes)	Transaction cost approach
EXPORT	Export activity (0: no; 1: yes)	Transaction cost approach
CRIT	Education criterion top priority at hiring (0: no; 1: yes)	Flexible specialization approach
FEMALE	Number of female employees (1: 0; 2: 1-9; 3: 10-24; 4: 25-49; 5: 50-99; 6: 100-249; 7: 250 or more)	Dualistic/Flexible specialization approach
EDUC	Required minimum level of education (0: none; 1: elementary school; 2: middle high school; 3: high school; 4: higher education)	Flexible specialization approach
WAGE	Wage level relative to legal minimum wage (0: legal minimum wage or lower; 1: above legal minimum wage)	Dualistic approach

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Özet

Taşeronluk ve firma özellikleri: Türkiye örneğinde iki yerel sanayi odağından bulgular

Bu çalışmada Denizli ve Gaziantep illerinde tekstil sektöründe üretim yapan firmalar arasındaki alt sözleşme ya da taşeronluk ilişkileri ele alınmaktadır. Denizli ve Gaziantep illeri, Türkiye'de ihracata dayalı büyüme stratejilerinin benimsenmesi ile birlikte 1990'lı yıllarda ortaya çıkan yeni sanayi odakları arasındadır. Bu çalışmada uygulanan ampirik analiz, her iki ilde yer alan firmaların yöneticileriyle yüz yüze görüşmeler sonucu elde edilen özgün veri setine dayanmaktadır. Elde edilen sonuçlara göre Gaziantep'te taşeronluk ilişkileri büyük ölçüde ekonominin ikili, geleneksel yapısına bağlı olarak ortaya çıkmaktadır. Denizli'de ise bu ilişkiler daha karmaşık ve gelişmiş olup firmalar arasındaki ağ iletişimini ve ortaklaşa verimlilik kazanımlarını kapsamaktadır.

Anahtar kelimeler: Taşeronluk, yeni sanayi odakları, tekstil sektörü, iki değişkenli probit model, Türkiye.

JEL kodları: C35; D21; L24; L67