Akdeniz İ.İ.B.F. Dergisi (27) 2013, 77-98

THE INTERRELATIONSHIP BETWEEN DOMESTIC SALES AND EXPORT: THE CASE OF TURKISH MANUFACTURING SECTOR 1996-2010

YURTİÇİ SATIŞLAR VE İHRACAT ARASINDAKİ KARŞILIKLI İLİŞKİ: TÜRKİYE İMALAT SEKTÖRÜ ÖRNEĞİ 1996-2010

Cemil ÇİFTÇİ[1]

Dilek DURUSU ÇİFTÇİ[2]

ABSTRACT

The purpose of this study is to investigate the interrelationship between domestic sales and export sales, and their joint determinants, in Turkey. To this end, the two-stage least square analysis is applied to the panel data of the Turkish manufacturing sector for the period 1996-2010. We found a statistically significant relationship between domestic and export sales. Results indicate that R&D expenditure is the most important factor affecting export sales, and advertising expenditure has a negative effect on export sales. In addition, general administrative expenditure was determined as the crucial factor in both domestic and export sales.

Keywords: *Manufacturing, R&D, advertising and marketing, domestic and export sales*

ÖZET

Bu çalışmanın amacı, Türkiye'de yurtiçi satışlar ile ihracat arasındaki karşılıklı ilişkiyi ve bu değişkenlerin ortak belirleyicilerini incelemektir. Bu doğrultuda, Türkiye imalat sektöründe 1996-2010 dönemi panel verileri için iki aşamalı en küçük kareler yöntemi uygulanmıştır. Analiz sonucunda, yurtiçi satışlar ile ihracat arasında istatistiksel olarak anlamlı bir ilişki bulunmuştur. Sonuçlar ihracat satışlarını etkileyen en önemli faktörün Ar-Ge harcamaları olduğunu ve reklam harcamalarının ihracat satışları üzerinde negatif bir etkiye sahip olduğunu göstermektedir. Ayrıca, genel yönetim giderlerinin hem yurtiçi hem de ihracat satışlarının belirlenmesinde çok önemli bir faktör olduğu belirlenmiştir.

A***nahtar Kelimeler:*** *İmalat sanayii, Ar-Ge, reklam ve pazarlama, yurtiçi ve ihracat satışları*

[1] Pamukkale Üniversitesi, İktisadi ve İdari Bilimler Fakültesi, İktisat Bölümü, Yrd. Doç. Dr.
[2] Pamukkale Üniversitesi, İktisadi ve İdari Bilimler Fakültesi, Uluslararası Ticaret ve Finansman Bölümü, Arş. Gör.

1. Introduction

Upon the success of export-oriented policies for developed economies, such as Germany and Japan, in the post second world war period, many developing countries have shifted to open-economy regimes in order to achieve a greater level of economic development in the post 1980 era. Subsequently, those domestic firms which started to compete in foreign markets in these countries faced new challenges, such as different consumer tastes and habits, visible or invisible trade barriers, and intense competition. To cope with these, firms started to allocate more resources (in all senses) to R&D and innovations, skilled labor and management, technology, advertising, marketing and distribution channels, etc.

Many studies in the literature have used firm-level and sectoral data to analyze the role of internal factors, such as R&D, firm-size, marketing-advertisement activity and capital intensities, and of external factors such as exchange rates and foreign gross national product on exporting and export performance, on domestic and export sales. However, there is no overall consensus on the exact effect of these factors. In addition, results also vary according to sectors and countries, and majority of these studies analyzed firms in developed countries (Zou & Stan, 1998; Sousa, Martínez-López & Coelho 2008). Tybout (2000) argued that the manufacturing sectors of developing countries underperform for the following reasons; (1) markets in developing countries tolerate survival of inefficient firms, which results in great variations in big productivity across firms; (2) markets in many developing countries have imperfect market structure, which causes inefficient pricing; (3) most firm are small and unwilling or unable to grow, and are therefore unable to benefit from scale economics. Firms encounter high fixed costs when entering export markets (Melitz, 2003), for activities such as identifying potential target markets, developing distribution networks, and adapting their products to the different regulations and tastes of other countries. Furthermore, firms in developing countries have more financial restrictions than those in developed countries. Financial limitations increase liquidity constraints of firms and frequently decrease the ability to finance export cost (Chaney, 2005).[3] Therefore, the determination of the determinants of the inter-relationship between domestic sales and export sales, and their joint determinants can provide a useful guide for firms and policy makers, especially for those in developing countries.

With the exception of Salomon and Shaver (2005) and Snigh (2009), domestic sales and export sales were analyzed in isolation in most studies in the literature. However, both domestic and export sales enter the profit function simultaneously. Exporting is not only important for scale economies and gaining monopoly power, but also there is an

[3] Perhaps that is why financial development has a positive effect on the level of exports (Becker et al., 2013; Bellone et al., 2010).

interrelationship between export and domestic sales, which allows firms some degree of leverage. That is, firms whose domestic sales contract can compensate their sales shortage by enhancing their exports, or vice versa. Voyvoda & Yeldan (2001) and Gunay et al. (2005) asserted that openness had a very little effect on either competitiveness or on profit margins in the manufacturing sector. This situation lead us to assume that there is an interrelationship between domestic and export sales, and Turkish manufacturing sector utilize from exporting –usually- only as a substitute of domestic sales. Therefore, in this paper, we simultaneously aim to analyze the effects of R&D, advertising, marketing and distribution, and general administrative expenditures on export and domestic sales.

In this study, we analyze the interrelationship between export and domestic sales at the sector-level data. [4] By assumption, sectors that penetrate foreign markets[5] need a high level of competitiveness, and also relatively advanced technology. In this respect, R&D, marketing and advertisement expenditures and general administrative expenditures in manufacturing industry must simultaneously play an important role in determination of domestic and export performance of firms. In addition, identifying the determinants of the interrelationship between export and domestic sales can be a useful guide not only for firms, but also for guiding government policy-making.

We therefore investigate the interrelationship between export and domestic sales and the effects of internal and external factors on the Turkish manufacturing sector's sales for the period of 1996-2010. We use two-stage least squares (2SLS) with fixed effects and estimate two equations. Our dependent variable is export sales in the first, and domestic sales in the second. In line with our hypothesis, the explanatory variables R&D expenditures, general administrative expenditures and advertising expenditures appear in both equations. As instrumental variables, Domestic GDP is used in the first equation, and foreign GDP and real exchange rate in the second. Our results indicate that there is a significant interrelationship between export and domestic sales. We found the following results: (i) R&D expenditures are significant and have a positive effect on export sales, however the magnitude of this effect is negligible, (ii) although having a significant positive effect on domestic sales, advertising expenditures have a negative effect on export sales due to the substitution of domestic and export sales, (iii) general administrative expenditures have a significant and positive effect on both domestic and export sales, (iv) real exchange rate

[4] As Melitz (2003) states , export costs significantly change the distribution of the gains from trade across firms, and only the more efficient can benefit from trade, while, less efficient firms lose their market share and profit.

[5] See Bilkey (1978), Cavusgil & Nevin (1981) for a detailed discussion of the potential benefits of exporting.

negatively affects export, (v) the effect of foreign GDP on export sales, and the effect of domestic GDP on domestic sales are found positive.

The organization of the paper is as follows: Section II reviews the literature and sets up the theoretical framework on the joint determinants of export and domestic sales. Section III presents the data and statistical methods. In Section IV, we present and discuss the empirical findings. The final section concludes the paper.

2. Theoretical Framework and Hypotheses

In the literature, the factors that may affect domestic and export sales performance of firms are divided into two main groups: internal and external. The effects of these factors can change in firm-level or industry-level. Two broad theoretical approaches provide the basis for categorizing the determinants of export performance[6] into internal and external factors (Sousa et al., 2008; Zou & Stan, 1998). The resource-based approach, and the contingency theory. The resource-based approach emphasizes internal organization resources and capabilities, and treats a firm's export performance based on firm-level activities such as size, capital intensity, firm experience and competencies.[7] In contrast, according to the contingency approach, external or environmental factors such as industrial, domestic and foreign market features are considered to influence a firm's export performance according to the strategies of the firm.

In the literature, with the exception of Salomon & Shaver (2005) and Snigh (2009), all studies analyzed the effects of these factors on export and firm performance by isolating domestic sales. According to Cooper & Kleinschmidt (1985), export intensity is positively correlated with the share of firms' domestic market, and perceptions of the potential in that market. This result is consistent with the findings of Bernard et al. (1995) (for US), Bernard and Wagner (1996) (for Germany), Bernard and Jensen (1999) (for US). They analyzed interaction between exporting and firm performance based on firm performance before, during, and after exporting, and concluded that export not only makes firms more productive, but also increases productivity (via learning from the experience of other countries). On the other hand, it is clear that firms' various decisions on production, R&D, management, advertising have many effects on both domestic and export sales. In addition, Yang et al. (1992) indicated that factors which

[6] See Sousa et al. (2008), Zou & Stan (1998), Leonidou & Katsikeas (1996), for detailed discussion about empirical literature on export performance.

[7]The nature of the industry and markets, pricing method, price competitiveness, types of product and market strategies and types of firms in the manufacturing sector are very important factors for export performance (Cooper & Kleinschmidt, 1985). However, there are many problems obtaining firm-level data. See Sousa et al. (2008) for a detailed discussion about difficulties in obtaining data.

affect domestic expansion also appear to be to the cause of export expansion, and vice versa. Hence, both export and domestic sales, and their joint determinants should be simultaneously analyzed. In this context, we review the joint determinants of export and domestic sales, such as R&D activity, advertising-marketing, and managerial characteristics.

2.1. R&D Activity

R&D activity has a bidirectional relationship with whether a firm is involved in exporting, and export performance: each affects the other. In general, many studies analyzed them simultaneously; however there is a lack of consensus on results for both firm and sector level, and for countries. For example, Hirsch & Bijaoni (1985), Benvignati (1990), Kravis & Lipsey (1992), Lee & Habte-Giorgis (2004) found that R&D activity (or technological intensity) has a significant positive influence on export and export performance. However, Wakelin (1998), Lefebvre et al. (1998) and Bechetti & Rossi (2000) indicated that R&D expenditures have no significant effect on the likelihood of being involved in exporting or on the share of export.

R&D activity is an important determinant of whether a firm becomes an exporter, and how much it exports. Moreover, exporting also moderates firm's product diversification, R&D activity, size and capital intensity. Using an unbalanced panel data of Spanish[8] manufacturing firms between 1990 and 1999, Golovko & Valentini (2011) confirmed this notion. They found that the positive effect of innovation[9] on growth rates is higher for firms engaging in exports, and also that being involved in exporting positively affects innovation. Similar results are obtained by Bleaney & Wakelin (1999) for 110 UK manufacturing firms quoted on the UK stock market, by Lee & Habte-Giorgis (2004) for the US manufacturing sector, Gourlay & Seaton (2004) for 2,134 UK firms between 1988-2001, and by Pla-Barber & Alegre (2007) for 121 firms in the French biotechnology industry.

Theoretically, R&D's positive effect on firm efficiency and competitiveness in regard to both domestic and export sales results in the consideration of production cost as a decreasing function of R&D expenditure. Using micro-level cross-section data for Taiwan, Aw & Batra (1998) analyzed the correlation between three factors: first, technical efficiency, second, a firm's expenditure in R&D and on-the-job training, and finally, its international linkages such as exporting, foreign direct investment,

[8] Barrios et al. (2003) also analyzed Spain's manufacturing sector using firm level panel dataset between 1990 and 1998. They also found positive effects of R&D spillover on both domestic and foreign firms' export ratios.

[9] Innovative firms face declining demand and marginal revenue in time in the domestic market, so that their propensity to export is bigger than non-innovative firms (Hirsch & Bijaoui, 1985).

and foreign technology licenses. One important result is that, compared to firms which only export, firms which simultaneously export and invest in R&D and training, are about 10-17% more efficient[10]. Such industries include textile, clothing, iron and steel, machinery, and transport industries.[11] Kravis & Lipsey (1992) also found that R&D intensity (and human capital) has positive influences on competitiveness of U.S. industries. On the other hand, for Turkey, Pamukcu (2003) showed that exporting has positive but statistically insignificant effect on the possibility of achieving innovation. However, being innovative increases the exporting probability. Similarly, Ozcelik & Taymaz (2004) found that although technology transfers by license or know-how agreements is not a significant determinant of manufacturing sectors' export performance, R&D and innovations are vital factors for the international competitiveness of manufacturing sector.

In our study, when the raw data is examined, it is seen that "manufacture of basic metals", "manufacture of machinery and computing machinery" and "electrical machinery" sectors have the highest share of R&D expenditures in total costs, and that exports constitute nearly 50% of total sales in these sectors. On the other hand, R&D expenditures are negligible for those sectors which focused on domestic sales. We hypothesize the following;

Hypothesis 1: *R&D expenditure increases both export and domestic sales*

2.2. Advertising-marketing expenditures

Advertising is usually used by firms to inform consumers about features of product and persuade them to purchase. Theoretically, advertising-marketing expenditure should have important influences on both domestic and export sales. In domestic sales, firms have much more information about the habits of their customers, custom and usage, market conditions, distribution methods, etc. However, gathering knowledge about

[10] Using a panel data set constructed from the Taiwanese electronics industries' firm surveys, taken in 1986, 1991 and 1996, Aw et al. (2007) found that exporting firms have significantly higher productivity growth than others. Additionally, although they indicated R&D expenditures alone do not have a significant impact, firms' prior exporting and R&D expenditure enhance the probability that the firm will invest in these activities.

[11] Obviously, these effects can be change according to firm-level or different industries. For example, Ito & Pucik (1993) revealed a positive impact for Japanese manufacturing firms, but for firm-size, the effect becomes insignificant. Kumar & Siddharthan (1994) found that R&D intensity has a significant effect for only in low and medium technology industries in India. Sterlacchini (2001) indicated that R&D disclosed a positive influence on all firms' export share, but for the purposes of export intensity, only for medium-sized firms. Similarly, using a 2,134 UK firm survey for the period of 1988 and 2001, Gourlay & Seaton's (2004) results showed that a high level of R&D expenditure augments export probability in many industries. However, Liu & Shu's (2003) results indicated that R&D expenditure plays a less important role on export performance for Chinese industries.

potential foreign consumers requires substantial expenditures[12], and many small and medium-sized firms in developing countries have financial restrictions, thus affecting the type of export information they can obtain. In this regard, Crick, Jones & Hart (1994) asserted that small-sized exporting firms in UK are generally concerned with aspects of competition, background characteristics of the export market, while medium-sized firms are more interested in potential barriers to entry, market size, and consumers' buying criteria. However, especially in developing countries, many firms have little or no information about the market and demand conditions of exporting countries, therefore the majority of firms have no overseas advertising-marketing strategy.

Studies found controversial results about effects of advertising-marketing expenditures on firms' export performance. For example, Willmore (1992), and Lado et al. (2004) asserted that advertising expenditure has a positive influence on export sales and on the share of export sales in total sales. On the other hand, Kravis & Lipsey (1992) indicated that advertising intensity has a significant negative effect on the US industries' competitiveness. Benvignati (1990) found that advertising has a negative but insignificant effect on export performance. Chiao et al. (2006) underlined the importance of a threshold in advertising expenditure. They emphasized that although advertising intensity effect firms' performance negatively at the initial stages of the advertising expenditure of small and medium-sized firms in newly-industrialized economies, after reaching a threshold, advertising expenditures have positive influences on performance. For Turkey, Koksal (2008) indicated that Turkish firms from the Aegean region which sell to foreign markets generally use less formal and less expensive sources, such as telephone interviews with customers, face-to-face interviews, and customer visits, rather than formal sources, such as test marketing and mail surveys. He revealed that the majority of exporting firms have no information on promotion, market size and growth rate of market, transportation and product adaptation. He also asserted that market characteristics information has a significant and positive influence on the exporting firms' performance measures. In Turkey, many of the manufacturing firms are small or medium-sized, and usually depend on informal sources for advertising (OECD, 2004). Many firms have no overseas advertising-marketing strategies. Advertising-marketing expenditures are therefore generally allocated to domestic rather than export sales. Thus, not expecting to find a significant effect of advertising-marketing expenditure on export sales, we offer no specific hypothesis.

Hypothesis 2: *Advertising expenditures increase domestic sales*

[12] See Leonidou &Theodosiou (2004) for detailed discussion on the export marketing information system.

2.3. Managerial Characteristics

Managerial characteristics are one of the most important internal factors. They have a significant effect on determination of other internal factors, and also minimize negative influences of external factors on firms. There are two categories of managerial characteristics (Leonidou et al., 1998), objective factors such as age group, education, professional experience (tenure), language proficiency, and work experiences, and subjective factors, such as risk aversion, quality, dynamism, cost-profit and growth perceptions. These factors are also labeled as board capital, which contains both human and social capital (Hillman & Dalziel, 2003; Haynes & Hillman, 2010). According to Golden & Zajac (2001), if board size is very small, the benefits of education level of the board, functional background, occupation, age, tenure, and experience all have significant impact on firms; however the notion of diminishing returns is valid as the board size increases.[13] In addition, in small and medium-sized firms, improvements in managerial characteristics can enhance firm managers' personal and social relationships (Acquaah, 2007) with external entities such as, suppliers, customers, competitors, government institutions/community organizations. In this respect, especially for developing countries, the possibility of an increase in sales is affected considerably by enhancement of managerial characteristics in small and medium-sized firms.

According to Bilkey (1978), a firm's management decision whether to enter the export market is affected by two factors. Firstly, the benefits are analyzed by managers. The second is the degree of the firm's international orientation, which is influenced by the firm's background, traditions and exporting conduct of the management. Leonidou et al. (1998) suggested that there is no reliable relationship between managerial variables and export behavior in the empirical literature, in contrast, Cavusgil & Nevin's (1981) survey results indicated that management was able to substantially influence the decision to export. By using a survey of 175 small export firms in the Philippines, Roxas & Chadee (2011) concluded that there is a positive interrelationship amongst the firm's social capital, export knowledge, entrepreneurial orientation and export performance. Similarly, the results of Gourlay & Seaton (2004) for 2,134 UK firms show that managerial-capital has a positive influence on export probability in many industries. In summary, managerial characteristics are very important for firm performance, not only for determining internal factors (R&D activities, monitoring and providing resources) (Hilmann & Danziel, 2003) but also for decreasing (or increasing) negative (positive) effects of external factors. For example, Robson et al. (2012) asserted that investment in creativity and innovation develops entrepreneurs' human capital and creates opportunities

[13] Golden & Zajac (2001) also indicate that for a very large board, this advantage becomes a disadvantage due to diffusion of responsibility, free-riding, and factionalization.

beyond the domestic market. For this reason, firm management and its experience have a crucial role in both a firm's involvement in export, and also total sales growth (Das, 1994). On the other hand, Hansen & Wernerfelt (1989) argued that organizational factors have a greater effect on profit rates than economic factors. In addition, managers can change organizational outcomes by generating context, and this context contains a complex set of psychological, sociological, and physical interactions. In addition, Leahy (2012) and Okwo & Ugwunta (2012) show that selling and general administrative expenses have a positive effect on profitability. In this study, we argue that general administrative expenditures can be considered as a function of firm's managerial characteristics. Because the majority of general administrative expenditure is made up of wages, travel, consultancy, licensing, and communication expenses, the magnitude and determination of these expenditures is affected by managerial characteristics[14], and we expect that these expenditures will affect firm sales both in the domestic and overseas markets. We therefore hypothesize;

Hypothesis 3: *General administrative expenditures increase both export and domestic sales*

In the 1980s and 1990s, most developing countries began to carry out export-oriented policies. However, many firms in these countries could not show the desired progress in exports due to difficult economic and market conditions. For example, in Turkey, the share of exports in the total revenue for manufacturing sectors was only 18.8% in 1996, and had only reached 25.6% in 2010. Thus, empirical studies which analyze the main factors that affect both domestic and export sales for developing countries are very important, because openness to competition in developing countries was neither able to sufficiently enhance competitiveness in domestic markets nor provide an important growth in exports. According to Hiep & Nishijima's (2009) findings, the increase in domestic market competition led to a shift in sales from the domestic to foreign markets. Voyvoda & Yeldan (2001) and Gunay et al. (2005) confirmed this situation for Turkey and asserted that openness had a very little effect on either competitiveness or on profit margins in the manufacturing sector.[15]

There are two fundamental issues worth noting after reviewing the literature. First, theoretical and empirical findings on export performance are ambiguous and/or converse which suggests that more empirical studies are needed in order to understand sales performance of firms. In addition, there is an insufficient number of studies that simultaneously investigate the

[14] General administrative expenses of firms listed on Istanbul Stock Exchange are examined and it is assumed that all firms have to keep records formally in a similar manner.

[15] Voyvoda & Yeldan (2001), Metin-Ozcan et al. (2002), and Gunay et al. (2005) emphasized that after export-oriented trade policies, one of the most important factors which effects manufacturing sector profit rate is the depression of real wage rates.

interrelationship between export and domestic sales, especially in developing countries. Firms' decisions about products, product diversification, production method, R&D, export, and advertising all now influence sales and profitability, not only in the domestic, but also in overseas markets. This is due to the elimination of national borders caused by increases in international trade and other technological developments. Thus, in the empirical section, we simultaneously analyze the interrelationship between domestic and export sales and the effects of general administrative expenditures, R&D expenditures and advertising-marketing expenditures on domestic and export sales.

3. Statistical Methods and Data

3.1. Empirical Modeling

We have already argued that domestic sales and export sales are not independent. Therefore, we estimate a system of equations that allows for simultaneous effects between export sales and domestic sales. We used two-stage least squares (2SLS) with fixed effects and estimated the following equations:

$$\boldsymbol{Exportsales_{i,t}} = \beta_0 + \beta_1 Domesticsales_{i,t} + \beta_2 R\&Dexpenditures_{i,t} + \beta_3 Generaladministrativeexpenditures_{i,t} + \beta_4 Advertisingexpenditures_{i,t} + \beta_5 ForeignGDP_{i,t} + \beta_6 Realexchangerate_{i,t} + \varepsilon_{i,t} \quad (1)$$

$$\boldsymbol{Domesticsales_{i,t}} = \alpha_0 + \alpha_1 Exportsales_{i,t} + \alpha_2 R\&Dexpenditures_{i,t} + \alpha_3 Generaladministrativeexpenditures_{i,t} + \alpha_5 Advertisingexpenditures + \alpha_4 DomesticGDP_{i,t} + \epsilon_{i,t} \quad (2)$$

The most important assumption made for the OLS is the orthogonality between the error term and regressors. Without it, the OLS estimator is not consistent. A regressor is said to be endogenous if it is not predetermined; that is, if it does not satisfy the othogonality condition. For the equation in question, a predetermined variable that is correlated with the endogenous regressor and uncorrelated with the error term is called instrumental variable. If the equation is overidentified, instrumental variable estimator becomes 2SLS estimator (Hayashi, 2000). In this context, two statistics are presented in the next section: Cragg-Donald statistics, which test whether the instruments are weak, and Sargan statistics, which test overidentifying restrictions.

In order to identify this system of equations, we must have explanatory variables that predict only exports, and that predict only domestic sales (Green, 2003). In equation 1, the dependent variable export sales and in equation 2 the dependent variable domestic sales are endogeneous. Both equations contain the explanatory variables R&D expenditures, general administrative expenditures and advertising expenditures. Since we model domestic GDP as a direct determinant of domestic but not export sales, we use it as an instrumental variable in

equation 1. On the other hand, we use foreign GDP and real exchange rate as instrumental variables in equation 2, since these are direct determinants of export but not domestic sales. We also use the lags of endogeneous variables as instrumental variables.

Following Salomon & Shaver (2005) and Snigh (2009), we employ 2SLS on each equation. Contrary to these studies, we employ 2SLS fixed effect estimation because our data contains all sub-sectors in the manufacturing industry. In addition, Hausman Test[16] results do not reject the null hypothesis that the error component and the regressors are uncorrelated; thus, we favored 2SLS fixed effects approach.

3.2. Data

We tested the hypothesis using a sample of 15 Turkish manufacturing sub-sectors [17] from 1996 to 2010. Export sales, domestic sales, R&D expenditures, general administrative expenditures and advertising expenditures data were obtained from the Central Bank of the Republic of Turkey[18].

We calculated the sub-sector specific foreign GDP index in the following manner. First, we calculated the export ratios in total exports of Turkey for each country, for each sector and for each year. Second, we multiply these ratios by the GDP for each exporting country of Turkey for each of these years. Thus, foreign GDP represents a weighted average of foreign GDP for each country. Finally, we collected exchange rates (PPI based real effective exchange rates (2003=100)) and GDP (Expenditure based on fixed prices (1998)) data published by the Central Bank of the Republic of Turkey database.

4. Results and Discussion

Table 1 presents descriptive statistics and correlations. As can be seen, correlations between general administrative expenditures and export,

[16] The idea underlying Hausman's test is that both the random effects and fixed effects estimators are consistent if there is no correlation between u_i and the explanatory variables X_{kit}. If both estimators are consistent, then they should converge to the true parameter values β_k in large samples. That is, in large samples the random effects and fixed effects estimates should be similar. On the other hand, if they are correlated, the random effect estimator is inconsistent, while the fixed effects estimator remains consistent (Adkins & Hill, 2007).

[17] This database provides industrial classification up to 2 digits as: 1. Food products, beverages and tobacco, 2. Textiles, 3. Wearing apparel and luggage, saddlery and footwear, 4. Products of wood and cork, 5. Paper and paper products, 6. Printing and Publishing, 7. Coke, petroleum products and nuclear fuel, 8. Chemicals and chemical products, 9. Rubber and plastic products, 10. Other non-metallic minerals, 11. Manufacture of basic metals, 12. Manufacture of machinery and computing machinery, 13. Electrical machinery, apparatus and medical and optical instruments, 14. Motor vehicles and trailers, 15. Electricity, gas and steam

[18] http://www.tcmb.gov.tr/sektor/yayinlar.htm

and general administrative expenditures and domestic sales are significantly positively correlated. The correlation between advertising and domestic sales is higher than between advertising and export sales; however, the opposite relation is valid for R&D. When dependent variables are analyzed, we see that domestic sales and export sales are significantly correlated ($r=0.55$, $p<0.001$), supporting. This significant correlation supports our position that these two variables are not independent, and therefore should be analyzed simultaneously.

Table 1: Descriptive Statistics and Correlations

	Export	D.Sales	R&D	Gen.Man.	F.GDP	Exc.Rate	D.GDP	Advertising
Export	1							
D.Sales	0.55	1.00						
R&D	0.58	0.35	1.00					
Gen.Manag.	0.81	0.84	0.49	1.00				
F.GDP	0.37	0.28	0.33	0.37	1.00			
Exc.Rate	0.36	0.46	0.32	0.50	0.65	1.00		
D.GDP	0.46	0.60	0.39	0.61	0.52	0.80	1.00	
Advertising	0.56	0.80	0.50	0.84	0.35	0.45	0.57	1.00
Mean	3.2E+09	8.7E+09	3.2E+07	4.4E+08	1.4E+14	1.0E+00	4.9E+11	5.7E+08
Std. Dev.	5.7E+09	1.1E+10	5.9E+07	5.1E+08	1.2E+14	5.4E-01	3.7E+11	7.8E+08
Maximum	4.3E+10	6.6E+10	3.5E+08	3.1E+09	4.9E+14	1.6E+00	1.1E+12	4.1E+09
Minimum	3.6E+05	2.3E+07	3.5E+02	1.3E+06	2.6E+10	8.2E-02	1.5E+10	7.0E+05

In Tables 2 and 3, we present the results from the systems of equations that we estimated and results of Cragg-Donald (CD) and Sargan Test statistics. The Cragg-Donald statistics should be above the critical value given for the instruments in order to be considered strong. Here our instruments are not rejected by the Cragg-Donald Test, because both in Table 2 and Table 3, it is (201.88 for Equation (1) and 17.64 for Equation (2)) always above the stated critical values. Sargan test for overidentification tests the joint null hypothesis that the instruments are valid and correctly excluded from the estimated equation. This statistic has an asymptotic chi-square distribution with degrees of freedom equal to the difference in the number of instruments and regressors. According to the Sargan Test results, we do not reject the validity of our instruments at conventional levels of statistical significance for both equations. Table 2 presents Equation (1) where export sales are the dependent variable and Table 3 presents Equation (2) where domestic sales are the dependent variable.

Table 2: SLS Fixed Effect Estimates

Export sales			
	Coefficient	Standard Error	P>|z|
Domestic sales	-0.13***	0.04	0.000
R&D expenditures	28.29***	4.33	0.000
General administrative exp.	13.84***	0.75	0.000
Advertising expenditures	-2.57***	0.56	0.000
Foreign GDP	4.96E-06*	2.61E-06	0.057
Real exchange rate	-1.37E+09**	4.81e+08	0.004
Constant	-3.8E+08	3.3E+08	0.248
F(14,189)=15.20		Prob>F=	0
Weak identification test (Cragg-Donald Wald F statistic):			201.881
Stock-Yogo weak ID test critical values:		10% maximal IV size	19.93
		15% maximal IV size	11.59
		20% maximal IV size	8.75
		25& maximal IV size	7.25
Sargan statistics (overidentification test of all instruments):			0.958
		Chi-sq(1) P-val:	0.3276

*p<0.10, **p<0.05, ***p<0.001

Table 3: SLS Fixed Effect Estimates

Domestic sales			
	Coefficient	Standard Error	P>|z|
Export sales	-0.93**	0.32	0.004
R&D expenditures	4.55	14.11	0.747
General administrative expenditures	19.15***	4.29	0.000
Advertising expenditures	4.35**	1.55	0.003
Domestic GDP	3.8E-03**	1.3E-03	0.005
Constant	-1.2E+09**	5.8E+08	0.043
F(14,189)=14.01		Prob>F=	0
Weak identification test (Cragg-Donald Wald F statistic):			17.649
Stock-Yogo weak ID test critical values:		10% maximal IV size	13.91
		15% maximal IV size	9.08
		20% maximal IV size	6.46
		25& maximal IV size	5.39
Sargan statistics (overidentification test of all instruments):			4.16
		Chi-sq(1) P-val:	0.1249

*p<0.10, **p<0.05, ***p<0.001

First of all, we examined the relationship between domestic and export sales, finding that a 1 TL increase in domestic sales reduces export sales by 0.13 TL, and a 1 TL increase in export sales reduces domestic sales by 0.93 TL. This is inconsistent with the pair wise correlations. Although our result is contrary to that of Snigh (2009), it is consistent with the conclusions of Salomon & Shaver (2005), which state that the goods of Turkish firms which may either be exported or sold domestically are substitutes.

The most striking result is R&D expenditures. The effect of R&D expenditures on export sales is positive and significant ($\beta = 28.29$). This result reinforces Ozcelik & Taymaz's (2004) statement that innovation or R&D activity is crucial for the competitiveness of manufacturing sector in export markets. When the raw data is examined, it is seen that sectors whose exports constitute nearly 50% of total sales have the highest share of R&D expenditures in total costs. These results are also consistent with Snigh (2009), Salomon & Shaver (2005), Lee & Habte-Giorgis (2004), Kravis & Lipsey (1992), Benvignati (1990). In contrast, R&D expenditures have no effect on domestic sales. Our raw data shows that R&D expenditures are negligible for those sectors which focused on domestic sales, suggesting/showing that R&D activity is ineffective for gaining competitive advantage in the domestic market. In this context, policies that promote R&D towards export-oriented firms may be effective in increasing their export sales.

When examining the results of general administrative expenditures, we found that a 1 TL rise in general administrative expenditures increase export sales by 13.84 TL, and domestic sales by 19.15 TL. Since most Turkish firms are small or medium-sized family enterprises, this result is very important. Management characteristics, such as education, professional experience, language proficiency, and international experience affect general administrative expenditures thorough personnel wages and administrative expenditures such as travel, consultation, and communication costs. In Turkey, many small or medium-sized firms are family business which lack professional management. According to Voordeckers et al. (2007) and Luan & Tang (2007), the employment of professional directors from outside the firm can have positive influence on performance. Hence, policies aimed at educating managers, for example, on collecting information about international markets, can improve management characteristics and also increase export sales and performance. This idea is also consistent with Gourlay & Seaton's (2004), observation that managerial capital has a positive effect on export probability in the majority of industries.

Contrary to our expectations, advertising expenditures have negative and significant effect on export sales. However, these expenditures have positive and significant effect on domestic sales. A 1 TL increase in advertising expenditures increases domestic sales by 4.35 TL. In Turkey, the

vast majority of firms in the manufacturing industry do not have an overseas marketing strategy. Since information about domestic demand is much more cost effective and more easily accessible, firms tend to concentrate on advertising and marketing activities for especially domestic market. That's why, an increase in advertising expenditure leads to decrease in export sales but an increase in domestic sales.

The results suggest that foreign GDP affects export sales positively; namely, a 1 million TL increase in foreign GDP increases export sales by TL4.96. Although Foreign GDP has a positive effect on export sales, the magnitude is very small. This result is important in explaining why the export share of manufacturing sectors' does not increase substantially upon export-oriented policies. This result also indicates that the majority of the production and growth in Turkish manufacturing subsectors depends on domestic weighted sales. Theoretically, depreciation of home country currency positively related to export sales. However, we found that the exchange rate negatively affects export sales, due to the aggregation bias problem as described in Nazlıoglu (2012). He showed that when sub-sectors of the manufacturing industry in Turkey are analyzed separately, the exports of some are positively related to the real-exchange rate, but others are negatively related. However, when the data set is analyzed with aggregation, against expectations, it was found that exports are negatively correlated with the real exchange rate. With regard to the other external variable, domestic GDP, we found that a 1 million TL increase in domestic GDP increases domestic sales by 3830 TL.

5. Discussion and Conclusions

The motivation of this study was to attempt to simultaneously evaluate the effects of the joint determinants of export and domestic sales. In this study of Turkey's manufacturing sectors, we applied 2SLS fixed effects model in a simultaneous equation system in order to examine the interaction between export sales and domestic sales. The results suggest that domestic sales are significantly and negatively related to export sales and export sales are significantly and negatively related to domestic sales. Furthermore, we conclude that domestic sales and export sales have trade-offs and are simultaneously determined, and Turkish manufacturing sector utilize from exporting –usually- only as a substitute of domestic sales. Hence, based on an analysis of panel data for Turkish manufacturing sector, this paper confirms conclusions of Salomon & Shaver (2005) and Snigh (2009), that domestic and export sales have a relationship in estimating an economic model.

In general, our results lead us to conclude that both advertising expenses and general administrative expenditures are important in determining domestic sales, but that the effectiveness of domestic GDP has

been greatly overstated. We also found that, as expected, R&D expenditures have no impact on domestic sales.

The most striking result concerns the role of R&D expenditures in the export sales equation. The sectors with the highest share of R&D expenditures in total costs export nearly 50% of their total production. This result was expected, and indicates that policies aimed at export-oriented manufacturing firms promoting R&D have the potential to increase competitiveness and the share of export in total revenue. Ozcelik & Taymaz (2008) asserted that public R&D support programs significantly and positively affect private R&D investment in the Turkish manufacturing industry. In addition, these researchers indicated that, compared to their larger counterparts, the participation of small firms in R&D support programs is more frequent, and their R&D investment per output is higher. These results demonstrate that investment in R&D activities may increase the export share of Turkish manufacturing sector. Further, as expected, we found that general administrative expenditures affect export and domestic sales significantly and positively. In developing countries, small and medium-sized firms have financial constraints that hinder the acquisition of experience and knowledge. This highlights the crucial of the role of governmental training centers operated in collaboration with universities for the development of small and medium-sized firms. These programs have the potential to improve the characteristics managers of small and medium-sized firms, and help develop their overseas relationships.

In Turkey, the advertising expenditures many of the small and medium-sized manufacturing firms engaged in the production for domestic market are mostly for domestic sales, and they lack experience of advertising and marketing policies for foreign markets. Since we found that export and domestic sales are negatively interdependent, the result that advertising expenditures have negative impact on export sales is not inconsistent with our other estimates. In this context, governmental training centers have a role in providing information to small and medium-sized firms on issues such as the market conditions of target countries, consumer habits, distribution channels, the use of the internet etc. In this way, such firms can also develop marketing and advertising strategies for export markets and increase their exports and competitive power.

The findings of this study contribute to the literature in several important ways. First, our results have important implications for managers, policy-makers and practitioners. Second, the findings provide a strong support for Salomon & Shaver's (2005) and Snigh's (2009) proposal that export and domestic sales are simultaneously determined and should not be analyzed in isolation. Finally, general administrative expenditures, one of the firms cost components, are considered as simultaneous explanatory variables of both export and domestic sales for the first time in this paper. Moreover, the results indicated that firms, which have more qualified

managers, can increase domestic and export sales simultaneously. In this context, small and medium sized firms can benefit from state universities about developing managerial characteristics by education programs, seminars, etc.

The results of this study make an important contribution to the direction of future research. Detailed firm level data on general administrative expenditures and advertising expenditures can provide a more comprehensive analysis, which can lead to important policy implications, especially for small and medium-sized family firms in developing countries. In addition, there is potential to make analysis comparison between the management performance of large firms and small or medium-sized firms with regard to the joint determinants of export and domestic sales.

REFERENCES

ACQUAAH, M. (2007) Managerial social capital strategic orientation, and organizational performance in an emerging economy, *Strategic Management Journal, 28(12),* 1235-1255.

ADKINS, L. C. & R.C. Hill. (2007) Using stata for principles of econometrics (3th ed.), John Wiley & Sons, Inc., New York.

AULAKH, P.S., Kotabe, M. & Teegen, H. (2000) Export Strategies and Performance of Firms from Emerging Economies: Evidence from Brazil, Chile, and Mexico, *The Academy of Management Journal*, 43(3), 342-361.

AW B. Y., Roberts M. J., & Winston T. (2007) Export market participation, ınvestments in R&D and worker training, and the evolution of firm productivity, *The World Economy, 30(1*), 83-104.

AW B.Y. & Batra, G., (1998) Technological capability and firm efficiency in Taiwan (China), *The World Bank Economic Review, 12(1),* 59-79.

BARRIOS, S., Görg, H., & Strobl, E. (2003) Explaining firms' export behaviour: R&D, spillovers and the destination market, *Oxford Bulletin of Economics and Statistics, 65(4),* 475-496.

BECKER, B., Chen, J., & Greenburg, D. (2013) Financial Development, Fixed Costs, and International Trade, *Review of Corporate Finance Studies*, 2(1), 1-28.

BECHETTI, L. & Rossi, S.P.S. (2000) The positive effects of industrial district on the export performance of Italian firms, *Review of Industrial Organization, 16,* 53-68.

BELLONE, F., Musso, P., Nesta, L., & Schiavo, S. (2010) Financial Constraints and Firm Export Behaviour, *The World Economy*, 33(3), 347-373.

BENVIGNATI, A. M. (1990) Industry determinants and differences in u.s. intrafirm and arms-length exports, *The Review of Economics and Statistics, 72(3),* 481-488.

BERNARD, A. B. & Jensen, J. B. (1995) Exporters, Jobs and Mages in U.S. Manufacturing, 1976-1987, *Borkings Papers on Economic Activity*, Microeconomics, 67-119.

BERNARD, A. B. & Jensen, J. B. (1997) Exporters, Skill-Upgrading, and the Wage Gap, *Journal of International Economcis*, 42(1), 3-31.

BERNARD, A. B. & Jensen, J. B. (1999) Exceptional exporter performance: cause, effect, or both?, *Journal of International Economics, 47,* 1-25.

BERNARD, A. B. & Wagner, J. (1996) Exports and success in German manufacturing, W*orking Papers 96-10,* Massachusetts Institute of Technology (MIT), Department of Economics.

BERNARD, A. B., Jensen, J. B., & Lawrence, R. Z. (1999) Exporters, jobs, and wages in U.S. manufacturing: 1976-1987, *Brokings Papers on Economic Activity. Microeconomics*, *1995*, 67-119.

BILKEY, W. J. (1978) An attempted integration of the literature on the export behavior of firms, *Journal of International Business Studies, 9(1),* 33-46.

BLEANEY, M. & Wakelin, K. (1999) Sectoral and firm-specific determinants of export performance: evidence from the United Kingdom, *Centre for Research on Globalisation and Labour Markets Research Paper*, 99/12.

CAVUSGIL, S. T. & Nevin, J. R. (1981) Internal determinants of export marketing behavior: An empirical investigation, *Journal of Marketing Research, 18(1),* 114-119.

CHANEY, T. (2005) *Liquidity Constrained Exporters*, Mimeo, University of Chicago.

CHIAO, Y. C. Yang, K. P., & Yu C. M., (2006) Performance, internationalization, and firm-specific advantages of SMEs in a newly-industrialized economy, *Small Business Economics, 26,* 475–492.

CRICK, D., Jones, M., & Hart, S. (1994) International marketing research activities of UK exporters: an exploratory study, *Journal Euromarketing, 3(2),* 7-26.

COOPER, R. G. & Kleinschmidt, E. J. (1985) The Impact of export strategy on export sales performance, *Journal of International Business Studies, 16(1),* 37-55.

DAS, M. (1994) Successful and unsuccessful exporters from developing countries: some preliminary findings, *European Journal of Marketing, 28(12),* 19-33.

GOLDEN B. R. & Zajac, E. J. (2001) When will boards influence strategy? inclination x power = strategic change, *Strategic Management Journal, 22(12),* 1087-1111.

GOLOVKO, E. & Valentini, G. (2011) Exploring the complementarity between innovation and export for SMEs' growth, *Journal of International Business Studies, 42,* 362-380.

GOURLAY, A. & Seaton, J. (2004) Explaining the decision to export: evidence from UK firms, *Applied Economics Letters, 11(3),* 153-158.

GREENE, W.H. (2003) Econometric Analysis, Prentice Hall, New Jersey.

GREENAWAY, D. Guariglia, A. & Kneller, R. (2007) Financial factors and exporting, *Journal of International Economics*, 73, 377-395.

GUNAY, A., Metin-Ozcan, K. & Yeldan, E., (2005) Real wages, profit margins and inflation in Turkish manufacturing under post-liberalization, *Applied Economics, 37(16),* 1899-1905.

HANSEN, G. S. & Wernerfelt, B. (1989) Determinants of firm performance: the relative importance of economic and organizational factors, *Strategic Management Journal, 10(5),* 399-411.

HAYASHI, F. (2000) Econometrics, Princeton University Press., Princeton.

HAYNES, K. T. & Hillman, A. (2010) The effect of board capital and ceo power on strategic change, *Strategic Management Journal*, *31*, 1145–1163

HIEP, N. & Nishijima, S. (2009) Export Intensity and Impacts from Firm Characteristics, Domestic Competition and Domestic Constraints in Vietnam: A Micro-data Analysis, Paper presented at the RIEB Seminar on March 19, 2009. Available on the web: http://www.apeaweb.org/confer/cruz09/papers/hiep-nishijima.pdf accessed on February 02, 2010.

HILLMAN A. J. & Dalziel, T. (2003) Boards of directors and firm performance: integrating agency and resource dependence perspectives, *Academy of Management Review, 28(3),* 383-396.

HIRSCH, S. & Bijaoui, I. (1985) R&D intensity and export performance: A micro view", *Weltwirtschaftliches Archiv, 121*, 238-251.

ITO, K. & Pucik, V. (1993) R&D spending, domestic competition, and export performance of Japanese manufacturing firms, *Strategic Management Journal, 14,* 61-75.

Katsikeas, C. S., Leonidou, L. C., & Morgan, N. A. (2000) Firm-level export performance assessment: Review, evaluation and development, *Journal of the Academy of Marketing Science, 28(4),* 493-511.

KOKSAL, M. H. (2008) How export marketing research affects company export?, *Market Intelligence & Planning, 26(4),* 416-430.

KRAVIS, I. B. & Lipsey, R. E. (1992) Sources of competitiveness of the united states and of its multinational firms, *The Review of Economics and Statistics, 74(2),* 193-201.

KUMAR, N. & Siddharthan, N.S. (1994) Technology, firm size and export behaviour in developing countries: The case of Indian enterprises, *Journal of Development Studies, 31(2),* 289-309.

LADO, N. Martínez-Ros, E., & Valenzuela, A. (2004) Identifying successful marketing strategies by export regional destination, *International Marketing Review, 21(6),* 573-597.

LEAHY, A. S. (2012) The Determinants of Profitability in The Pharmaceutical Industry, *American Journal of Health Sciences*, 3(1), 37-41.

LEE, J. & Habte-Giorgis, B. (2004) Empirical approach to the sequential relationships between firm strategy, export activity, and performance in U.S. manufacturing firms", *International Business Review, 13,* 101-129.

LEFEBVRE, E., Lefebvre, L. & Bourgault, M. (1998) R&D-related capabilities as determinants of export performance, *Small Business Economics, 10,* 365-77.

LEONIDOU, L. C. & Katsikeas, C. S. (1996) The export development process: an integrative review of empirical models, *Journal of International Business Studies, 27(3),* 517-551.

LEONIDOU, L. C., Katsikeas, C. S. & Piercy, N. F. (1998) Identifying managerial influences on exporting: past research and future directions, *Journal of International Marketing, 6(2),* 74-102.

LEONIDOU, L.C. & Theodosiou, M. (2004) The export marketing information system: an integration of the extant knowledge, *Journal of World Business, 39(1),* 12-36.

LIU, X. & Shu, C. (2003) Determinants of export performance evidence from Chinese industries", *Economics of Planning, 36,* 45-67.

LUAN, C. J. & Tang M. J. (2007) Where is independent director efficacy?, *Corporate Governance: An International Review, 15(4),* 636-643.

MELITZ, M. (2003) The impact of trade on intra-industry reallocations and aggregate industry productivity, *Econometrica,* 71, 1695-1725.

METIN-OZCAN, K., Voyvoda, E., & Yeldan E. (2002) The impact of the liberalization program on the price-cost margin and investment of Turkey's manufacturing sector after 1980, *Emerging Markets Finance and Trade, 38*, 71–101.

NAZLIOGLU, S. (2012) Exchange rate volatility and Turkish industry-level export: panel cointegration analysis, *The Journal of International Trade & Economic Development: An International and Comparative Review*, 1-20.

OECD (2004) *Small and Medium-Sized Enterprises In Turkey: Issues and Policies*.

OKWO, I. M. & Ugwunta, D. O. (2012) Impact of Firm's Input Costs on Firm Profitability: Evaluation of The Nigerian Brewery Industry, *Research Journal of Finance and Accounting*, 3(6), 78-89.

OZCELIK, E. & Taymaz, E. (2004) Does innovativeness matter for international competitiveness in developing countries?, The case of Turkish manufacturing industries. *Research Policy, 33,* 409-424.

OZCELIK, E. & Taymaz, E. (2008) R&D support programs in developing countries: The Turkish experience, *Research Policy, 37,* 258-275.

PAMUKCU, T. (2003) Trade liberalization and innovation decisions of firms: lessons from post-1980 Turkey, *World Development, 31(8),* 1443-1458.

PLA-BARBER, J. & Alegre, J. (2007) Analysing the link between export intensity, innovation and firm size in a science-based industry, *International Business Review, 16,* 275-293

ROBSON, P.J.A. et al. (2012) Exporting intensity, human capital and business ownership experience, *International Small Business Journal, 30(4),* 367-387.

ROXAS, H. B. & Chadee, D. (2011) A resource-based view of small export firms' social capital in Southeast Asian Country, *Asian Academy of Management Journal*, *16*(2), 1-28.

SALOMON, R. & Shaver, J. M. (2005) Export and domestic sales: Their interrelationship and determinants, *Strategic Management Journal, 26,* 855-871.

SNIGH, D. A. (2009) Export performance of emerging market firms, *International Business Review, 18,* 321–330.

STERLACCHINI, A. (2001) The determinants of export performance: a firm level study of Italian manufacturing, *Weltwirtschaftliches Archiv, 137(3),* 450-472.

SOUSA, C. M. P. Martínez-López, F. J., & Coelho F. (2008) The determinants of export performance: A review of the research in the literature between 1998 and 2005, *International Journal of Management Reviews, 10(4),* 343-374.

TADESSE, B. (2009) Volatility in exchange rate components and the volume of international trade, *The International Trade Journal, 23(2),* 110-141.

TENREYRO, S. (2007) On the trade impact of nominal exchange rate volatility, *Journal of Development Economics, 82,* 485-508.

TYBOUT, J. R. (2000) Manufacturing firms in developing countries: how well do they do, and why, *Journal of Economic Literature*, *XXXVIII*, 11-44.

VOORDECKERS, W., Gils, A.V., & Heuvel, J. V. D. (2007) Board composition in small and medium-sized family firms, *Journal of Small Business Management, 45(1),* 137–156.

VOYVODA, E. & Yeldan, A. E. (2001) Patterns of productivity growth and the wage cycle in Turkish manufacturing, *International Review of Applied Economics, 15(4),* 375-396.

WAKELIN, K. (1998) Innovation and export behaviour at the firm level, *Research Policy, 26,* 829–841.

WILLMORE, L. (1992) Transnationals and foreign trade: evidence from Brazil, *Journal of Development Studies, 28(2),* 314-335.

YANG, Y. S., Leone, R. P. & Alden, D. L. (1992) A market expansion ability approach to identify potential exporters, *Journal of Marketing, 56(1),* 84-96.

ZOU, S. & Stan, S. (1998) The determinants of export performance: a review of the empirical literature between 1987 and 1997, *International Marketing Review, 15(5),* 333-356.