

Box 4.3

Manufacturing Industry Firms' Elasticity to Shift into External Markets¹

Manufacturing industry firms that sell goods in both domestic and international markets are subject to not only domestic but also external demand shocks. Against these shocks, the degree of flexibility to switch between domestic and foreign markets is important to continue operations and to minimize the effects of shocks. For instance, in response to a negative domestic demand shock, a firm will be able to reduce its losses to the extent that it can shift its sales to external markets, and in some cases it can achieve more sales. A similar shift can be observed in response to a negative external demand shock as well. These shocks affect the firm's sales at the micro level and economic activity at the macro level. The size of these effects depends on the relationship between the domestic sales and exports of firms.

In economic literature, there are three main approaches to explain the relationship between domestic sales and exports at the firm level. First is the capacity constraints approach suggesting that an increase in domestic demand reduces exports in the short-term due to existence of production constraints (Belke et al., 2015). On the other hand, a decline in domestic demand facilitates allocation of more resources to production of export-oriented goods by releasing some production capacity reserved for domestic goods. If a firm does not have capacity constraints, it can adjust its sales in domestic and foreign markets independently from each other. The second main approach takes into account domestically-operating multinational companies and foreign direct investment (Wang et al., 2014). According to this approach, multinational firms or foreign direct investment inflows increase the efficiency of local firms, thereby create a positive effect on sales (*Direct Impact*). However, increased competition in the domestic market stemming from the entry of multinational companies has a negative impact on the sales of local firms (*Indirect Impact*). The third main approach focuses on the existence of differentiated exporters in international markets (McQuoid and Rubini, 2014). The term "differentiated" refers to whether a firm is a permanent exporter or a firm that can only be called a temporary exporter that shifts to external markets only in certain periods. The group under which a firm is classified depends on the relationship between firm size and marginal costs. Being a permanent or temporary exporter affects the relationship between domestic sales and exports. In addition to those approaches, factors such as the effectiveness of global value chains, the type and quality of goods sold in domestic and foreign markets, the relative profitability of selling goods in both markets, and the loyalty relationship between the seller and the buyer also play a role in determining the relationship between domestic sales and exports.

The relationship between domestic sales and exports of Turkish manufacturing firms that sell their goods in both domestic and external markets is examined in this box. The aim of the study is to question whether firms can substitute exports for their domestic sales (or have the flexibility of shifting from domestic sales to exports) in periods of weak domestic demand. We follow the methodology in Salomon and Shaver (2005) but we model exports by a single equation. Below are the main dynamic estimation models:

¹ This box involves the initial findings of the study by Gül (2018) in progress.

$$ex_{it} = \alpha_0 + \sum_{k=1}^{\rho} \beta_k(ex_{it-k}) + \alpha_1 ds_{it} + \alpha_2 X_{it} + \mu_i + \varphi_t + \vartheta_{it} \quad (1)$$

$$ex_{it} = \alpha_0 + \sum_{k=1}^{\rho} \beta_k(ex_{it-k}) + \alpha_1 ds_{it} + \gamma(DD_{t-1})ds_{it} + \alpha_2 X_{it} + \mu_i + \varphi_t + \vartheta_{it} \quad (2)$$

In the model (1), ex and ds represent the real exports and real domestic sales in Turkish liras for the firm i in year t , respectively. X is the matrix of control variables that includes firm characteristics such as age, size, leverage ratio, profitability ratio and cash ratio. Export and domestic sales are defined as logarithmic. The coefficient estimate of the α_1 parameter indicates the percentage change in exports caused by a 1 percent change in domestic sales, holding all the other conditions constant. Model (2) differs from the former by including the interaction term that is defined as the product of domestic sales and the domestic demand indicator (DD). The coefficient estimate of the interaction term shows the additional effect of a change in domestic sales on exports, when domestic demand is weaker than average. The domestic demand indicator is a dummy variable that takes the value 1 if the domestic demand is below the average of the period or the long-term trend and 0 otherwise. To construct this indicator, both the domestic demand forecasts published by the OECD and total and household final consumption statistics published by TurkStat are used. The main reason for considering the previous year's demand conditions in the estimation model is that it takes time for firms to adjust their sales between domestic and foreign markets. Since our data set is annualized, it is assumed that the adjustment will be completed within one year. In the study, which is based on the CBRT's Company Accounts Statistics for the 2004-2014 period, models were estimated by the system-GMM method considering the possible endogeneity problem. Taking the common domestic and external shocks and firm heterogeneity into account, we control for the time and firm fixed effects.

Table 1: Summary of Findings

	Model I	Model II	Model III	Model IV
<i>Exports_{it-1}</i>	0.395*** (0.046)	0.409*** (0.050)	0.398*** (0.049)	0.452*** (0.040)
<i>Domestic Sales_{it}</i>	-0.262*** (0.068)	-0.220*** (0.071)	-0.210*** (0.071)	-0.081* (0.048)
<i>Domestic Sales_{it} * (DD_{t-1})</i>		-0.070** (0.035)	-0.119*** (0.042)	-0.076* (0.041)
<i>Leverage Ratio_{it}</i>	-0.007* (0.004)	-0.007* (0.004)	-0.007* (0.004)	-0.011** (0.005)
<i>Profitability Ratio_{it}</i>	0.012*** (0.004)	0.011*** (0.004)	0.011*** (0.004)	0.006 (0.005)
<i>Cash Ratio_{it}</i>	0.008*** (0.002)	0.008*** (0.002)	0.008*** (0.002)	0.009*** (0.002)
<i>Firm's Age_{it}</i>	0.016* (0.009)	0.014 (0.010)	0.014 (0.010)	0.004 (0.010)
<i>Firm's Size_{it}</i>	0.817*** (0.088)	0.780*** (0.095)	0.795*** (0.094)	0.619*** (0.057)
<i>Number of Firms</i>	5947	5947	5947	5947
<i>Number of Observations</i>	24167	24167	24167	24167

Note: Leverage ratio is the ratio of short and long-term liabilities to total liabilities. Profitability ratio is defined as the ratio of net profits to total assets. Cash ratio refers to the ratio of cash and cash equivalents to short-term liabilities. Age is a categorical variable spanning 5-year periods between 0-50 years. Firm size is the logarithm of the number of employees. Models pass the tests for both autocorrelation and over identifying restrictions for instruments. Figures in parentheses are heteroscedasticity-robust standard errors. Significance levels are given as * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 1 presents the summary of findings. Estimates of equation (1) are provided in the first column. To show the robustness of the results, the remaining columns summarize the estimates of equation (2) in which three different domestic demand indicators are used. Findings can be listed under three main statements. The first finding indicates that there is a

substitution relationship between domestic and foreign sales of firms. In other words, while firms increase their exports as a response to the decline in their domestic sales, they decrease their exports when their domestic sales increase. In terms of magnitude, a 10-percent decline in domestic sales of a firm increases its exports by 2.6 percent on average, when holding other conditions constant. Demonstrating the substitution relationship between domestic and external markets, this finding is compatible with the findings of studies conducted for European countries and can be explained by the capacity constraints approach.

The second main finding is that the substitution relationship between domestic sales and exports differs among subsectors and according to firm characteristics. The elasticity of substitution is estimated to be higher for export-oriented, low-indebted and younger firms compared to domestic market-oriented, high-indebted and older firms. Several reasons underlying the heterogeneity at firm level can be listed as the firms' production technologies (labor or capital-intensive), the countries to which their exports are mostly destined, the degree of competition for the goods they sell in foreign markets, the imported input dependency of their goods and the price developments in foreign markets.

The third main finding is that the relationship between the domestic sales and exports is stronger in times following the periods of below average domestic demand. This result indicates that Turkish manufacturing industry firms operating in both domestic and foreign markets have the elasticity to shift from domestic market to external market (or to adjust their sales among both markets) in response to weak domestic demand. Since this mechanism is countercyclical, it supports economic activity through exports in times of weak domestic economic activity due to demand conditions. On the other hand, this finding can be interpreted as that manufacturing industry firms will shift to domestic market when domestic demand proves stronger than average. In this context, favorable performance in economic activity will worsen the foreign trade balance both by stimulating imports and by firms' favoring of domestic markets rather than export markets. Considering that exporters are the leading firms in manufacturing industry in terms of productivity (Demirhan, 2018), this tendency to abandon exports in periods of high growth can be expected to have a negative impact on long-term investment and the level of potential growth.

As a result, a substitution relationship exists between the domestic sales of the manufacturing industry firms and their exports. In other words, firms have the elasticity to shift to external markets when their domestic sales decline. This elasticity is stronger in years ensuing those with weak domestic demand. Due to its countercyclical nature, it supports the economy against weakening in domestic demand through the external demand channel. In this context, the slowdown in economic activity in the second half of the year is expected to accelerate the firms' tendency towards exporting in the coming period by the specified channel. Considering the favorable outlook for foreign demand conditions, it is predicted that net exports may continue to contribute to growth in 2019.

References

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