Determinants of Export Propensity and Performance: Evidence from Turkish Firm-Level Data

Elif Akben Selçuk
Kadir Has University, Faculty of Economics, Administrative and Social Sciences, Turkey.
e-mail: elif.akben@khas.edu.tr

İpek Gürsel Tapkı
Kadir Has University, Faculty of Economics, Administrative and Social Sciences, Turkey.
e-mail: ipek.tapki@khas.edu.tr

Abstract
The objective of the present study is to investigate the factors affecting Turkish firms’ export propensity and export performance. The dataset consists of 344 non-financial companies listed on Borsa Istanbul and covers the period from January 2005 to December 2014. Results from a random effects probit model reveal that larger and older firms are more likely to make export sales. In addition, results from a dynamic GMM estimation document that larger and younger firms have higher export performance. The same finding holds for highly leveraged companies. Finally, the real effective exchange rate is shown to have a negative impact on firm-level export performance in Turkey. Implications are provided.

Keywords: Export propensity, export performance, firm-level analysis, emerging markets, Turkey.

JEL classification: D00, D22, F39

1. Introduction
There is a clearly documented positive relationship between export performance and economic growth rate of a country. Many studies show that if there is an increase in the export level of a country, growth rate of that country increases. Because of this positive association, firm-level behavior and performance in export markets have received considerable attention over the last years. Depending also on greater availability of firm-level data, there are numerous studies of firm-level analysis of export performance.

The factors affecting the export performance have become the focus of this firm-level analysis of export behavior. For the developed countries, the literature contains a large number of studies analyzing the determinants of firm’s export propensity and performance. However, evidence from developing countries is much more limited. Since many industries in emerging economies rely on exports, emerging market firms are much more sensitive to the effects of international trade. Therefore, the export performance of firms is very critical for these countries and the factors affecting this performance warrant further investigation.

Turkey, as one of these emerging economies, adopts an outward-oriented trade policy since 1980. Implementing the export-led economic development strategy, export performance became an important factor of economic growth. As a result, a number of studies analyzed the export behavior of Turkey from a macroeconomic perspective. However, studies analyzing the firm-level export performance are very limited.

In this study, we attempt to fill the aforementioned gap by investigating firm characteristics and economic variables which have an impact on Turkish firm’s export behavior. By estimating a random effects probit model and a dynamic GMM model, we analyze the effect of firm size, number of years in business, leverage, profitability, and real exchange rate on the export propensity and export performance of Turkish firms.

The remainder of the paper is organized as follows. Section 2 provides a review of prior studies on firm level export behavior in developed and developing countries. Section 3 introduces the data employed in the study and discusses the estimation methodology. Empirical results are provided in Section 4. The final section concludes the study with a summary of findings, their implications, and suggestions for further research.
2. Literature Review

The issue of firms’ export behavior has received considerable attention over the last years. Several explanatory variables have been analyzed as potential determinants of firm-level export propensity and export performance. While there is a large number of studies about the export performance of the manufacturing firms, few studies also consider the service sector. Aabia and Slater (1989), Zhou and Stan (1998), and Sausa, Martinez-Lopez and Coelho (2008) provide a comprehensive review and analysis of the empirical literature on the determinants of firm-level export behavior.

Among the determinants of firm-level exports, firm size has been the most investigated factor in a large number of studies which usually document a positive relationship between firm size and exports. For instance, Sterlacchini (2001) analyzes the factors affecting firm-level export behavior among Italian manufacturing companies. More specifically, the author examines the effect of firm size on the export performance in Italy. He shows that while size and export are positively correlated for small size firms, this is not true for large firms. The relationship is U shaped for large firms. He also considers the industry specific features affecting the opportunities to export, for example, the propensity to take on work subcontracted by other firms and affiliation with a business group. He shows that the percentage of sales due to subcontracting depresses both the probability of exporting and the export intensity of small and medium-sized firms. He also documents that larger firms take advantage of being affiliated with business groups while the intensity of subcontracting decreases the export performance of small and medium-sized enterprises.

Other than firm size, real exchange rate is another factor which has consistently been shown to have a statistically significant impact on firm level export performance. Several studies have empirically demonstrated a positive relationship between these two variables (e.g. Dekle and Ryoo (2007), Majeed, Ahmad, and Khawaja (2006), Hsu, Tsai, and Yang (2007)).

In addition to studies investigating the factors affecting actual export performance, the literature also contains studies about the success determinants of exporters such as marketing orientation, firm size, management behavior, and characteristics of the product, market and industry (Madsen (1989), Chetty and Hamilton (1993), Cavusgil and Zou (1994), Diamantopoulos and Cadogan (1996), Slater and Narver (1996), Thirkell and Ramadhan (1998)).

Although the literature on firm-level exports mostly focuses on developed economies, a few number of studies investigate the determinants of export performance in emerging markets. In one such study of Brazilian companies, Christensen, Rocha, and Gertner (1987) determine the factors affecting the continuation of export performance. They find that firm characteristics, export management practices and manager perceptions are positively correlated with exporting success.

In another emerging market study, Bhavani, and Tendulkar (2010) analyze variables affecting the export decision and the export performance of firms in Indian textile garments and apparel industry. For the export decision, they consider the scale of operation, sales expenses and form of business organization as potential determinants. For the export performance, they consider scale, technical efficiency, wage share of gross output and form of business organization and using the Tobit model, they econometrically estimate the impact of these factors. They show the positive impact of technical efficiency, sales expenses and wage share of gross output on export performance.

There is also a limited number of studies about the export performance in Turkey but they consider this issue from the macroeconomic perspective. There are not many studies which analyze the determinants of firm-level export performance. In one such study, Ayan...
and Percin (2005) analyze the determinants of firm’s export performance in Turkey. They show that there is a positive correlation between environmental and managerial factors and export marketing strategies and the firm export performance. They also show that there is no correlation between firm’s demographic characteristics and export performance.

In a more recent study, Demirhan (2015) analyzes the export behavior of the Turkish firms. Using the firm-level data between 1989 and 2010, she shows that self-selection and learning by exporting are the main sources of superiority of the exporting firms over non-exporters. However, this study focuses on only the manufacturing sector in Turkey. Finally, Coban (2015) analyzes the causal relationship between financial development and export performance of firms in manufacturing sector in Turkey over the 1991-2012. She shows the effect of the development of the stock market on the export performance and she demonstrates the fact that the financial development can be used as a predictor of export performance.

3. Methodology

3.1. Data and Variables

The dataset consists of 344 companies listed on Borsa Istanbul and covers the period from January 2005 to December 2014. Financial firms are not included in the analysis due to the distinct nature of their financial statements. As a result of missing observations in some years, the final dataset consists of unbalanced panel data containing 3015 firm-years. Financial statements data for the companies in the sample are obtained from the Public Disclosure Platform which is publicly accessible website containing information on Turkish companies.

Given the objective of the study, which is to investigate the factors affecting exports propensity and exports performance among Turkish firms, the following two dependent variables are included in the analysis: Export propensity is measured by a categorical variable taking the value of “1” for firms obtaining some of their sales internationally and “0” otherwise. On the other hand, export performance is measured by the ratio of the firm’s exports sales to its total sales.

Firm-level explanatory variables include size, number of years the firm is in business (age), leverage and profitability. Firm size is measured by the natural logarithm of total sales. Age is defined as the number of years since the firm’s incorporation. Given that a curvilinear relationship between firm age and exports performance is possible, we also include the squared value of the age variable into the analysis of exports performance. Leverage is measured as the ratio of total interest bearing debt to total assets while profitability is measured with the gross profit margin.

In addition, we include the real exchange rate as an independent variable in our models. CPI based real effective exchange rate is obtained from the Central Bank of the Republic of Turkey. This variable is calculated by purifying relative price effects in the nominal exchange rate. The analysis also includes a crisis dummy for the years 2008 and 2009, in order to incorporate any potential impact of the 2008 financial crisis on firm level exports.

Finally, we incorporate industry dummies into our models in order to control for the fact that some industries may be more open to exports than others.

3.2. Estimation

Considering the panel structure of our dataset, we employ two separate models. Given the categorical nature of the export propensity variable, a random effects probit model is
estimated to investigate the factors which differentiate exporting firms from non-exporting firms. Next, export performance is estimated using the Arellano and Bond (1991) dynamic generalized method of moments (GMM) estimator which has the advantage of addressing a potential endogeneity problem and of reducing the incidence of bias as a result of mismeasurement.

4. Results

A preliminary investigation of the descriptive statistics related to our dataset reveals that approximately 66 percent of the observations belong to firms which derive a portion of their total sales from abroad. The export performance given by the ratio of exports sales to total sales registers a mean value of 16.65 percent and a standard deviation of 22.54 percent.

The results of the random effects probit model which investigates the factors affecting export propensity are presented on Table 1 below. According to these empirical results, the only factors which distinguish exporting Turkish firms from non-exporting ones are firm size and the number of years since the firm was incorporated. For the companies in our sample, larger and older firms are more likely to derive some of their revenues from abroad. Neither the other firm specific variables including profitability and leverage, nor the real exchange rate have a significant impact on the likelihood of exporting for Turkish firms. The probability of exporting does not exhibit any difference during crisis periods either.

Table 1. Determinants of export propensity

<table>
<thead>
<tr>
<th></th>
<th>Coef.</th>
<th>Std. Err.</th>
<th>z</th>
<th>[95% Conf. Interval]</th>
<th>Sign.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>.391</td>
<td>.051</td>
<td>7.65</td>
<td>.291</td>
<td>.491</td>
</tr>
<tr>
<td>Age</td>
<td>.071</td>
<td>.009</td>
<td>7.48</td>
<td>.052</td>
<td>.089</td>
</tr>
<tr>
<td>Leverage</td>
<td>.002</td>
<td>.002</td>
<td>1.44</td>
<td>-.001</td>
<td>.005</td>
</tr>
<tr>
<td>Profitability</td>
<td>-.002</td>
<td>.002</td>
<td>-.91</td>
<td>-.005</td>
<td>.002</td>
</tr>
<tr>
<td>Crisis dummy</td>
<td>.67</td>
<td>.105</td>
<td>.64</td>
<td>-.139</td>
<td>.272</td>
</tr>
<tr>
<td>Real exchange rate</td>
<td>.005</td>
<td>.005</td>
<td>1.10</td>
<td>-.004</td>
<td>.002</td>
</tr>
<tr>
<td>Constant</td>
<td>-8.596</td>
<td>1.120</td>
<td>-7.68</td>
<td>-10.791</td>
<td>-6.401</td>
</tr>
<tr>
<td>Number of obs</td>
<td>2932</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of groups</td>
<td>344</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wald chi-squared</td>
<td>145.11</td>
<td></td>
<td></td>
<td></td>
<td>***</td>
</tr>
</tbody>
</table>

***, **, and * denote significance at 1%, 5%, and 10% respectively.

Table 2 below contains the results from the dynamic GMM model which investigates the determinants of firm-level export performance. The first finding which emerges from the empirical analysis is that the lagged value of the export performance variable has a significant and positive impact on its current value. Moreover, the exports performance has been found to be higher for larger firms. Surprisingly, our results show that as firm age increases, exports performance decreases. Moreover, the relationship between firm age and exports performance has been found to be a concave one. In addition, the leverage variable has a positive and statistically significant coefficient meaning that firms employing more debt in their capital structure have a higher ratio of exports sales to total sales on the average. The final variable which turned out to be a significant determinant of export performance is the exchange rate. Consistent with the empirical and theoretical literature, a negative relationship between the real effective exchange rate and export performance has been demonstrated. Firm profitability
measured by gross margin does not turn out to be a significant predictor of exports sales. The exports performance is not significantly different in crisis years either.

### Table 2. Determinants of export performance

<table>
<thead>
<tr>
<th></th>
<th>Coef.</th>
<th>Std. Err.</th>
<th>z</th>
<th>[95% Conf. Interval]</th>
<th>Sign.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Export performance(-1)</td>
<td>.579</td>
<td>.040</td>
<td>14.59</td>
<td>.502</td>
<td>.658</td>
</tr>
<tr>
<td>Size</td>
<td>2.241</td>
<td>.480</td>
<td>4.88</td>
<td>1.400</td>
<td>3.281</td>
</tr>
<tr>
<td>Age</td>
<td>-1.100</td>
<td>.350</td>
<td>-3.14</td>
<td>-1.785</td>
<td>-.413</td>
</tr>
<tr>
<td>Age²</td>
<td>-.009</td>
<td>.004</td>
<td>2.31</td>
<td>.001</td>
<td>.017</td>
</tr>
<tr>
<td>Leverage</td>
<td>.042</td>
<td>.014</td>
<td>2.94</td>
<td>.014</td>
<td>.069</td>
</tr>
<tr>
<td>Profitability</td>
<td>-.001</td>
<td>.006</td>
<td>-.14</td>
<td>-.013</td>
<td>.011</td>
</tr>
<tr>
<td>Crisis dummy</td>
<td>-.073</td>
<td>.609</td>
<td>-.12</td>
<td>-1.268</td>
<td>1.121</td>
</tr>
<tr>
<td>Real exchange rate</td>
<td>-.089</td>
<td>.048</td>
<td>-1.87</td>
<td>-.182</td>
<td>.004</td>
</tr>
<tr>
<td>Constant</td>
<td>19.239</td>
<td>16.821</td>
<td>1.14</td>
<td>-13.728</td>
<td>52.208</td>
</tr>
</tbody>
</table>

|                        |       |           |       |                     |
| Number of obs          | 2242  |           |       |                     |
| Number of groups       | 341   |           |       |                     |
| Wald chi-squared       | 233.93| ***       |       |                     |

***, **, and * denote significance at 1%, 5%, and 10% respectively.

### 5. Conclusion

The objective of the present study was to investigate the factors affecting exports at the firm level in an emerging economy, Turkey. Specifically, we analyzed the determinants of export propensity as measured by a dummy variable and the determinants of export performance as measured by the ratio of a firm’s exports sales to its total sales.

Our empirical results showed that larger firms and firms who have been in business for many years display higher export propensity, i.e. they are more likely to engage in international transactions. The analysis did not reveal any additional firm-level or macroeconomic factors as determinants of export propensity among Turkish firms listed on Borsa Istanbul.

In addition, results from a dynamic GMM model showed that larger firms have better export performance. This finding is consistent with prior studies in the literature as explained by Aabia and Slater (1989), Zhou and Stan (1998), and Sausa, Martinez-Lopez and Coelho (2008). According to Wagner (1995), this relationship could be due to economies of scale, highly specialized executives, a lower cost of financing or a high capacity to take risks. As expected, the real effective exchange rate has been shown to have a significantly negative impact on firm-level export performance as also mentioned by the other studies on several countries (e.g., Dekle and Ryoo (2007) for Japan, Hsu, Tsai, and Yang (2007) for Taiwan, Majeed, Ahmad and Khawaja (2006) for a sample of 38 developing countries).

A surprising finding that emerged from our analysis is that younger firms enjoy better export performance. This could be due to the fact that they have a higher propensity to take risk. Furthermore, the relationship between firm age and export intensity has been shown to be a concave one. Finally, analysis results have shown that firms employing more interest bearing debt in their capital structure have a higher ratio of export sales to total sales.

From a policy perspective, two important results emerged from our analysis. First, since firm size has a significant impact on exports, policy makers could focus on the scale of production to boost international sales (Abbas, Sheikh, and Abbasi, 2015). Second, policy makers should design an effective exchange rate policy given the significant impact of this variable on firm-level exports.

Although this paper offered significant insight on the factors affecting firm-level export behavior in an emerging economy, it also suffers from a number of limitations. First, since the analysis was based on data from a single country, the results cannot be generalized.
Second, a number of variables including research and development expenditures, business group affiliation or geographical location could not be investigated due to unavailability of data. Therefore, future studies using a larger sample of emerging economy firms and incorporating additional variables in the analysis would significantly contribute to the literature.

References

