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The Impact of Financial Structure on Export Performance: The Case of Manufacturing Sectors in Turkey[1]

(Research Article)

Finansal Yapının İhracat Performansına Etkisi: Türkiye İmalat Sanayi Sektörleri Uygulaması

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ABSTRACT

A substantial amount of empirical research has explored the decisive role of var-ious external and internal forces on determining the sector export performance. However, there are a few studies, considering financial structure as a determi-nant of export performance. This paper aims to provide a better understanding of the relationship between a set of financial variables and export performance in Turkey's 24 manufacturing sectors for the period between 2008 and 2016.

According to the panel EGLS results, short-term debt, bank loans, size, interest expenses and return on equity have a positive effect on export intensity in con-trast to the return on asset, current asset ratio and foreign exchange rate. Conse-quently, we find substantial evidence that more short term-debt and bank loans in the capital structure lead to an increase in export performance. Further, firms with larger sizes, higher return on equity tend to present higher export performance.

1.GİRİŞ

Export can be seen as the primary source of productivity increase in developing countries. It promotes economic growth via scale effect and externalities (Helpman & Krugman 1985). Furthermore, it gives an opportunity to access new technologies and knowledge via learning

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by exporting. On the other hand, export can help firms to improve their performance and knowledge, to develop an innovative product, to expand into new markets or enter a new market segment (Leonidou et al. 2002:102-105).Therefore, export performance has a vital role in firm strategies as well as in output quality. For this reason, export performance is the main reason of firm heterogeneity. Since the export performance of firms has received considerable attention in the last decade, a substantial amount of empirical research has explored the decisive role of the various external and internal forces in determining the sectors export performance. The new line of international trade theories, on the other hand, takes firm heterogeneity into account to explain why some firms engage international trade and others do not (Melitz, 2003). However, few empirical studies consider relationships between the financial structure and export performance. Therefore, empirical literature is quite limited.

Pacheco (2017) investigated the relationship between the financial structure and export intensity in Portuguese industrial firms for the period between 2011 and 2014. The results show that lower debt, greater profitability and higher size SMEs tend to offer greater export intensity and diversification.

Maurel (2008) analyzed French wine companies from 1996 to 2005. The author revealed that there is a positive relationship between export performance and firm profitability, while there is a negative relationship between receivable accounts, payable and export performance.

Kiendrebeogo and Minea (2017) investigated financial factors that influenced export participation. In this context, they analyzed 1,655 Egyptian manufacturing firms between 2003 and 2008. The results indicate that financial liquidity improves export performance, and financial constraints have a negative impact on export intensity.

Nakhoda (2016), examines the impact of long-term secured loans on exports performance for Pakistan. He states that the internal sources of finance and the capital structure of a firm has a greater effect on exporting activities.

Bellone et al. (2010), examined the relationship between financial constraint and firm export behaviour. They analyzed 25,000 French manufacturing enterprises over the period from 1993 to 2005. They noticed that external sources accessibility increases export participation. Moreover, the authors revealed that financial constraints reduce the export intensity.

The authors Berman and Héricourt (2010),analyzed 5000 firms from 9 developing and emerging economies to reveal how financial factors affect the export decisions of firms. Using cross-country and firm-level data for the period from 1998 to 2004, they realized that financial constraints have a negative effect on export market participation.

According to the limited literature, financial constraints can affect export performance negatively. Also, Greenaway et al. (2005) explore the relation between firms' financial structure and export performance. They examine whether exporters have better financial structure than non-exporter. They used 9292 large UK manufacturing firms to investigate financial structure differences between exporters and non-exporters for the period 1993-2003. Their results indicate that low liquidity and high leverage have negative effect on export performance and finance is an important determiner of firms' investment and participation in the export market.

In fact, a study by Toplak, Özdemir and Kula (2007) examined the determinants of export performance among Turkish companies. They investigate the impacts of firm attributes, the sector in which the business operates, export method and location of firm on export performance. They obtained data from a survey on 581 Turkish exporting companies in 2002. They find out that export method has no influence on export performance. They claim that that geographical location of the firm has impact on export performance. Another issue in the literature in international trade is sunk costs. Firms have to tolerate with a view to enter foreign markets. Abor et al. (2014) indicate that older firms, more productive firms, and larger firms are more likely to take the important step of entering into the export market since they have much more potential to handle sunk costs.

On the other hand, Nazar and Saleem (2009) states that export performance is related with different kind of determinants. They classified them into firm's characteristics. According to them, export performance as the result of firm's actions. They determine the factors as management characteristics, attitudinal characteristics, skill-based characteristics, behavioural characteristics, firm's characteristics and competencies, export marketing strategic capabilities, utilization of international marketing research, segmentation and targeting, production capabilities, pricing capabilities, distribution capabilities and finally promotion capabilities. According to, Nazar and Saleem (2009) firm size is taken as controllable factor and is an important determinant of export performance.

A study by Zou and Stan (1998) has found firm size has positive effect on export performance if measured in terms of total sale. However, firm size has negative effects on export profits if measured by number of employees. Vervaal and Donkers (2002) state that the specific investments and the costs of safeguarding have a significant role in export relationships. They claim that firm size is related with these factors. Therefore, there is a relationship between firm size and export intensity.

As discussed in literature, recent studies have emphasized the importance of firm heterogeneity in international trade. However, most of those empirical studies have dismissed the relationship between financial structure and export. Whereas, export performance can be affected by the financial structure of firms. Hence, the major contribution of this paper is to consider the role of the financial structure in export performance. The difference of this study from previous studies is to contribute to the existing literature in two different ways. First, in the model, apart from previous studies, which used limited part of financial structure as firm heterogeneity, on the other hand we considered debt structure, loans, size of firm, current ratio, current asset ratio, return on asset, and return on equity as financial structure. Second, we did not neglect the macroeconomic factors such as interest expenses and exchange rate at therewithal. Hence, the novelty of this study is to take into account a set of financial structure factors impact on export performance at the firm level. To test the relationship between financial structure and export performance of firms, our empirical analysis is computed for 24 manufacturing sectors in Turkey over the period from 2008 to 2016. We used export intensity as a measure of export performance. We investigate the stationary test via Bai& Ng (2004) Panic unit root test. Then we find out that there is heteroscedasticity problem at the model. Therefore, we use panel EGLS. According to the estimation, short-term debt, bank loans, size, interest expenses and return on equity have a positive effect on export intensity in contrast to the return on asset, current asset ratio and foreign exchange rate. As a result, we find evidence that more short term-debt and bank loans in the capital structure lead to an

increase in export performance. Further, firms with larger sizes and higher return on equity tend to present higher export performance. Our results reveal that financial structure influences export intensity.

This paper is arranged as follows: Following this section, the data used and definitions are in section 2. Our empirical results are in section 3. Finally, the conclusion is in section 4.

2. DATA

Our dataset covers the period from 2008 to 2016. It comprises 24 manufacturing sectors. To examine the relationship between export intensity and financial structure, we use sectoral balance sheet, profitability and loss statement. The Dataset is obtained from the Central Bank of the Republic of Turkey. We use Nace Rev.2-2 digit sector classification as it can be seen in Table 1.

Table 1. Sector Names and Divisions According to Nace Rev-2 Classification

Sector	Division	Sector	Division
Manufacture of food products	C-10	Manufacture of rubber and plastic products	C-22
Manufacture of beverages	C-11	Manufacture of other non-metallic mineral products	C-23
Manufacture of tobacco products	C-12	Manufacture of basic metals	C-24
Manufacture of textiles	C-13	Manufacture of fabricated metal products, except machinery and equipment	C-25
Manufacture of wearing apparel	C-14	Manufacture of computer, electronic and optical products	C-26
Manufacture of leather and related products	C-15	Manufacture of electrical equipment	C-27
Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	C-16	Manufacture of machinery and equipment n.e.c	C-28
Manufacture of paper and paper products	C-17	Manufacture of motor vehicles, trailers, and semi-trailers	C-29
Printing and reproduction of recorded media	C-18	Manufacture of other transport equipment	C-30
Manufacture of coke and refined	C-19	Manufacture of furniture	C-31

petroleum products

Manufacture of chemicals and chemical products	C-20	Other manufacturing	C-32
Manufacture of basic pharmaceutical products and pharmaceutical preparations	C-21	Repair and installation of machinery and equipment	C-33

Source: Central Bank of the Republic of Turkey (2016).

In this study, we use export intensity as the dependent variable. On the other side, short-term debt, long-term debt, bank loans, return on asset, return on equity, size, current ratio, exchange rate and interest expenses are used for the independent variable, as it can be seen in Table 2.

Table 2. Dependent and Independent Variables Description

Variables	**Sign**	**Formula**
Dependent Variable		
Export Intensity	Exp	Total foreign sales/ total net sales
Independent Variables		
Short-Term Debt	Shd	Short-term debt/ total assets
Long-Term Debt	Lnd	Long-term debt/ total assets
Bank Loans	Loan	Bank loans/ total short-term debt
Return on Asset	Roa	Earnings before interest and tax payment / total assets
Return on Equity	Roe	Net income / shareholder's equity
Size	Size	Natural logarithm of total sales
Current Ratio	Cr	Current assets / current liabilities
Current Asset Ratio	Car	Current asset/ total asset
Exchange Rate	Exch	Exchange rate changes
Interest Expenses	IntExp	Total interest expenses/ net sales

Summary statistics of our sample is displayed in Table 3.The mean of export intensity is 27.78 which indicates that firms exported almost two thirds of their sales in the sample. The mean of return on asset is % 8.42 and the mean of return on equity is % 9.11 which implies that the average of the profitability of firms in manufacturing sectors is % 8.42 and % 9.11 regarding with Roa and Roe respectively. The mean of short-term debt is 0,40 and long-term debt is around 19.61 in the sample. The mean of the bank loan ratio is 45.23. On the other hand, we use the logarithm of total sales as size variable and its average is 16.16 for the full sample. The mean value of interest expense ratio is 4.02and exchange rate is -0.015. The mean of current ratio, which shows a firm's ability to cover short-term obligations, is 155. On

the other side, median and standard deviation of the variables are displayed in the second and third columns respectively.

Table 3. Descriptive Statistics

Variables	Mean	Median	Standard Deviation
Exp	27.78	24.50	14.94
Shd	40.07	40.06	7.769
Lnd	19.61	18.39	7.567
Loan	45.23	46.96	12.31
Car	60.90	61.89	9.348
Intexp	4.209	3.565	2.313
Roe	9.113	9.10	7.593
Roa	8.424	8.150	3.003
Size	16.16	16.23	1.169
Exch	-0.015	-0.01	0.060
Cr	155.20	152.7	26.38

Source: Authors' own calculations using the data from Central Bank of the Republic of Turkey (2016)

3. EMPIRICAL RESULTS

Ignoring the existence of cross-sectional dependence can cause misleading results. Therefore, the Pesaran scaled LM test is performed to test cross-sectional dependence. Table 4 represents cross-sectional dependency test results.

Table 4. Cross-Sectional Dependency Test

Variables	Pesaran Scaled LM	Variables	Pesaran Scaled LM
Exp	1.598 (0.000)	Intexp	31.865 (0.000)
Shd	1.129 (0.000)	Roe	6.574 (0.000)
Lnd	0.222 (0.000)	Roa	6.4850 (0.000)
Loan	9.045 (0.000)	Size	47.028 (0.000)
Car	9.016 (0.000)	Cr	10.823 (0.000)

The null hypothesis of the Pesaran scaled LM test indicates that there is no cross-sectional dependence among the panel units, and we reject the null at %1 significance level for the series. For this reason, we used the panic unit root test proposed by Bai & Ng (2004). Firstly, we regressed the series to trend and constant to seek the significance of constant and trend, and we concluded that trend is not significant for the series.

Table 5. Panic Unit Root Test

Variables	**Constantand Trend** **PCe_Choi (p-value)** **PCe_MW (p-value)**	**Constant** **PCe_Choi(p-value)** **PCe_MW(p-value)**	**None** **PCe_Choi (p-value)** **PCe_MW (p-value)**
Exp	2.357(0.009) 66.11(0.017)	-0.503(0.692) 39.27(0.674)	-2.410(0.992) 21.38(0.998)
Shd	0.666(0.252) 50.24(0.239)	-1.139(0.872) 33.31(0.879)	-2.155 (0.984) 23.78(0.994)
Lnd	0.857(0.195) 52.04(0.189)	-0.365(0.642) 40.57(0.619)	-1.227(0.890) 32.48(0.900)
Loan	1.402(0.080) 57.15(0.088)	-0.137(0.554) 42.70(0.527)	-1.858(0.968) 26.56(0.982)
car	1.608(0.053) 59.09(0.063)	-0.873(0.808) 35.80(0.805)	-2.619 (0.995) 19.42(0.999)
IntExp	1.663(0.048) 59.60(0.058)	-0.449(0.673) 39.78(0.652)	-2.107 (0.982) 24.22(0.993)
Roe	-0.386(0.650) 40.37(0.877)	0.553(0.289) 49.19(0.273)	-1.273(0.898) 32.05(0.909)
Cr	2.074(0.019) 63.45(0.028)	3.150(0.001) 73.55(0.003)	0.617(0.268) 49.79(0.253)
Size	1.616(0.053) 59.14(0.063)	1.106(0.134) 54.37(0.135)	0.928(0.176) 52.71(0.172)

Roa	-1.130(0.087)	-0.325(0.627)	-1.523(0.936)
	33.39(0.877)	40.94(0.603)	29.70(0.951)

Table 5 shows the unit root test results proposed by Bai and Ng (2006). According to the unit root test results, all variables have unit root except size variable. On the other hand, to determine the appropriate model, some descriptive statistics and model specification tests are performed. The results are illustrated in Table 6 and Table 7. Table 6 represents Breusch and Pagan Lagrangian multiplier test, F test and likelihood-ratio test results. The null of Breusch and Pagan Lagrangian multiplier test states that the pooled model is the appropriate model against the random effect. As stated in the table the null is rejected. Since our data set is not chosen randomly and the null is rejected in F test, we performed fixed effect model. Therefore, we estimate the model using fixed effect.

Table 6. Breusch and Pagan Lagrangian Multiplier Test, F Test and Likelihood-Ratio Test

Test	**Results**
Breusch and Pagan Lagrangian Multiplier Test	Prob>Chibar2= 0.000 Chibar2(01)= 416.69
Likelihood-ratio Test	Chibar2(01)= 264.12 Prob>=Chibar2= 0.000
F Test	F(21,145)= 51.40 Prob> F= 0.000

Multiple-linear regression can be estimated under some assumptions. Table 7 shows the heteroscedasticity, autocorrelation, and cross-sectional dependence test results. According to Wald chi-square test statistic, we have heteroscedasticity problem in our data set. Durbin Watson and Baltagi and Wu test statistics are not less than 2. It means that autocorrelation is not a severe problem. On the other hand, the null of Frees' test is there is no cross-sectional dependence among the panels. According to Table 7, we cannot reject the null of Frees'. Thus, the results indicate that there is no cross-sectional dependence among the variables. Due to the heteroscedasticity problem, we should use the panel estimated generalized least-squares method.

Table 7. Heteroscedasticity, Autocorrelation and Cross-Sectional Dependence Results

Test	**Results**	**Hypothesis**
Wald test	chi2 (22)= 7191.40 Prob> chi2= 0.000	H0: $\sigma_i^2 = \sigma^2$

Baltagi Wu LBI test	2.093	H_0: p=0
Durbin-Watson	1.902	H_0: p=0
Frees' test	Frees' test of cross sectional independence= 0.019, Critical values from Frees' Q distribution alpha= 0.10: 0.316; alpha= 0.05: 0.432; alpha= 0.01: 0.660	

Due to the heteroscedasticity problem, we should use the panel estimated generalized least-squares method. The results are displayed in Table 8.

Table 8. Panel EGLS Results

Dependent Variable: Exp

Method: Panel EGLS (Cross-section weights)

Variables	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
Shd	0.0780	0.0292	2.6661	0.0085
Lnd	-0.0381	0.0502	-0.7603	0.4483
Loan	0.1554	0.0488	3.1838	0.0018
Car	-0.1299	0.0246	-5.2735	0.0000
Roa	-0.6482	0.1677	-3.8655	0.0002
Intexp	0.5675	0.1425	3.9814	0.0001
Roe	0.2880	0.0742	3.8819	0.0002
Size	4.3972	0.9143	4.8089	0.0000
Exch	-5.0068	1.6953	-2.9532	0.0037
Cr	-0.0042	0.0072	-0.5844	0.5599
R-squared	0.3034	**Durbin-Watson Statistic**		2.2003
F-statistic	2.0232	**Prob (F-statistic)**		0.0000

The results obtained from the panel estimated generalized least-squares analysis in Table 8. According to the results in Table 8, except long-term debt and current ratio, all coefficients are significant at %1 significance level. According to the results, short-term debt, bank loan, interest expenses, return on equity and size affect export intensity positively. On the other hand, the results revealed that return on asset has a negative impact on export intensity. Moreso, current asset ratio and exchange rate have a negative effect on export intensity as well.

4. CONCLUSIONS

Export is the sources of firm's growth as well as economic growth through improving skill and knowledge set via learning by export. Thus, a vast number of empirical studies documenting the relationship between the firms and exporting performance. In these studies generally consider several internal and external factors that affect export performance, however, the financial structure has not been considered in previous studies. Due to the fact that these studies dismissed the effect of financial structure on export performance, the major contribution of this study is to consider this effect. In this paper, we scrutinized the relationship between export performance and financial performance using 24 manufacturing sectors in Turkey. We used a yearly data from 2008 to 2016. Further, we found out that the financial structure affects export intensity.

Our empirical results revealed that short-term debt and bank loans have a positive effect on export intensity consistent with prior researchers (Bartoli et al. 2014, Abor et al. 2014). These findings fortify that Turkish manufacturing sectors should finance their export activities via short-term debt and bank credits. Putting it differently, it can be stated that manufacturing sectors with better access to debt/bank credits are more likely to export. As a result, credit constraints and bank relations are prominent for the export performance of the firm.

We reveal that the firm size is crucial for export intensity by the reason that it has a decisive effect on export intensity. This result is consistent with current literature (Verwaal&Donkers 2001, Nazar&Saleem 2009, Greenaway et al. 2007, Pacheco 2017, Berman &Héricourt 2010, Wagner 1995, Wagner 2001). Large firms have opportunity to access resources easily, while small firms have not. Thus, small firms are exporting a lower share of their total sales due to limited resources (Wagner 1995, Wagner 2001, Bonaccorsi 1992).

Another crucial result of our study is that the current asset and return on asset have a negative impact on export intensity. On the other hand, exchange rate volatility has negative relation with export intensity. The point of the study is the financial structure of the firm is an essential determinant of the export performance. Hence, policymakers need to take precautions about credit constraints and volatility of exchange rate.

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