

The Effect of International Trading Activities of Firms on Their Financial Structure

Sinan Esen¹, Halil Simdi², Oylum Sehvez Erguzel³

¹Department of International Trade and Logistics, Sakarya University, Sakarya, Turkey

²Department of International Trade and Finance, Yalova University, Yalova, Turkey

³Department of International Trade, Sakarya University, Sakarya, Turkey

Correspondence: Sinan Esen, Department of International Trade and Logistics, Sakarya University, Faculty of Management, P101, 54187, Sakarya, Turkey. Tel: +90-264-2953206 E-mail: sinanesen@sakarya.edu.tr

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Abstract

This study aims to find out the impacts of international trading activities of firms on their capital structure and profitability by using panel data analysis of the manufacturing companies listed in Istanbul Stock Exchange (ISE) for the period of 2009–2014. For this purpose we analyzed 107 manufacturing firms that declared international trade and financial data figures. We observed an inverse effect of import level on the long-term debt ratio and the negative impact of export level on the profitability. Every one-unit increase in import ratio decreases long term debt ratio by 0.0764, and every one-unit increase in export ratio decreases profitability by 0.0517. According to empirical findings there is no effect of import level on the short-term debt ratio, shareholder equity ratio and profitability. At the same time there is no effect of export level on the long term debt ratio, short term debt ratio and shareholder equity ratio.

Keywords: capital structure, export level, import level, international trade, profitability

1. Introduction

After World War II, policies that have been applied to the liberalization of world trade gained momentum with technological advances, and by the 1980s world trade volume had increased rapidly. Hence according to the World Bank (2015), global exports between 1988 and 2014 increased 20 times while global imports increased 24 times.

With Krugman's (1979) contribution to international trade theory, countries understood that they had to take part in trading activities to benefit from economies of scale and market diversifications in part because of differences in technology and factor endowments. This is why many developing countries such as Turkey have implemented international trade policies to motivate companies to engage in trading activities.

Despite it is known that businesses tend toward international trade with the expectations of market diversification, getting rid of excess capacity, the effects of international trade on companies' profitability and leverage are the subject of debate in academic studies.

This study aims to find out the impacts of international trade activities of the companies on their financial structure from the perspectives of profitability and borrowing. For this purpose, we have analyzed the export and import and financial data of the companies operating in the manufacturing sector and listed in Istanbul Stock Exchange. This study distinguishes from others in the literature by its analysis of how both export and import data affect businesses' financial statements.

We have organized the remainder of this article as follows. Part 2 provides a literature review. Part 3 explains data and methodology. Part 4 describes our empirical findings, and Part 5 summarizes the results.

2. Literature Review

Welch and Luostarinen (1988) define internationalization as the increasing activities of firms in the international area. Export and import operations are among most important dynamics of these activities. Many studies have examined the effects of increasing internationalization on firms surviving in the globalized world. Some of these works focus on profitability and indebtedness of the companies.

The existing literature regarding the relationship between profitability and internationalization provide mixed results.

Qian and Li (2003), Qian, Yang, and Wang (2003), Kuivalainen and Sundqvist (2008), Kongmanila and Takahashi (2009), Kneller and Pisu (2010), Fryges, and Wagner (2010), Abor (2011), Wyrobek (2013), Okuyan (2013), and Vu, Holmes, Lim, and Tran (2014) argued for a positive relationship between export and profitability. However, no connection is found between profitability and export in the studies of Shaked (1986), Girma, Gorg, and Strobl (2004), Vogel and Wagner (2010), Grazzi (2012), and Temouri, Vogel, and Wagner (2013). In contrast, Kumar (1984), Lu and Beamish (2006), and Tunahan, Esen and Topal (2015) observed a negative relation between the profitability and the level of export of the companies.

Increasing volume of international trade and costs arising from engaging these activities have led to an increase in the needs of funds for the internationalized companies in the countries. Indeed, according to Chor and Manova (2012), export activities force the firms to demand external financing for the following cost reasons: i. the sunk and fixed costs of international trade, which include the costs arising from learning about the profitability of international export opportunities, product customization, complying with regulatory requirements of export markets, and obtaining and stabilizing foreign distribution networks. ii. need for working capital as a result of longer (between 30 and 90 days) international trade transactions. iii. the cost of insurance arising from risks of longer transactions.

Financial leverage emerges as a factor that affects a firm's decision to engage in trade. Baggs and Brander (2006) indicate a relationship between the decline in tariffs on import and export and the financial leverage of importing and exporting firms respectively. A reduction in tariffs on imports increases the financial leverage of importing firms, while a decrease in tariffs on export has an opposite impact on the financial leverage of the exporting firms. Chaney (2013) considers reliance on internal liquidity as a method for financing international trading activities, as information asymmetries between foreign markets can make finding potential domestic lenders difficult. A firm's increasing debt level to finance its purchases of assets can be seen as a factor that increases its financial leverage. Gorodnichenko and Schbitzer (2010), and Bellone, Musso, Nesta and Schiavo (2010), focus on the financing of international trading activities. They especially emphasize the financing of fixed costs of import and export.

Mansi and Reeb (2002), Goldman and Viswanath (2011), Joliet and Muller (2013) indicate that while export levels increase, firms have higher borrowing rates. Unlike studies of positive and negative impacts of internationalization on borrowing, Singh and Nejadmalayeri (2004), Wyrobek (2012), and Tunahan, Sututemiz and Esen (2014) find out no significant relationship between the level of export and that of borrowing.

Regarding studies of the relationship between multinational and local companies' debt structure; Hughes, Logue, and Sweeney (1975), Shapiro (1978), Lee and Kwok (1988), Burgman (1996), Kwok and Reeb (2000), and Lin and Hung (2012) indicate that the borrowing rate of multinational companies is lower than that of domestic companies. Greenaway, Guariglia and Kneller (2007) states that the debt ratio of exporting firms is less than that of non-exporting firms. Vithessonthi and Tongurai (2015) find that leverage has a negative impact on the performance of domestic firms' performance and a positive impact on firm's trading activities. Singh and Hodder (2000) find that multinational firms have different capital structures in different countries, because the high leverage ratios of those firms decreases the negative effect of taxes in countries with high tax rates. In addition, Park, Suh and Yeung (2013) indicate that multinational firms do not have lower financial leverage ratios than those of domestic firms when the firm-specific variables having impacts on financial leverage are controlled.

Empirical analysis implemented by Anderson, Loof, and Johansson (2008) for Sweden, Muuls and Pisu (2009) for Belgium, Castelliani, Serti, and Tomasi (2010) for Italy, and Altomonte and Bekes (2010) for Hungary indicate that firms that are two-way traders (i.e., that both import and export) are more productive and larger in size than firms that import or export only. Two-way trader firms have higher financial leverage than one-way trader firms. Zerria and Noubbigh (2015) confirm a positive relationship between a firm's financial leverage and its size and profitability. Nakhoda (2012) determines that the intensity of financial leverage does not inhibit firms which export only from becoming two way traders, but it does inhibit firms which import only or operate only within the national market to become two way traders.

The other studies focus on the relationship between international trading activities and some other factors. Manova (2008), Manova (2010) analyze the relationship between industry characteristics, external dependence, asset tangibility, and financial leverage with respect to international trading activities. The firm's debt ratio increases as the proportion of tangible assets increases with respect to the firm's total assets. The huge external dependency requires greater financial leverage and borrowing costs. In addition, Besedes, Kim, and Lugovskyy (2011) determine that firms in industries with high tangible assets must finance their investments through bank loans. As a result, they avoid investments involving large fixed costs, and their decisions to expand trading activities is a factor that increases their financial leverage.

Although much research has focused on exporters, relatively few studies have examined the subject in terms of the importer as Bernard, Jensen and Schott (2005) states that "given the increasing attention to exporters, it is surprising

how little work has considered the actions of importing firms. There are no systematic studies of the characteristics of importing firms in the U.S. or other developed economies". Researches regarding the effects of import on firms generally focuses on "learning-by-importing" and how the impacts of importing capital goods provides a means of knowledge and technology diffusion, which increases productivity (Anderson et al., 2008). Amiti and Konings (2007), Kugler and Verhoogen (2009), and Castelliani, Serti and Tomasi (2010) discuss the performance of importers who pay higher prices for inputs to obtain high quality outputs. The higher prices for inputs require importers to finance their assets with bank loans, one of the factors that lead to increased financial leverage.

3. Data and Methodology

This paper analyzed 107 manufacturing firms that declared international trade and financial data figures out of 155 that are traded at Istanbul Stock Exchange (ISE) for the period of 2009 – 2014 by performing panel data analysis.

Variables of the regressions are defined as follows:

STDR_{it} : Short term debt to total assets ratio of firm i in the period of t

LTDR_{it} : Long term debt to total assets ratio of firm i in the period of t

SER_{it} : Shareholder equity to total assets ratio of firm i in the period of t

ROS_{it} : Earnings before interest and taxes (EBIT) to sales ratio of firm i in the period of t

XI_{it} : Export to sales ratio of firm i in the period of t

MI_{it} : Import to cost of goods sold ratio of firm i in the period of t

The null and the alternative hypotheses of the regression models are:

H_{0a}: Export to sales ratio has no impact over short term debt to total assets ratio of firm.

H_{1a}: Export to sales ratio has impact over short term debt to total assets ratio of firm.

H_{0b}: Export to sales ratio has no impact over long term debt to total assets ratio of firm.

H_{1b}: Export to sales ratio has impact over long term debt to total assets ratio of firm.

H_{0c}: Export to sales ratio has no impact over shareholder equity to total assets ratio of firm.

H_{1c}: Export to sales ratio has impact over shareholder equity to total assets ratio of firm.

H_{0d}: Export to sales ratio has no impact over earnings before interest and taxes (EBIT) to sales ratio of firm.

H_{1d}: Export to sales ratio has impact over earnings before interest and taxes (EBIT) to sales ratio of firm.

H_{0e}: Import to cost of goods sold ratio has no impact over short term debt to total assets ratio of firm.

H_{1e}: Import to cost of goods sold ratio has impact over short term debt to total assets ratio of firm.

H_{0f}: Import to cost of goods sold ratio has no impact over long term debt to total assets ratio of firm.

H_{1f}: Import to cost of goods sold ratio has impact over long term debt to total assets ratio of firm.

H_{0g}: Import to cost of goods sold ratio has no impact over shareholder equity to total assets ratio of firm.

H_{1g}: Import to cost of goods sold ratio has impact over shareholder equity to total assets ratio of firm.

H_{0h}: Import to cost of goods sold ratio has no impact over earnings before interest and taxes (EBIT) to sales ratio of firm.

H_{1h}: Import to cost of goods sold ratio has impact over earnings before interest and taxes (EBIT) to sales ratio of firm.

or shortly; H₀: $\alpha_1 = 0$ and H₁: $\alpha_1 \neq 0$ |

We estimate the following regressions as follows:

$$STDR_{it} = \alpha_0 + \alpha_1 * XI_{it} + \varepsilon_{it}$$

$$LTDR_{it} = \alpha_0 + \alpha_1 * XI_{it} + \varepsilon_{it}$$

$$SER_{it} = \alpha_0 + \alpha_1 * XI_{it} + \varepsilon_{it}$$

$$ROS_{it} = \alpha_0 + \alpha_1 * XI_{it} + \varepsilon_{it}$$

Regression models also have been estimated by MI_{it} instead of XI_{it}:

$$STDR_{it} = \alpha_0 + \alpha_1 * MI_{it} + \varepsilon_{it}$$

$$LTDR_{it} = \alpha_0 + \alpha_1 * MI_{it} + \varepsilon_{it}$$

$$SER_{it} = \alpha_0 + \alpha_1 * MI_{it} + \epsilon_{it}$$

$$ROS_{it} = \alpha_0 + \alpha_1 * MI_{it} + \epsilon_{it}$$

It is necessary to check whether each variable has unit root. Therefore, panel unit root tests are commonly performed in the literature with regard to asymptotics according to sample size (N) and number of time periods (T).

Panel data sets usually face some problems such as heteroskedasticity, autocorrelation, and cross-sectional dependency because of the existence of cross sections. Levene (1960) revealed a heteroskedasticity test used when normal distribution assumptions are invalid. Also, Brown and Forsythe (1974) formulated a new test based on alternative local estimators. Levene’s test statistics for heteroskedasticity are as follows:

$$W_0 = \frac{\sum_i n_i (\bar{z}_i - \bar{z}_{..})^2}{(g - 1)} \div \frac{\sum_i \sum_j (z_{ij} - \bar{z}_i)^2}{\sum_i (n_i - 1)} \tag{1}$$

Where

$$\bar{z}_i = \frac{\sum z_{ij}}{n_i} \quad \text{and} \quad \bar{z}_{..} = \frac{\sum \sum z_{ij}}{\sum n_i} \tag{2}$$

Brown and Forsythe (1974) revealed two more test statistics in addition to W_0 . The first one (W_{50}) takes the median of X_{ij} instead of X_i . Second test (W_{10}) cuts 10% of X_{ij} instead of X_i .

Bhargava, Franzni, and Narendranathan’s (1982) Durbin-Watson (D-W) test and Baltagi-Wu’s (1999) locally best invariant (LBI) test check autocorrelation of data sets. The D-W test is realized under AR(1) condition by accepting $H_0: \rho = 0$ (there is no autocorrelation) and $H_1: \rho < 1$. The same null hypothesis is also used for LBI; however, LBI regresses residual of AR(1).

Lastly, Pesaran (2004) suggests a cross-section dependency (CSD) test under $N > T$ condition that is not estimated by the Breusch-Pagan lagrange multiplier test. The CSD test of Pesaran is as follows:

$$CD = \sqrt{\frac{2T}{N(N - 1)}} \left(\sum_{i=1}^{N-1} \sum_{j=i+1}^N \hat{\rho}_{ij} \right) \tag{3}$$

The Pesaran test statistic distributes as χ^2 . Monte Carlo simulations demonstrate that the Pesaran CSD test is better than the Breusch-Pagan LM test (Tatoglu, 2013).

4. Empirical Findings

Initially, even if the Pesaran (2004) CD_{LM} test has been accepted as a suitable unit root test, in essence, limited T (=6) decreases the confidence of the test results. On the other hand, T grows faster than the cross-sectional dimension. Therefore, we use Levin, Lee and Chu and Fisher Phillips-Perron panel unit root tests.

Table 1 demonstrates the results of unit root tests of variables:

Table 1. Panel Unit Root Test Statistics for All Variables

Variables	Panel Unit Root Tests		
	Levin, Lin & Chu	Fisher - PP	Stationary Level
XI	-37.47 (0.000)*	-12.06 (0.000)*	I(0)
MI	-40.96 (0.000)*	-12.76 (0.000)*	I(0)
STDR	-20.81 (0.000)*	-13.35 (0.000)*	I(0)
LTDR	-75.98 (0.000)*	-8.63 (0.000)*	I(0)
SER	-2.87 (0.002)*	-9.24 (0.000)*	I(0)
ROS	-100.02 (0.000)*	-18.49 (0.000)*	I(0)

Note. Results are statistically significant at 1%.

All variables of the dataset are stationary at level, and it is possible to estimate the regression model of variables. Regressions are estimated fixed or random model according to Hausman test results. Our regressions have been estimated with a random effect model. The Null and the alternative hypotheses of the Hausman tests are:

H_0 : Coefficients are estimated by a random effects model.

H_1 : Coefficients are not estimated by a random effects model.

Table 2 demonstrates the suitable regression models and Hausman test results.

Table 2. Hausman Test Results

Dependent Variable	Indep. Var. / Const.	Coef.	Prob.	Hausman Prob.	Wald. Stat.
STDR	XI	-0,0145	0,911		
	Constant	0,4015	0,000	0,9043	0,01
STDR	MI	0,1666	0,069*		
	Constant	0,3451	0	0,2457	3,30*
LTDR	XI	-0,0609	0,153		
	Constant	0,1632	0,000	0,2038	2,04
LTDR	MI	-0,0962	0,005***		
	Constant	0,1762	0	0,4058	7,91***
SER	XI	0,1267	0,262		
	Constant	0,4207	0,000	0,774	1,26
SER	MI	-0,0705	0,360		
	Constant	0,4786	0,000	0,391	0,84
ROS	XI	-0,0574	0,087*		
	Constant	0,0894	0,000	0,4374	2,93*
ROS	MI	-0,0157	0,591		
	Constant	0,0781	0,000	0,7979	0,29

Note. *, ** and *** denote successively significance level at 10%, 5%, and %1.

Our random effect model equations estimate the impact of XI over ROS and MI over STDR and LTDR. In addition to random effect model estimation, empirical studies still ignore heteroskedasticity, autocorrelation consistency, and cross-sectional or “spatial” dependency (Hoechle, 2007). Therefore, we should test our data sets in terms of heteroskedasticity, autocorrelation, and cross-sectional dependency. Table 3 demonstrates the results of our data sets by taking heteroskedasticity, autocorrelation, and cross-sectional dependency into account.

Table 3. Heteroskedasticity, Autocorrelation, And Cross-Sectional Dependency Results

Dep. Var.	Indp. Var.	L-B-F	D-W*	LBI*	CSD	Results
STDR	MI	W0 = 7.42 (0.000)	1.45	1.818	1.711 (0.087)	Heteroskedasticity = Yes Autocorrelation = Yes CSD = Yes
		W50= 5.57 (0.000)				
		W10= 7.42 (0.000)				
LTDR	MI	W0 = 9.87 (0.000)	1.457	1.734	9.382 (0.000)	Heteroskedasticity = Yes Autocorrelation = Yes CSD = Yes
		W50= 2.15 (0.000)				
		W10= 9.87 (0.000)				
ROS	XI	W0 = 4.90 (0.000)	2.074	2.258	4.04 (0.0001)	Heteroskedasticity = Yes Autocorrelation = No CSD = Yes
		W50= 1.25 (0.059)				
		W10= 4.90 (0.000)				

Note. * Critical value of D-W and LBI is 2.

Test results demonstrate that estimations of STDR and LTDR via MI have heteroskedasticity, autocorrelation consistency, and cross-sectional dependency problems whereas estimation of ROS via XI has heteroskedasticity and cross-sectional dependency problems. According to Tatoglu (2013), the existence of all three problems leads to the use of Driscoll and Kraay's (1998) estimator under $N > T$ condition for short and long term debt estimation of import ratio. Driscoll and Kraay (1998) formed a nonparametric covariance matrix estimator that gives heteroskedasticity and autocorrelation consistent standard errors that are resist to cross-sectional dependency. On the other hand, Beck-Katz's (1995) estimator as the most suitable method to estimate ROS and XI regression under heteroskedasticity and cross-sectional dependency problems. Table 4 shows the estimated regression models.

Table 4. Estimated Regression Models

STDR	Coefficient	Drisc/Kraay Std. Err.	t score	Prob.	R-Squared	Model Prob.
MI	-0.015	0.0426	-0.37	0.724	0.0001	0.7242
Constant	0.402	0.0169	23.75	0.000		
LTDR	Coefficient	Drisc/Kraay Std. Err.	t score	Prob.	R-Squared	Model Prob.
MI	-0.0764	0.0165	-4.63	0.006*	0.014	0.0057*
Constant	0.1699	0.0187	9.06	0.000		
ROS	Coefficient	Panel Correct. Std. Err.	z score	Prob.	R-Squared	Model Prob.
XI	-0.0517	0.21	-2.46	0.014**	0.0062	0.0138**
Constant	0.0878	0.00668	13.14	0		

Note. * and ** denote that models are statistically significant at 1% and 5%.

According to empirical findings, the short-term debt regression model is not valid after the Driscoll and Kraay estimation. On the other hand, long-term debt and profit regression models protect its validity with suitable estimators. Every one-unit increase in MI decreases LTDR by 0.0764, and every one-unit increase in XI decreases ROS by 0.0517.

5. Results

This study examines the impact of the export and import levels of the manufacturing companies listed in the Istanbul Stock Exchange on short-term debts, long-term debts, shareholder equity, and profitability. According to the empirical findings, there is an inverse relation between import and long term debts; the same relation also exists between export and profitability. But the relation between import and long term debt can not give strong result because of no relation between import and the other factors. If we found an inverse relation between import and long-term debts and a positive relation between import and short-term debts or shareholder equity, we would have achieved a viable result. However, the impact of import on long-term debt alone is not enough to reach a definitive conclusion.

However the effect of exporting level on companies' profitability give us strong result. Every one-unit increase in the export ratio decreases the profit ratio by 0.0517. This result is similar to the findings of Kumar (1984), Lu and Beamish (2006), and Tunahan et al. (2015). It does not necessarily mean that while the export ratio of businesses increases, their profits nominally decrease. In addition to this, firms can increase their profits nominally by increasing their exports; however, the share of profit in sales decreases because exporting firms incur an additional production and marketing cost to enter and keep overseas markets.

The firms in the Turkish manufacturing sector are unable to produce high-tech and high value-added products. For this reason, they may find that the only way to increase their sales in international markets is by maintaining the current quality and reducing their profit margins.

Decreasing profitability along with an increasing export level seems to be worse position for the companies. However, it should be noted that exporters benefit from the diversification of exporting markets and in this way can decrease their sales risk in comparison with local firms. Severe competition conditions in international markets force firms to specialize and produce more quality products. Operating in overseas markets also has positive effects on brand awareness. Analyzing firms that operate in different sectors and the impacts of their trading activities on their financial structures could pose an interesting potential research question. Finally, examining the other effects of the international trading activities of businesses will also contribute to the existing literature.

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