HETEROGENEOUS EFFECTS OF FINANCIAL INDICATORS ON FIRMS' EXPORTS: EVIDENCE FROM TURKISH MANUFACTURING FIRMS

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ABSTRACT

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Using an extensive firm-level database that combines customs and balance sheets data, this paper investigates the heterogeneity in the effects of financial indicators on the exports of Turkish manufacturing firms. The panel data estimations for the period 2010-2020 suggest that improvement in the firm-level financial indicators have stimulating effects on the firms' exports. More specifically, it is found that profitability and liquidity ratios are positively associated with firms' exports, while increases in the leverage ratios hinder the export performances. Estimation results also reveal that, bank loans support the exports of firms that are able to have access to those loans. In this regard, the study demonstrates that firm characteristics are sources of heterogeneity for the export performances. The effects of financial indicators along with real exchange rate and foreign demand on real exports are shown to differ depending on firms' size, age (experience), permanence in exporting, technology intensity of production, the degree of imported input intensity and the level of foreign ownership.

Keywords: Exports, Firm Heterogeneity, Financial Indicators

ÖZ

FİNANSAL GÖSTERGELERİN FİRMA İHRACATI ÜZERİNDEKİ HETEROJEN ETKİLERİ: TÜRK İMALAT FİRMALARINDAN DELİLLER

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Gümrük ve bilanço verilerini birleştiren firma düzeyinde kapsamlı bir veri tabanı kullanan bu makalede, finansal göstergelerin Türk imalat firmalarının ihracatları üzerindeki etkilerindeki heterojenlik incelenmektedir. 2010-2020 dönemine ilişkin panel veri tahminleri, firma bazında finansal göstergelerdeki iyileşmenin firmaların ihracatını teşvik edici etkilerinin olduğunu göstermektedir. Daha spesifik olarak, karlılık ve likidite oranlarının firmaların ihracatı ile pozitif ilişkili olduğu, kaldıraç oranlarındaki artışların ise ihracat performanslarını kısıtladığı tespit edilmiştir. Tahmin sonuçları ayrıca, banka kredilerinin bu kredilere erişimi olan firmaların ihracatlarını desteklediğini ortaya koymaktadır. Bu bağlamda çalışma, firma özelliklerinin ihracat performansları açısından heterojenlik kaynağı olduğunu göstermektedir. Finansal göstergelerin yanı sıra reel döviz kuru ve dış talebin reel ihracat üzerindeki etkilerinin firmaların büyüklüğüne, yaşına (deneyimine), ihracatta kalıcılığına, üretimin teknoloji yoğunluğuna, ithal girdi yoğunluğunun derecesine ve yabancı sahiplik oranına bağlı olarak farklılık gösterdiği gösterilmektedir.

Anahtar Kelimeler: İhracat, Firma Heterojenliği, Finansal Göstergeler

To My Family

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CHAPTER 1

INTRODUCTION

Following the introduction of firm heterogeneity as a new route to better understand the dynamics of global trade at the microeconomic level and advancement in computational capabilities, empirical research into the relationship between firm heterogeneity and firms' export behavior has grown markedly in the recent years. Some of those studies have investigated the determinants of firms' decision to participate in the export market from a perspective of ability to overcome the fixed costs associated with exporting, while some others have explored the heterogeneities in already exporting firms' export performances. It should be noted that both the extensive and intensive margin approaches put productivity differences at the heart of their analyses, claiming that only highly productive firms can cover the fixed costs related to exporting and productivity increases lead to better exporting performances. The assumption that there is no heterogeneity in financial structures of firms or that the financial markets are perfect, keeping all other variables constant, implies that all firms with productivity above a certain threshold will most likely engage in exporting. However, in reality, the financial indicators of the firms should matter, as the financial markets are imperfect and only less financially constrained firms may be able to secure enough resources to overcome the additional costs and investments which exporting incurs. The existence of highly productive non-exporting firms or less productive exporting firms confirms this theory as well. Based on this fact, studies have emerged more recently that investigate firms' financial structures as an additional source of firm heterogeneity to better understand the export dynamics at the micro level. Despite the fact that the relationship between firms' financial constraints and their exporting behaviors have been fairly well documented in the international literature, Turkish firms have been relatively less investigated and this relationship is still not fully understood. Furthermore, while those already limited studies may have incorporated

some firm-level financial indicators to their export models, to the best of our knowledge there is no study that puts financial dimension of the firm heterogeneity at the center of the analysis.

With this motivation, in this paper we focus on the relationship between financial indicators and the exporting performances of the Turkish firms. In line with the literature and due to the fact that majority of Turkey's exports are provided by the manufacturing sector, in this paper only the manufacturing firms are analyzed. Accordingly, we investigate the determinants of manufacturing firms' export decisions at the intensive margin by trying to show whether better financial structure leads better export performance. We also examine how differently firms' financial indicators along with macro variables affect export performances across different firm groups.

To this aim, we exploit an extensive data set and estimate an econometric model using a panel of 195,408 firm-year observations, consisting of 42,385 individual firms over the period 2010-2020. Previous empirical studies provide guidance for the variable selection. In this regard, we use profitability ratios of returns on assets (ROA) and returns on equity (ROE) ratios along with leverage, liquidity and bank loans to total liabilities ratios as the firm-level financial indicators. Firms are expected to get financially less constrained as the liquidity and profitability ratios increase and leverage ratios decrease, while the bank loans ratio is considered as an indicator of the ability to access to external finance. In this paper we incorporate those financial indicators into a standard export model in which the exports are explained by real exchange rate and foreign demand.

In line with the findings of the pioneer studies of Chaney (2007) and Bellone et al. (2010), the empirical results of our study provide evidence for the Turkish economy that financial dimension presents an additional source of firm heterogeneity and improvement in financial indicators enhances export performances of the firms. More specifically, we find for the whole sample that while profitability has the most augmenting effect, ease of access to bank loans and improvement in liquidity conditions have also positive and statistically significant effects on the manufacturing firms' real exports. Increase in the leverage or indebtedness ratio on the other hand is

found to be affecting export performances negatively. The findings are also consistent with the macro theory in the sense that real depreciations in the Turkish Lira and increases in the foreign demand are found to affect Turkish manufacturing firms' real exports positively as indicated by the international trade theory.

The comprehensive data set allows us to make further contribution to the literature by exploring the heterogeneity in export performances in more detail. As decomposing exporting manufacturing firms into different groups considering firm size, permanence in exporting, age (experience), technology intensity of production, the degree of imported input intensity and the level of foreign ownership, we show how differently financial indicators and macro variables may impact the real exports across those sub-groups of firms. Accordingly, some groups of firms' exports are found to be more positively affected by the improvements in financial indicators, while some firms are shown to be more responsive to fluctuations in exchange rate and global demand conditions.

In that context, our study not only contributes to the firm-level heterogeneity literature in Turkey, but also may shed light upon the design of necessary firm-oriented policy implementations for the aim of achieving structural improvement in aggregate exports. That is, we believe that better understanding the firm-level dynamics of export decisions may help policy makers pursue more selective and success-oriented policies to promote exports and direct the already scarce financial resources to the firms which would yield the most efficient results.

Rest of the study is organized as follows. In the following chapter, we present a review of the literature on the heterogeneity in firms' export behaviors with a focus on the effects of financial indicators and summarize the findings of the limited studies on Turkey. In the third chapter, a short overview of the exports in Turkey for the analysis period of 2010-2020 is presented. Chapter 4 introduces the data and empirical methodology used in this paper. In chapter 5 we present the empirical results for the whole sample and the sub-groups of firms, then discuss the roles played by financial indicators and macro variables in shaping the export performances in detail. The last chapter concludes and draws some policy implications.

CHAPTER 2

LITERATURE REVIEW

Since Bernard and Jensen (1999), one question has dominated the literature on firm export behavior: what is the direction of causality between exporting and firm performance? The self-selection versus learning-by-exporting debate has tried to determine whether the best-performing firms choose to become exporters or whether choosing to export makes firms perform better. According to one point of view, in order to export, firms need to bear additional sunk costs such as transportation and marketing and those investments can only be covered by "best-performing" ones. According to this viewpoint, known as the self-selection hypothesis, causality runs from performance to exporting. Firms that are exposed to export markets, on the other hand, face increased competition, according to the other point of view. When the firms join the export market, they learn how to deal with fierce competition, which leads to faster improvement in performance metrics. Therefore, the learning-by-exporting hypothesis claims that engaging in exporting activities enhances firm performance and points to the opposite direction of the causality, from exporting to performance. Although many studies have been done on this subject, the literature has not managed to reach a consensus on the either way.

Using data on Italian manufacturing firms, Castellani (2002) argues that the more the firm's orientation toward international markets, the greater the firm's productivity increase as they are likely to benefit from their international contacts, gaining knowledge and technology at a faster rate. Analyzing the Canadian firms, Baldwin and Gu (2004) state that after the establishment of the North American Free Trade Agreement (NAFTA) more Canadian firms entered the export market and exporters increased their export shares. They show that export-market participation led to higher productivity growth due to increases in competition, plant specialization and learning

by exporting. Similarly, Kneller and Pisu (2010) utilize survey data for the UK and find that the majority of firms engaged in export market report improvements across various performance measures, including size, profitability, and the introduction of new products. Concerning developing countries, Aw et al. (2000) claim that export-market participation may not automatically boost productivity in each country example and report evidence supporting the existence of learning-by-exporting in Taiwan, but not in South Korea.

The pioneer works of Clerides et al. (1998) and Bernard and Jensen (1999) on the other hand, find no evidence of a learning effect and suggest that best-performing firms do self-select into export markets. Accordingly, the first study concludes that the cause of the performance differences observed between exporters and non-exporters in Colombia, Mexico and Morocco is dedicated to the self-selection of the more productive firms, while the latter finds the same evidence for the US firms. Covering 54 empirical studies for 34 countries Wagner (2007) gives detailed survey for the literature of export behaviors of firms and shows that the general finding gives evidence that exporters are better performing and those better firms self-select into the export markets. Hence, it can be concluded that self-selection hypothesis is more commonly accepted perspective regarding the superiority of the exporters.

Another point that needs to be discussed is the concept of "better firms" itself. So far, the literature on firm-level trade has mostly focused on the relationship between exports and productivity. That is, from the learning-by-exporting perspective, some researchers have tried to show that exporting increases firm productivity on average. Following the more common perspective of self-selection hypothesis others have tried to give evidence that more productive firms self-select to become exporters and since firms' productivity levels vary, it is claimed that they all have a unique capacity to deal with the sunk costs involved with exporting. However, the productivity differences may not be the sole reason behind the heterogeneity in export performances. That is, controlling for the productivity variations, there might be other crucial firm-level characteristics that may be effective in this heterogeneity. Accordingly, there have been various studies that consider the financial condition of the firms and the credit or financial constraints they face along with wide range of firm-level characteristics such

as size, age, continuity in exporting and the degree of integration to the global value chains (GVC).

Muûls (2008) argues that export decisions cannot be based entirely on productivity factors since even if some firms are productive, they may not be able to engage in exporting activities as they are financially constrained. She claims that those constraints, in particular, will have an impact on export volumes and patterns. More specifically she shows that firms are more likely to be exporting if they enjoy higher productivity levels and lower credit constraints.

Following the heterogeneous firm framework of Melitz (2003) which asserts that only the most productive firms are able to overcome fixed costs associated with exporting, Chaney (2007) incorporates liquidity constraints into this model and conclude that they have an impact on firms' export decisions. He shows that those liquidity constraints interact with productivity heterogeneity and states that the most productive firms may generate enough liquidity from domestic sales to overcome any liquidity constraints associated with exporting. However, he stresses that some less productive firms would be profitable enough to export, yet they may be prevented from doing so since they are liquidity constrained. Finally, regarding the direction of causality he claims that it is because they are less liquidity constrained that some firms are able to export, and not the reverse.

On the other hand, in their heavily cited paper Greenaway et al. (2007) utilize data for UK manufacturing firms and introduced a financial dimension of firm heterogeneity to investigate why some firms engage in exporting activities, while others do not. In line with the literature, they show that exporters are financially healthier than the non-exporters both unconditionally, and conditional on firms' characteristics such as size. However, they find no evidence to support the premise that less constrained firms self-select towards exporting and instead conclude that exporting exerts a positive effect on firm financial health. That is, they claim that the causal relation between the two variables runs from exporting to financial health.

Bellone et al. (2010) assert that as the firms must pay significant sunk costs to penetrate the export markets, firms that do not have sufficient finances may struggle to reach international clients, meaning that only firms with less constraints will be able to begin exporting. Moreover, they do not find significant improvement in the financial health of firms entering the export markets contrary the results reported in studies such as the Greenaway et al. (2007).

At this point, it is also necessary to clarify how the degree of credit or financial constrains are measured and which financial indicators are utilized in the literature to assess the financial situations of the firms. Most studies use a set of variables to determine the existence of credit constraints. These variables are chosen to capture the sources of information asymmetries that can prevent firms from accessing capital markets and finance their exporting activities. Moreover, firms are generally placed in two different groups on the basis of some arbitrary threshold, such as mean or median values, while in some studies firms are examined in more than two groups by separating them according to different quantiles.

Fazzari et al. (1988) state that only the firms that have healthy balance sheets can afford high dividend payments and thus claim that high dividend payouts are a signal that the financial constraints are not present for the firms. Musso and Schiavo (2008) on the other hand, underline that a single variable may not effectively identify the existence of financial constraints and argue that seeing this as a clear-cut phenomenon that either exists or not, without allowing for different degrees may be misleading. Accordingly, they construct an index, comprising information from seven different variables, which are chosen based on their success in previous research and their anticipated relevance in determining the ease of access to external finance. Those are namely, size, liquidity (current assets over current liabilities), profitability (return on total assets), cash flow generating ability, solvency (own funds over total liabilities, measuring the ability by a firm to meet its long-term financial debt), repaying ability (financial debt over cash flow) and commercial credit over total assets.

In order to create a continuous measure of financial constraints, Cleary (1999) pursues a multiple discriminant analysis and develop a score based on six variables, which are

namely the current and debt ratio, the net income margin, the fixed charge coverage, sale growth, and slack over total assets. Similarly, Lamont et al. (2001) build an index by using weighted regression coefficients of different variables such as cash flows to fixed assets, debt to total assets, market to book ratio and dividends to fixed assets.

In the rest of this section, we will present the findings of distinguished studies regarding the effects of different firm-level financial variables that are used in our analysis, first for different country examples and then for the Turkish case.

In order to quantify the effects of liquidity on firms' export decisions, Forlani (2010) uses the ratio of the total amount of internal resources (equity plus cash flows) and the total amount of capital invested (total assets) and name this ratio as Financial Independency Index. Following the fact that as limited access to financial sources causes investment constraints and one can consider costs due to engaging in export activities as an investment, he finds that internal resources play an important role in shaping the exporting decisions of firms.

Campa and Shaver (2002) present evidence of the relationship between export status and liquidity constraints for manufacturing firms in Spain in the 1990s, while Caggese and Cunat (2013) argue that firms decide to export according to their accumulated sources and their idiosyncratic demand shocks.

Greenaway et al. (2007) point out that exporters display higher liquidity ratios and lower leverage ratios. In their study, they present 12 regression results, 9 of which indicate a positive coefficient for liquidity ratio and negative coefficient for leverage ratio. They argue that continuous exporters enjoy better financial health in terms of these ratios, suggesting that participation in export markets improves firms' ex-post financial health.

Using a panel of 3,353 Korean firms for the period 1994-2011, Kim (2016) analyzes the effect of leverage on the firms' export performances by separating the firms into two groups according to being financially constrained or not. To this aim, she utilizes liquidity ratio and the interest coverage ratio as the criteria for the financial constraints,

and split the sample into two sub-samples according to the yearly median value of those ratios. She finds that leverage for financially-constrained firms is negatively related with exporting, while the effect of higher leverage for financially-unconstrained firms is found to be positive. She argues that leverage works as a financial burden for the financially constrained firms, while for financially unconstrained firms, leverage means as a way to enjoy various advantages such as tax benefits of debt financing, and hence the firms' exporting activities are not necessarily negatively associated to leverage. In line with the self-selection hypothesis, she further shows that among the high-liquidity firms, future exporters have lower leverage before they begin to export.

Regarding the relation between profitability and export performance, it should be noted that researchers tend to substitute profitability for productivity in the financing constraints literature. Fryges and Wagner (2010) for instance assert that from a theoretical standpoint profitability rather than production is more relevant in analyzing firm export dynamics. They argue that even though productivity and profitability are positively correlated, productivity is only one of numerous unique characteristics that influence profits and profitability is critical to a firm's success. Using firm-level data for Germany, they show that exporters are significantly more profitable relative to non-exporters, while they do not find any evidence for self-selection of more profitable firms into export markets.

Using two parallel data sets spanning Dutch firms from 2002 to 2010 and Finnish firms from 2005 to 2010, Tamminen et al. (2016) analyze the link between trade status, firm size, and profitability using four distinct profit metrics. More specifically, they utilize gross profit margin, net profit margin, return on assets (ROA) and gross profits per employee and find evidence for a positive relation between exporting and profitability in the Netherlands, while they do not find such a significant relationship for the Finnish case. Similarly, Kox and Rojas-Romagosa (2010) show that profitability in exporting firms is higher and that more profitable self-select into exporting even after controlling for sector and firm-specific characteristics.

Access to financial loans is a key challenge for firms especially in emerging countries with shallow stock markets. As Bernanke and Blinder (1988) state, in the classical credit transfer mechanism, companies' access to external resources is limited to banking system and capital markets. According to the bank loan channel approach, which assumes that the alternative financing source for firms that cannot borrow from capital markets is mostly bank loans, the loans provided by banks to firms are limited especially in periods when financial conditions are tight, and this situation has a narrowing effect on the real activities of companies that do not have the opportunity to access an alternative external source for bank financing. Accordingly, Ozbay-Ozlu and Yalcin (2010) find that, in Turkey unlike large firms, small firms cannot obtain sufficient resources from the banking system, especially in times of economic downturns. Hence it can be expected that access to bank loans may create a heterogeneity in export performances of firms. In that context, one can expect that bank loans to total assets ratio has a positive relation with the overall exports of especially large firms, which are able to access those loans.

It should be once again noted that researchers have placed firms in different groups on the basis of various non-financial firm characteristics, such as firm size, age, permanence in exporting, foreign ownership and the degree of technology and import intensity with the motivation to show whether heterogeneity according to those indicators might lead to heterogeneity in firms' export performances.

Fryges and Wagner (2010) for instance show that firm size has a significantly positive effect on the export–sales ratio. They also report significantly negative sign of the squared value of the number of employees, which indicates that the export–sales ratio tends to increase with firm size at a decreasing rate. Kumar and Siddharthan (1994) show that the firm size and export performance relation is found to be predominantly inverted U-shaped. Musso and Schiavo (2008) assert that big and experienced firms are likely to find easier access to external funds, as it should be easier to collect information on them compared to young and small firms, hence they may finance their exporting activities in a relatively easier way.

Regarding the effects of being a permanent exporter, Greenaway et al. (2007) reveal that a higher liquidity and a lower leverage ratio on average are associated with a higher probability of being a continuous exporter, while starters generally display a poorer financial health. Thus, they conclude that being a continuous exporter seems to lead to better ex-post financial health. McQuoid and Rubini (2014) show that on average, perennial exporters produce 140 percent more than non-exporters, and transitory exporters produce 62 percent more than non-exporters, in line with the fact that perennial exporters are on average larger than non-exporters.

There are also studies which cover the heterogenous effects of being integrated to the global value chains (GVC). Regarding the effects of being partly or fully owned by foreigners, Bridges and Guariglia (2008) analyze UK firms and investigate the interrelations between global engagement (of which export is just one possible manifestation), financial health and survival. They discover that lower collateral and higher leverage lead to increased failure probabilities, yet only for fully domestic owned firms. They take this as evidence that internationalization protect firms from financial constraints. Therefore, the impact of financial factors on firm exports can be expected to be higher for purely domestic firms. Manova et al. (2015) demonstrate that foreign affiliates and joint ventures in China outperform private domestic firms in financially more risky sectors. They find that multinational subsidiaries are financially less constrained as they can access foreign capital markets or funding from their parent companies. Accordingly, they claim that FDI can alleviate the impact of domestic financial market imperfections on firm exports. Tamminen and van den Berg (2013) on the other hand, show that multinational firms have generally a higher skilled and more productive workforce, which may be expected to result in higher coefficients for the number of employee variable in the firm-level export models. They further argue that the net effect on firm-level profitability is uncertain due to the mix of greater revenues associated with access to a broader market and higher labor costs.

Zaclicever (2019) argues that the competitiveness gains of GVC involvement are associated with the effective intermediate input sourcing. She claims that access to more differentiated, competitively priced, and higher-quality imported inputs, in particular, can play a major role in improving export competitiveness. To this aim, she

investigates the Chilean case and shows a positive relation between the use of imported intermediate inputs and export performance. Ahmed et al. (2016) assert that as this increased vertical integration to GVC has led increased worldwide use of imported intermediate inputs, the exchange rate elasticity of exports has decreased significantly on the global scale. Using Belgian firm-level data, Amiti et al. (2014) shows that increased share of imports in total costs can significantly reduce the exchange rate pass-through. They find that as the import intensity is highly skewed towards the largest firms, due to the marginal costs channel these large exporters have pass-through around 50 percent, while small nonimporting firms are found to have almost complete pass-through.

Lastly, as the studies on the effects of integration to the GVC also reveal, quality is considered as an important prerequisite in exporting since it is assumed that export markets require higher quality products. Technology usage and innovation are among the main requirements for obtaining quality production. In that context, firms with different technology intensities may react to macro-level changes such as fluctuations in the exchange rates differently and the financial indicators may have different implications for the firms in different technology groups. Using firm level data for UK and German manufacturing firms, Roper et al. (2002) give evidence that innovation is positively associated with propensity to export for both countries. Utilizing UK sector-level data, Greenhalgh et al. (1994) show that innovative industries are generally net exporters rather than net importers. They conclude that the price elasticities of exports in more innovative, higher technology intensive sectors are expected to be lower, while the income elasticities are expected to be higher. Rodríguez and Rodríguez (2005) on the other hand examine Spanish manufacturing firms and show that the decision to start exporting is primarily determined by the firm's internal features rather than the industry in which the firm operates. However, they show further that once a firm has begun to export, being in a high-tech sector supports the exporting process due to technical spillovers within the industry, externalities, and accumulated experience, allowing the firm to strengthen its technological capacity and hence its competitiveness.

2.1. Studies on Turkey

Despite the importance of exports for the Turkish economy and contrary to the growing and enriching empirical literature on firm-level export behavior, the applications for Turkey have been somewhat limited. Using various firm-level data, some studies investigated the validity of learning-by-exporting hypothesis, while others examined export market participation decisions of firms within the self-selection framework. In the latter group of studies, some studies focus on the exporting decisions at the extensive margin, while some others focus on the intensive margin or both. That is, some researchers have been trying to show whether firm-level characteristics affect Turkish firms' decisions to enter the export markets, while some have been investigating whether firm-level characteristics have influence on already exporting firms' export volumes.

Conducting a firm-level study on Turkish manufacturing firms for the period 1989-2010, Atabek-Demirhan (2015) investigates export behaviors of the firms with a dynamic discrete choice model and data obtained from Central Bank of the Republic of Turkey (CBRT) Company Accounts dataset. In this study, she shows the superiority of exporters compared to non-exporters in terms of various performance measures. Then, she investigates whether learning-by-exporting and self-selection hypotheses are valid for the Turkish case. To this aim, she utilizes selected performance measures, such as size, productivity, capital intensity, profitability, credit constraints, liquidity, marketing and R&D expenses as dependent variables. Accordingly, first she uses simple regression and calculates exporter premium (the percentage difference of performance measure between exporters and non-exporters) for each of the performance measures. By doing so, she shows that Turkish manufacturing sector exporters are found to be larger, more productive, more capital-intensive, more quality oriented, more profitable, more liquid and less credit constrained compared to their non-exporter peers.

Concerning the sources of this superiority, she utilizes Propensity Score Matching Difference-in-Difference (PSM-DID) approach for testing the validity of learning-by-exporting hypothesis and concludes that engaging in exporting activities results in

improvements in size, productivity and financial health of the firms. Then, in order to test whether the self-selection hypothesis holds, she uses the lags of the performance measures (pre-entry export premiums) at the period t-1 and regress them to export dummy which takes the value of 1 if the firms starts to export at time t, along with a number of variables to control for the time, sector, region fixed effects and capture the effects of time-varying macro variables. The estimation results reveal that those pre-entry export premiums are positive and statistically significant, indicating that future exporters are on average larger, more productive, more capital intensive and less credit constrained in the pre-entry period, supporting the self-selection hypothesis.

Akhan et al. (2018) investigates the heterogeneity in the responses of export volumes to real exchange rate changes using firm-level data for the manufacturing firms obtained from TURKSTAT for the period 2007-2014. In this study, they focus on the heterogeneity due to the productivity and import intensity differences among firms. To show that they use logarithms of firm-level export volumes as dependent variable, while regressing them to bilateral real exchange rates, productivity levels (defined as the hourly production value), ratio of imports to total trade at the firm level as a proxy for import intensity and fixed-effect variables to control for the time and time-invariant sector or destination characteristics. Accordingly, they confirmed that a real depreciation in the Turkish Lira has a positive effect on export volumes on average. However, they showed that firms react to exchange rate changes differently as the firms, which rely predominantly on imported inputs may not benefit from depreciations as much as the firms with lower import intensities. They further showed that productivity has a positive effect on firm export volumes, regardless of the degree of import intensity.

By considering FX exposures and various firm characteristics, Karamollaoglu and Yalcin (2020) investigate the relationship between the real exchange rates and exports shares of Turkish manufacturing firms as well. To this end, they use a panel of 4872 firms and carry out an empirical analysis for the period 2002–2010. In their model, they use foreign sales as the dependent variable, while using the log of sectoral real exchange rates, industry-level foreign demand, domestic output, VIX index as a measure of macro-volatility, two-digit industry output growth rate to control for

industry-level shocks and firm-level variables such as size, labor productivity, leverage, collateral and liability dollarization ratios. The results indicate no statistically significant link between leverage ratio and export shares, while negative and significant relation for collateral ratio. They also find that productivity and the relatively high share of FX denominated debt are supportive for exports, as the latter is an indicator of the ability to access long-term and lower cost loans mitigating the credit-constraints. Their results reveal on the other hand that a real depreciation of the Turkish Lira affects exports (foreign sales) positively. However, they argue that this positive effect is muted for firms which have high liability mismatch and/or are operating in more import intensive sectors. They further claim that responsiveness to exchange rate fluctuations does not vary between different size categories, while the changes in the exchange rates affect younger firms at a greater magnitude. Another finding of their paper is that a slowdown in domestic activity seems to motivate firms to export.

Akdogan et al. (2021) on the other hand examine the heterogeneous effect of exchange rate changes on firms with varying degrees of labor-intensity of production. They argue that this heterogeneity could be due to the cost of capacity expansion adjustment, the persistence of exchange rate shocks, or a low ratio of intermediate goods in production. To this aim, they employ an econometric model in which they take the annual change in logarithm of firm exports as the outcome variable. As for the explanatory variables, they utilize an interaction term between the annual log change in real effective exchange rate (REER) and the labor-intensity dummy, which takes the value 1 if the weighted mean of the unit labor cost of firms in a product category is above the median unit labor cost across product categories, along with annual change in world exports in that product category and variables to control for initial sizes and year fixed effects. Accordingly, they find that a real depreciation in the Turkish Lira affect the exports of labor-intensive firms more positively relative to those of other firms, both at the intensive and extensive margins. Moreover, they show that a real depreciation increases the export product and export market diversity of labor-intensive enterprises more than others.

Investigating the substitutability between domestic and foreign sales with an unbalanced panel of 6286 firms with 27567 firm-year observations for the period 2004-2014, Gul (2021) carries out an empirical analysis in which he utilizes balance sheets data and takes firm-level real foreign sales as the dependent variable. As for the explanatory variables he uses firm-level real domestic sales, lagged real inventories, sector-level price differential between exporting and selling in domestic markets, dummy variable that takes the value 1 if a firm exports each year during the period, along with firm-specific control variables, such as size, age, leverage, profitability and cash ratios. Apart from revealing that domestic sales and exports are substitutes to each other, the empirical findings also yield that firm specific characteristics matter for the export performances. More specifically, although the coefficient of the leverage ratio is not found to be statistically significant, indicating that the level of indebtedness does not constrain firms' foreign sales, the cash ratio (an indicator of the level of firms' short-term liquidity) is found to affect the export performance positively. He stresses that the leverage ratio indicates the external financing constraints, while cash flow is associated with the internal financing constraints. Thus, he claims that the empirical findings still present some evidence regarding the limiting effect of financing constraints on exports. He also shows that profitability ratio has a positive and statistically significant effect on exports, implying that if a firm is more profitable, on average it will export more.

In addition to financial indicators, Gul shows that firm size and age are important determinants of exports. He finds that the larger a firm is, the more it can produce and export, as the larger firms can cover the additional costs due to exporting relatively easier. He further argues that older exporters export more as they generally have a long history of exporting, which helps constructing longer-term relationships with their customers. Moreover, he asserts that the older firms might be a part of a foreign firm's supply chain, which might bind them to certain consumers and make them less reluctant to adapt to short-term differences. In that regard, while he does not statistically test it, he argues that being a multinational firm or foreign ownership can make the firms react to the short-term fluctuations less as they generally make their investment plans in longer horizons. Hence, it can be expected that the short-term fluctuations in the foreign demand, real exchange rate and firm-level financial

indicators have muted effects on the export performances of the relatively older firms. The empirical results of the study also show that the persistence of exporting behavior has a significantly positive effect on the firms' real exports. He shows that permanent exporters export more, on average, than the temporary exporters. More specifically, he finds that for the whole sample switching from temporary exporting to permanent exporting leads a firm's exports to increase by almost 16 percent. Lastly, he emphasizes that the internal dynamics of the manufacturing industry sectors show a highly heterogeneous structure in terms of capital or labor intensity of production, integration to global value chains (GVC), degree of durability of the products. Thus, the correlation between domestic sales and exports is also expected to differ significantly due to the heterogeneous characteristics of the sectors.

Table 2.1.1

Properties of selected studies in the literature for Turkey

Author	Period	Number of Obs.	Method	Explanatory Variables
Akdogan et al. (2021)	2006-2018	213,546	Panel Data Estimation	REER, Global Exports, Labor Intensity, Employment
Gul (2021)	2004-2014	27,567	GMM	Domestic Sales, Relative Price, Leverage, Profitability, Cash Ratios, Age, Size
Karamollaoglu & Yalcin (2019)	2002-2010	28,430	GMM	Sectoral REERs, Industrial Production Indices, Foreign Outputs, VIX, Labor Productivity, Real Sales, Liability Dollarization, Collateral, Leverage, Import Intensity Ratios
Akhan et al. (2018)	2007-2014	121,880	Panel Data Estimation	REER, Productivity, Import Share in Total Trade
Atabek-Demirhan (2015)	1989-2010	28,480	PSM-DID	Size, Productivity, Credit Constraint, Profitability, Liquidity, R&D Expenses, Marketing Expenses

When the already limited number of firm-level studies on Turkey are evaluated, it is seen that the studies generally do not focus on the effects of financial indictors on firms' exports (Table 2.1). The studies that incorporate financial indicators to their models on the other hand, use these indicators as subsidiary variables rather than the main variable that is at the focal point of their analyses. Beside focusing on the

financial indicators, our study also contributes to the literature as it investigates the relationship between the access to financial loans and Turkish firms' export performances for the first time. Comparing to studies in Turkey, our study has a richer data set as we also utilize customs data apart from the balance sheets data. It has also wider sample size and a more up to date analysis period, which encompasses the post-2018 period in which Turkish Lira depreciated considerably in real terms. Furthermore, to our knowledge, there is no study investigating the heterogeneity in the export performances of firms under this number of different sub-groups, created according to firm characteristics.

CHAPTER 3

OVERVIEW OF EXPORTS IN TURKEY (2010-2020)

In this chapter, a brief overview of exports in Turkey between 2010 and 2020 is presented. In that context, taking the manufacturing sector as the focal point, the course and structure of aggregate exports are introduced.

Exports of the Turkish economy increased to a large extent during this period. Excluding the year 2020, when the Covid-19 Pandemic brought global trade to near a standstill, the GDP grew by 62.2 percent in the 2010-2019 period, while total exports increased by 87.9 percent in real terms. In this period the annual real growth rates for the GDP and exports were realized as 5.9 percent and 6.8 percent on average, respectively. Accordingly, exports increased from 114 billion US dollars in 2010 to 181 billion US dollars in 2019, while the exports to GDP ratio increased from 14.6 percent to 23.8 percent in this period (Figure 3.1).

The macro environment in this period was to a great extent supportive for the aggregate exports. Except for the pandemic year, the global demand conditions, as reflected in export-weighted global GDP index[1] has displayed an increasing trend. The real effective exchange rate on the other hand decreased in the same period. The real depreciation of Turkish Lira, which became more pronounced after 2016, had a stimulating effect on exports as the Turkish goods became more competitive in the export market (Figure 3.2).

[1] Eren and Yavuz (2020) construct this index by taking the average of real GDP growth rates of 110 trade partners of Turkey according to their weights in total exports.

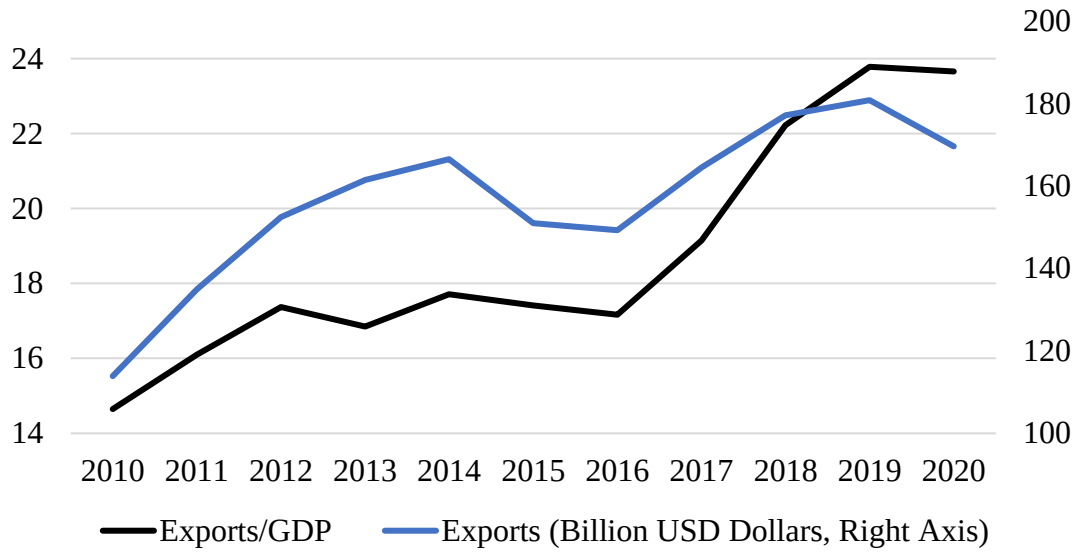


Figure 3.1 Total Exports and the Share of Exports in GDP (%)

Source: TURKSTAT

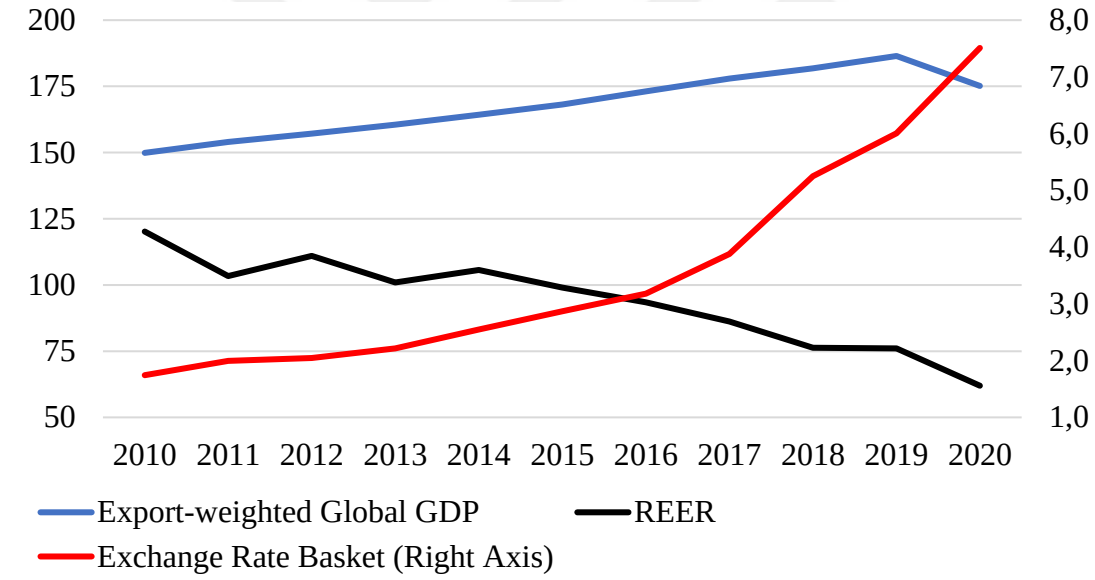


Figure 3.2 Development of Global GDP, REER and Exchange Rate Basket[2]

Source: CBRT

When the source of the change in the value of exports is decomposed into price and quantity effects, it is estimated that the change in quantity has had a greater effect than the change in price of exports (Figure 3.3). In the 2010-2020 period, the export volume

[2] REER is the relative price effects adjusted, weighted average value of the TL relative to the basket of the countries' currencies that have a significant share in Turkey's foreign trade. Exchange rate basket is calculated as the sum of 0.5*TL/US Dollar and 0.5*TL/Euro.

index increased by 67 percent, while the export price index decreased by 11 percent, resulting in an increase of 49 percent increase in the export value denominated in US dollars (Figure 3.3). It can be interpreted that in the analysis period the exporters managed to exploit the competitiveness gains due to the real depreciation in the Turkish Lira by lowering the dollar denominated prices of their products and increasing the volume of their exports.

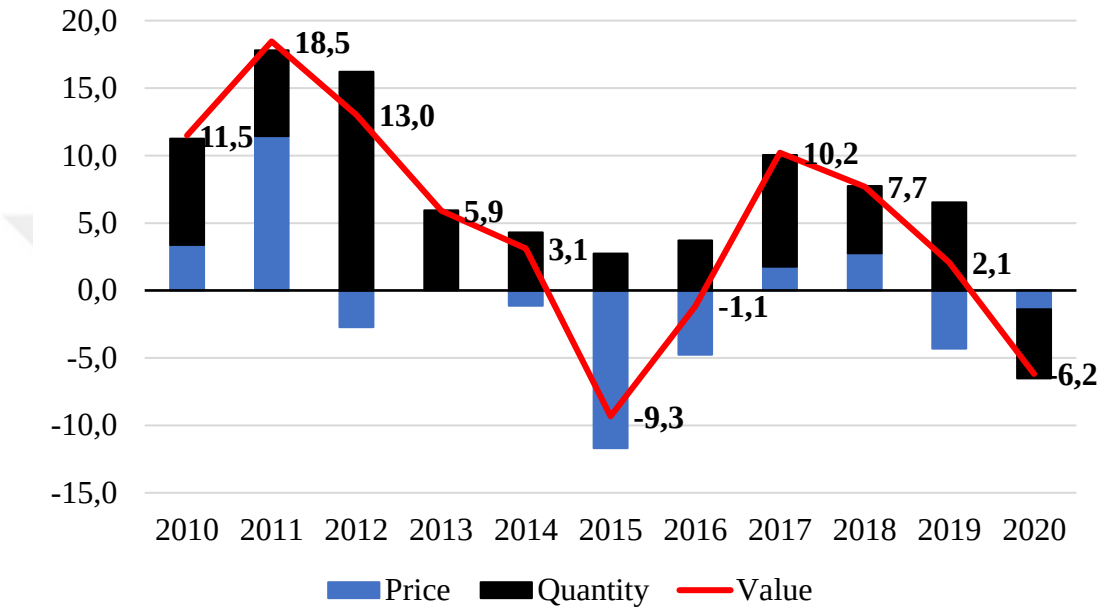


Figure 3.3 Annual Changes in the Export Value, Price and Volume Indices (%)
Source: TURKSTAT, Author's calculations

The competitiveness gains in the Turkish export products were also reflected in the share of Turkish exports in the world exports. In this period the share of Turkish exports increased from 0.74 percent to 0.96 percent, while the share of manufacturing exports, which is expected to be more responsive to exchange rate fluctuations, in world manufacturing exports increased from 0.89 percent to 1.09 percent (Figure 3.4).

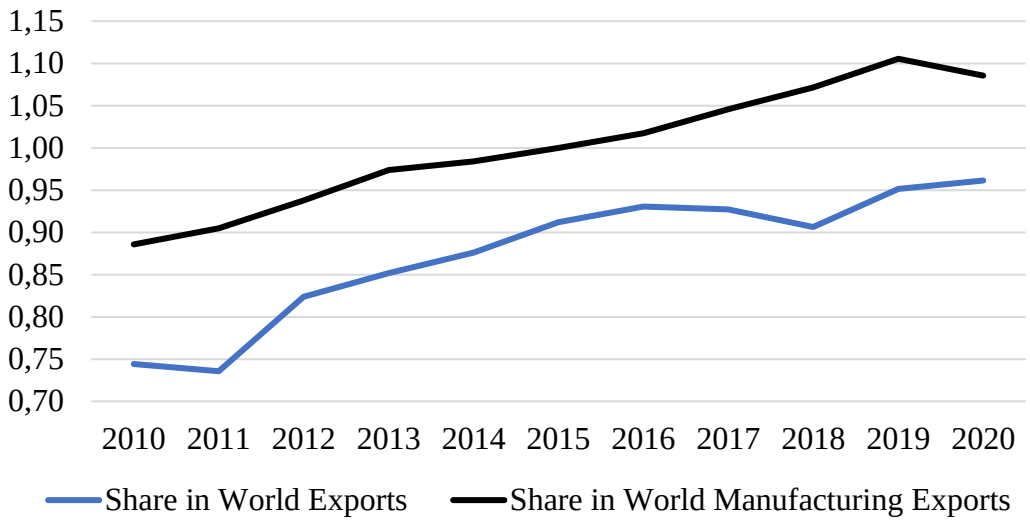


Figure 3.4 Development of the Share of Turkey's Exports in World Exports (%)
Source: WTO

In line with the increased globalization and integration trends to the global trade market, Turkish exports showed a steady improvement in terms of product and market diversification in this period. The numbers of exported products and country-products combinations exhibited increasing trends, as the total number of exported products at HS-6 level increased from 3950 to 4180, while the number of country-product combinations increased from 74,600 to 109,500 (Figure 3.5).

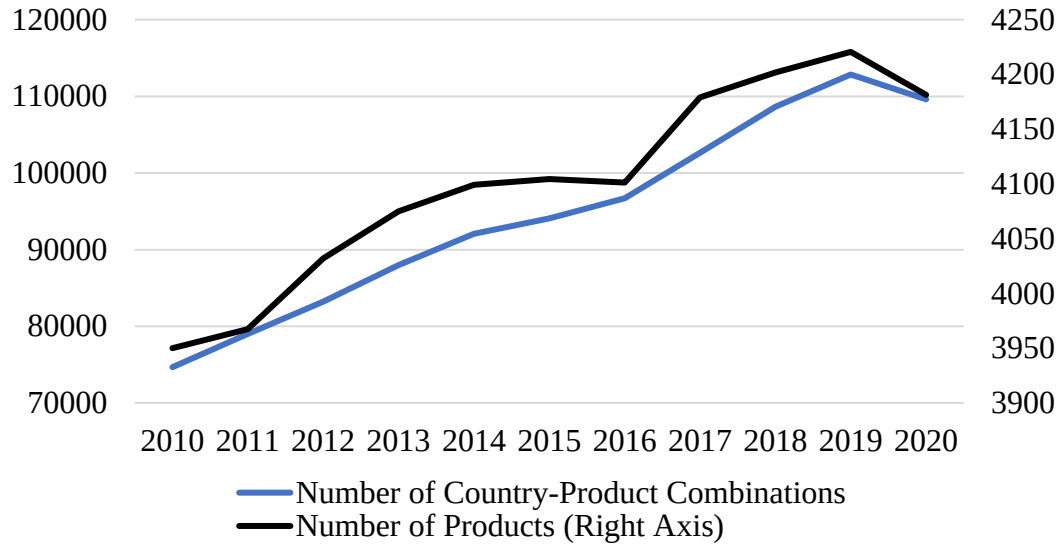


Figure 3.5 Number of Products and Country-Product Combinations
Source: Ministry of Trade

According to 2010-2020 averages, Turkish exporters exported to 226 countries. When the country shares and regional breakdowns are examined, it is noteworthy that with 41 percent of export share, the European Union market was the main export partner for the Turkish economy in the study period. In fact, it is seen that 5 of the top 10 export partners were Germany, United Kingdom, France, Italy and Spain combined of which constitute almost 30 percent of the total exports. With about 28 percent of the total exports, Middle East and Northern Africa (MENA) region, which comprises important export partners such as Iraq, Iran and United Arab Emirates was the second biggest export market for Turkey in the same period. Other European countries and the Commonwealth of Independent States (CIS), which include Russia and Turkic states, were also important export partners with a combined share of 18.5 percent (Table 3.1).

Table 3.1

Top 10 Export Partners of Turkey and Regional Breakdown of Exports[3] (%)

Countries	Share in Total Exports
Germany	9.6
UK	6.4
Iraq	6.3
Italy	5.1
USA	4.6
France	4.3
Spain	3.5
UAE	3.2
Russian Federation	3.0
Iran	2.7

Regions	Share in Total Exports
EU-27	41.0
MENA	27.7
Other Europe	10.2
CIS	8.4
N. America	5.1
Other Africa	2.7
S. America	1.1
Other	3.7

Source: TURKSTAT

[3] According to 2010-2020 average.

The competitiveness gains and improvement in market-product diversification led to increased number of exporting firms by new entrants to the export market. More specifically, between 2010 and 2020 the number of total exporter firms surged from 54 to 92 thousand, while the number of exporter manufacturing firms increased from 18 thousand to 28 thousand. It should be also noted that in line with the depreciation in the Turkish Lira, the annual changes in the number of exporters increased substantially after 2016 (Figure 3.6).

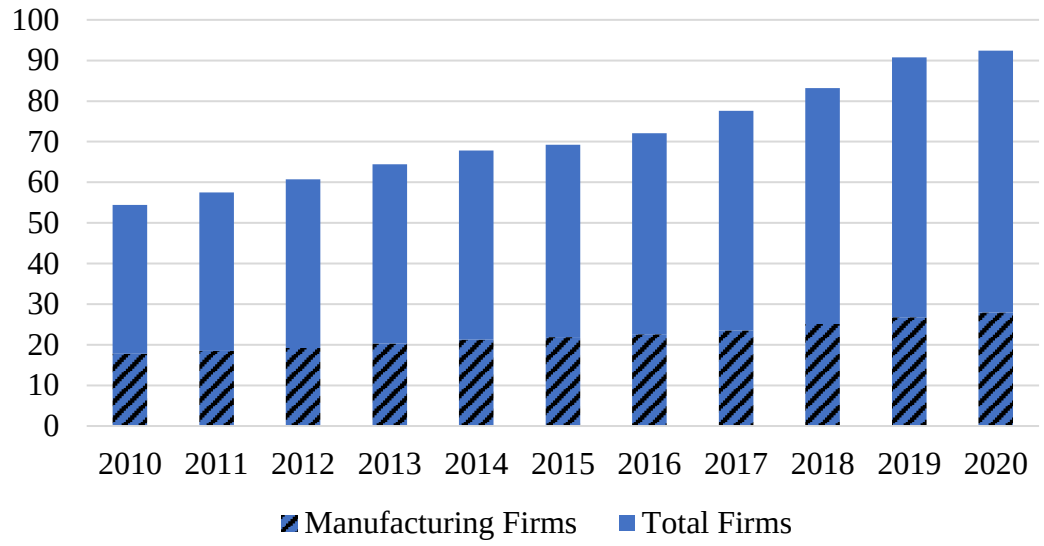


Figure 3.6 Number of Exporting Firms (Thousands)

Source: Ministry of Trade

On a sectoral basis, manufacturing industry exports constitute the vast majority of Turkey's total exports. According to the average of 2013-2020, the ratio of Turkey's manufactured product exports to total exports is quite high at 94%. While the rankings of the exporting sectors in manufacturing remained fairly stable, the motor vehicles sector stands out as the flagship of exports with about 15 percent of total exports. Basic metals, wearing apparel, food products and textiles sectors are the other main Turkish exporter sectors, with shares higher than 7 percent. In this period, the top 10 manufacturing sectors constituted three-quarters of total exports (Table 3.2).

Table 3.2

Sectoral Breakdown of Total Exports and Top 10 Manufacturing Exports[4] (%)

	Share in Total Exports
Agriculture, Forestry and Fishing	3.4
Mining and Quarrying	2.0
Manufacturing	94.2
Motor Vehicles	14.6
Basic Metals	10.7
Wearing Apparel	9.7
Food Products	7.7
Textiles	7.1
Electrical Equipment	6.4
Machinery and Equipment	5.5
Chemicals and Chemical Products	4.8
Fabricated Metal Products	4.8
Rubber and Plastics Products	4.5

Source: TURKSTAT

Regarding the technology intensity of the manufacturing exports, most of the exports consisted of products with mid-high or lower technology, while high technology products comprised quite a low share of the total exports (with only 3.6 percent on average) in the examined period. It is noteworthy that in 2010 the shares for low, mid-low and mid-high were very close to each other at about 32 percent. However, in the analysis period the share of mid-high technology products displayed an upward trend and reached to around 35 percent, reflecting the increased shares of sectors such as motor vehicles, chemical products and machinery and equipment. The share of low technology products including food and textiles products remained relatively stable at

[4] According to 2013-2020 average and ISIC classification.

around one third of the total exports, while the share of mid-low technology products comprising basic metals and coke and refined petroleum products decreased to around 27 percent in 2020 (Figure 3.7).

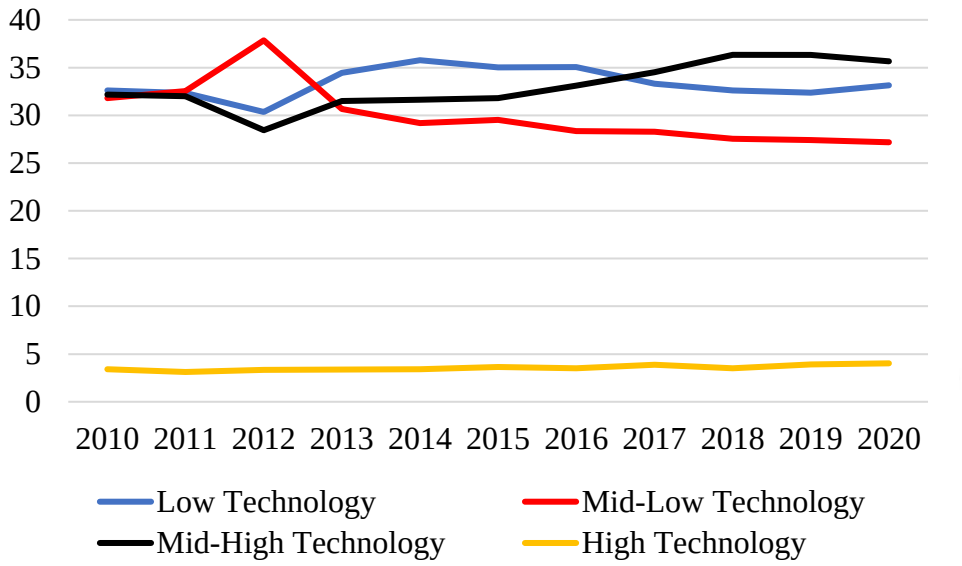


Figure 3.7 Technology Intensity Breakdown of Manufacturing Exports (%)
Source: Ministry of Trade

To better comprehend the implications of exchange rate fluctuations on aggregate exports, it is crucial to consider the exporters' use of imported inputs. A greater import intensity ratio may restrict the competitiveness gains of a depreciation in the Turkish lira for exporters via the cost of production channel. Although this ratio may vary across sub-sectors and firms, following the methodology proposed by Akgunduz and Fendoglu (2019), the estimated averages for the manufacturing industry reveal that this ratio remained fairly stable in the analysis period[5]. Accordingly, it is estimated that on average 28.6 percent of the inputs used by the exporters in the manufacturing sector consisted of imported inputs in the 2010-2020 period (Figure 3.8).

[5] The imported input share is calculated as the ratio of the imports made by a firm to the total purchases made by this firm from domestic and/or foreign firms.

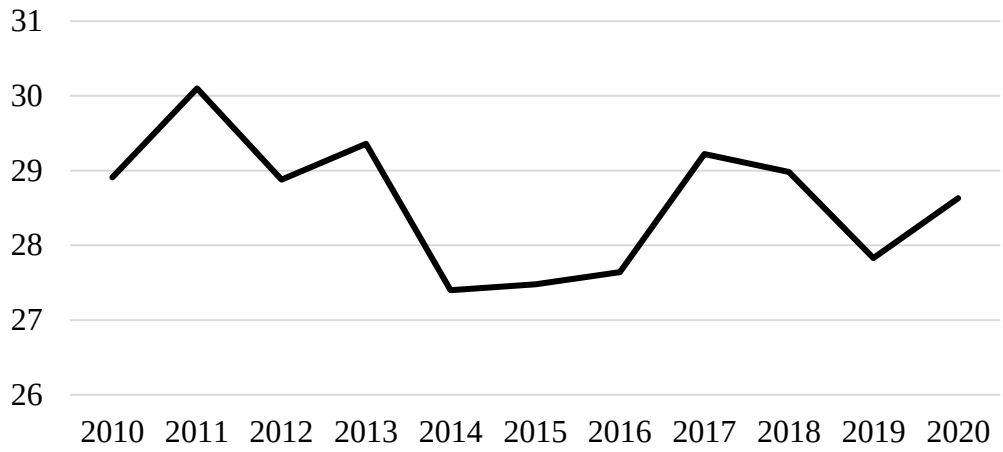


Figure 3.8 Imported Input Share of Exporting Firms in the Manufacturing Industry (%)

Source: Ministry of Trade, CBRT

Lastly, as it is discussed in the literature review section, the presence of foreign direct investments (FDIs) or foreign ownership of firms may have significant stimulating effects on the export performances. In this regard, it should be noted that the ratio of FDIs to GDP followed a volatile course in the analysis period. While it was well below the 2006 peak of 3.6 percent, the FDI ratio reached its highest point in the analysis period in 2015 at around 2.2 percent and declined considerably to 1.1 percent in 2020 (Figure 3.9).

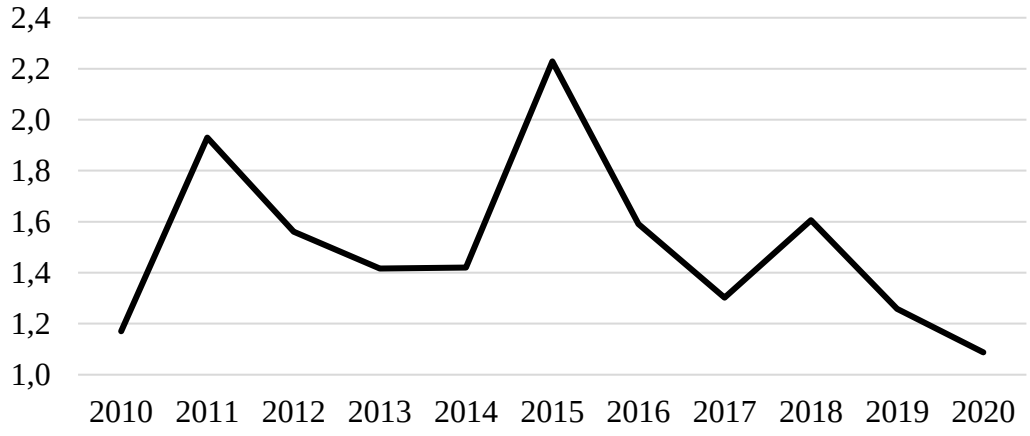


Figure 3.9 Foreign Direct Investment, Net Inflows (% of GDP)

Source: World Bank

CHAPTER 4

DATA AND METHODOLOGY

In this chapter, data and methodology used in this paper are presented in the following two parts. In the first part, variables used to analyze firm-level exports in Turkey for the study period (2010-2020) are explained. In the second part, the methodology and the model used in this study is introduced.

4.1. Data

The microeconomic data used in this paper is at the firm-level referring to the Turkish economy for the period 2010-2020. We utilize two main administrative databases that are made available to the CBRT by the relevant government bodies. These are namely, the Turkish Revenue Administration and Ministry of Commerce. The first database which consists of annual balance sheets and income statements of Turkish non-financial firms prepared according to Tax Procedure Law of Turkey is compiled by the CBRT. Other than balance sheet items, this confidential data set also provides firm-level information on the number of employees, scales, legal status, establishment dates, share of foreign ownership and economic activity areas (classified according to NACE Rev.2 specification). The latter data set supplements the monthly firm-level customs data providing information on the quantity and value of trade flows for each product and with each firm's trading partner. It should be noted that this data set does not include data for public firms and energy exporting firms. Before merging the customs data with the balance sheet data, we aggregate the export values at the firm and annual levels, then deflated these values by the 2-digit sector-specific export price indices in order to create annual real export values for each firm in the sample.

In order to analyze the firm-level dynamics of export performances, we use various macro-level and firm-level variables in our model (Table 4.1.1). As for the macro-level variables, we use export-weighted foreign GDP growth index, calculated as the average of real GDP growth rates of 110 trade partners of Turkey according to their weights in total exports (Eren and Yavuz, 2020) as a proxy for the foreign demand. At the macro-level we also use consumer price index based real effective exchange rate retrieved from the Electronic Data Delivery System (EVDS) of the Central Bank of the Republic of Turkey. An increase in REER implies appreciation of TL against the basket of foreign currencies conditional on relative price indices.

Lastly, as the focus of this study is to analyze the importance of state financial health of firms on their export performance, we incorporate various firm-specific financial indicators driven from the balance sheets data into our model. These 5 variables are namely, the leverage ratio, liquidity ratio, returns on assets ratio, returns on equity ratio and bank ratio. The leverage ratio is defined as the ratio of firm's short-term debt to current assets. The liquidity ratio or Financial Independency Index as Forlani (2010) defines it, is calculated as the firm's total internal resources (sum of equity and cash flows) divided by the total assets. The third and the fourth variables are used as profitability indicators for firms which are the returns on assets (ROA) and returns on equity (ROE) ratios. These are defined as the ratio of the profit (loss) for the period to the total assets and total equity, respectively. All these variables are used in the literature to reveal the degree of the firms' financial health. That is, the higher its liquidity and profitability ratios and the lower its leverage ratio, the better the firm's financial health. The bank ratio on the other hand, is the ratio of bank loans to total liabilities and indicates the level of firm-level dependence to the commercial loans. Lastly, we use number of employees (labor) to control for firms' size (Table 4.1.1).

The firm-level data used in our analysis encompasses the period from 2010 to 2020 and excludes public sector. Due to the fact that majority of the Turkey's export is provided by the manufacturing sector, in this study only the manufacturing sector is considered. We restricted our sample to the manufacturing firms with at least one registered employee and to the period in which both the balance sheet and customs data is available. In this 11-years period, our sample has 1,274,426 firm-year

observations, 254,752 of which have a positive export value. It includes about 23,159 firms each year on average and following the common practice, we excluded firms that had missing or inconsistent values and winsorized the data at 0.1% for each firm-level variable in order to minimize the outliers. The end result is an unbalanced panel data with 245,089 firm year observations.

Table 4.1.1

Variable Names, Definition and Data Source

Abbreviation	Definition	Source
EXP	Total Value of Exports Deflated by Export Price Index	Ministry of Commerce TURKSTAT
FGDP	Export-weighted Foreign GDP Growth Index	CBRT
REER	Consumer Price Index based Real Effective Exchange Rate	CBRT
LEV	Firm's ratio of short-term debt to current assets	Turkish Revenue Administration
LIQ	Firm's total internal resources (sum of equity and cash flows) divided by the total assets	Turkish Revenue Administration
ROA	The ratio of the profit (loss) for the period to the total assets	Turkish Revenue Administration
ROE	The ratio of the profit (loss) for the period to the total equity	Turkish Revenue Administration
BANK	The ratio of bank loans to total liabilities	Turkish Revenue Administration
LABOR	The number of Employees	Turkish Revenue Administration

It is a well-diversified set in terms of firm size, as of the firms included in the sample, 20% are micro-sized firms, 44.5% are small firms, 25.1% are medium firms and 10.3%

are large firms on average. The size classification is made on the basis of small and medium sized enterprises (SMEs) definition of Ministry of Industry and Technology. Accordingly, the firms are classified with respect to employment and net sales (or total assets) criteria.[6] When the total export is analyzed on the basis of firm scale, it is seen that the export shares of micro, small, medium and large firms on average are 1%, 6.5%, 15.5% and 77% respectively (Table 4.1.2).

For the purpose of analyzing firm heterogeneity across different firm groups, we also classify the firms using criteria other than the size. Firstly, we classify them according to their status of being a permanent exporter or not. Accordingly, a firm is defined as a permanent exporter if it has a positive export value for at least 9 out of 11-year time period. Other firms are defined as temporary exporters. It is not surprising that the larger the firms get, the more consistently they export. In that sense, we observe that only 9 percent of the micro sized firms are permanent exporters, while this share increases to 19.5 percent with the small firms, 35 percent with the medium sized firms and 55 percent with the large firms. In addition, small and medium sized firms (SMEs) make up about 71 percent of the total permanent exporters, while the large firms' share is about 16 percent (Table 4.1.2).

Secondly, firms are classified according to their ages or establishment dates in order to investigate the effect of the business experience on the export performances. Accordingly, the year 2001 is taken as a threshold year for the reason that not only Turkish economy experienced a deep economic crisis in that year but also many structural changes took place after the same year. As it is expected, the average age or experience increases with the firm size. It is seen that only about 20 percent of the micro sized firms appear to be founded before 2001, while 31, 45 and 60 percent of small, medium and large sized firms were founded before that year, respectively.

Thirdly, firms are investigated according to their technological intensity. To this aim, we follow Eurostat's aggregation of the manufacturing industry according to technological intensity and based on NACE Rev.2. for compiling aggregates related to high-technology, medium high-technology, medium low-technology and low-

[6] For more details, see Appendix.

technology. However, as the number of high-tech firms are significantly lower compared to other technology groups, the high and mid-high technology groups are combined to form a single high & mid-high group. Accordingly, the firms are classified under one of those three technology groups in line with the sectors they operate in. This classification reveals that 36 percent of the firms analyzed are engaged in low technology production, while 31 and 33 percent of the firms are classified under mid-low and mid-high & high technology groups.

Table 4.1.2

Descriptive Statistics

	Micro	**Small**	**Medium**	**Large**
Observations (11 Years)	49,322	109,126	61,495	25,147
Number of Firms	22,697	32,102	15,666	4,761
Share in Total Exports (%)	1.0	6.5	15.5	77.0
Number of Permanent Exporters	2063	6296	5490	2616
Share in Permanent Exporters (%)	12.5	38.2	33.3	16.0
Number of Firms with Foreign Share	853	1127	924	695
Share in Firms with Foreign Share (%)	23.7	31.3	25.7	19.3
Average Number of Employees	3.9	20.2	80.7	501
Average Age of Firms	9	14	19	27

Lastly, firm-level exports are investigated taking the degree of firms' integration to the global value chains (GVC) into account. To this aim, we investigate two separate indicators which are used in the literature as proxies for the degree of integration. Firstly, the firms are investigated according to their degree of import dependency. To this aim, we follow a common practice and define firm-level ratios calculated by the value of imported intermediate goods divided by cost of sales. That is, if a firm has a ratio higher than the median value, then this firm is classified as high import-

dependent. If the import intensity ratio is lower than this threshold on the other hand, then this firm is classified as low import-dependent. Secondly, we follow the studies such as Amador et. al. (2021) and use foreign ownership ratios as a proxy for the degree of integration to the GVC. Accordingly, we utilize the CBRT Company Accounts Data and classify the firms as (partly) foreign-owned if the foreign ownership ratio is higher than zero and the other firms as not-foreign-owned. This criterion reveals that about 3.5 percent of micro and small sized firms have shares owned by foreign investors, while 6 percent of medium sized firms and 15 percent of large firms are foreign-owned.

Table 4.1.3

Descriptive Statistics

	Log-EXP	Log-REER	Log-FGDP	Log-LABOR	LEV	ROA	ROE	LIQ	BANK
Mean	**7.31**	**4.50**	**5.13**	**3.13**	**0.76**	**0.04**	**0.15**	**0.13**	**0.09**
Median	**7.33**	**0.19**	**5.15**	**23**	**0.74**	**0.03**	**0.10**	**0.07**	**0.02**
Maximum	**17.94**	**4,79**	**5.23**	**9.79**	**2.88**	**0.46**	**2.69**	**0.76**	**0.62**
Minimum	**-9.43**	**4.12**	**5.01**	**0.0**	**0.03**	**-0.47**	**-2.47**	**-0.25**	**0.0**
Std. Dev.	**2.48**	**0.19**	**0.07**	**1.55**	**0.46**	**0.12**	**0.52**	**0.17**	**0.14**
Skewness	**-0.15**	**-0.53**	**-0.26**	**0.13**	**1.59**	**-0.31**	**-0.09**	**1.41**	**1.78**
Kurtosis	**3.50**	**2.29**	**1.89**	**3.02**	**7.99**	**8.84**	**15.94**	**5.50**	**5.77**
Obs.	**245086**	**245086**	**245086**	**245086**	**245086**	**245086**	**245086**	**245086**	**245086**

As it is stated in Table 4.1.3, the variables are in a narrow band around their mean with small standard deviations. LogEXP, logREER, logFGDP, ROA and ROE have negative skewness meaning that they have long left tail, while logLABOR, LEV, LIQ and BANK have positive skewness and long right tail. It is shown that all variables except for logREER and logFGDP, have kurtosis higher than 3 so that they are distributed peaked while other two series are distributed flat relative to the normal

(Table 4.1.3). Furthermore, if the correlation matrix is examined it is seen that except for the correlation between logFGDP and logREER, the correlations are fairly low, which limits the probability of multicollinearity problem in our empirical analysis, although the large panel data itself alleviates the problem of linear correlation between the explanatory variables as well (Table 4.1.4).

Table 4.1.4

Correlations

	Log-EXP	Log-REER	Log-FGDP	Log-LABOR	LEV	ROA	ROE	LIQ	BANK
LogEXP	**1.00**								
LogREER	**0.01**	**1.00**							
LogFGDP	**-0.01**	**-0.80**	**1.00**						
LogLABOR	**0.45**	**0.06**	**-0.05**	**1.00**					
LEV	**-0.09**	**0.01**	**0.01**	**-0.06**	**1.00**				
ROA	**0.10**	**-0.07**	**0.05**	**0.02**	**-0.36**	**1.00**			
ROE	**0.01**	**-0.05**	**0.04**	**-0.06**	**0.05**	**0.24**	**1.00**		
LIQ	**-0.01**	**-0.05**	**0.02**	**-0.06**	**-0.26**	**0.21**	**0.06**	**1.00**	
BANK	**0.14**	**0.09**	**-0.08**	**0.21**	**0.20**	**-0.15**	**-0.06**	**-0.07**	**1.00**

When the course of macro variables in the analysis period is examined, it is seen that export-weighted foreign GDP exhibited a steady upward trend until 2020, when the global economy hit by the Covid-19 pandemic shock. The real effective exchange rate on the contrary have displayed a downward trend in the same period, while the real depreciation of Turkish Lira became more evident after 2016 (Figure 4.1.1). Accordingly, it is expected that the macro developments in the analysis period should have supported the export environment in Turkey.

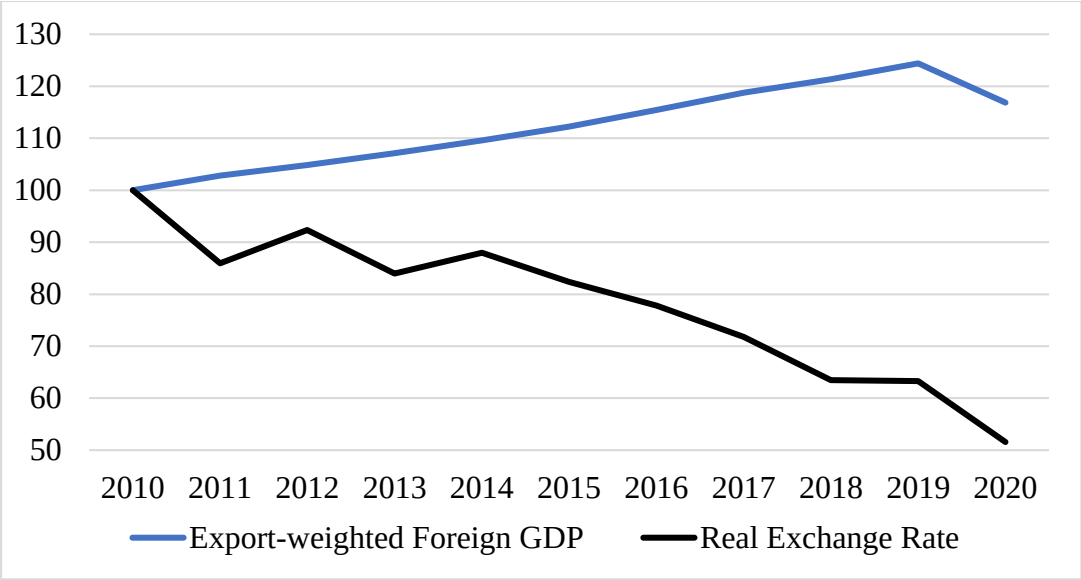


Figure 4.1.1 Development of Foreign GDP and Real Exchange Rate (2010=100)

Source: CBRT

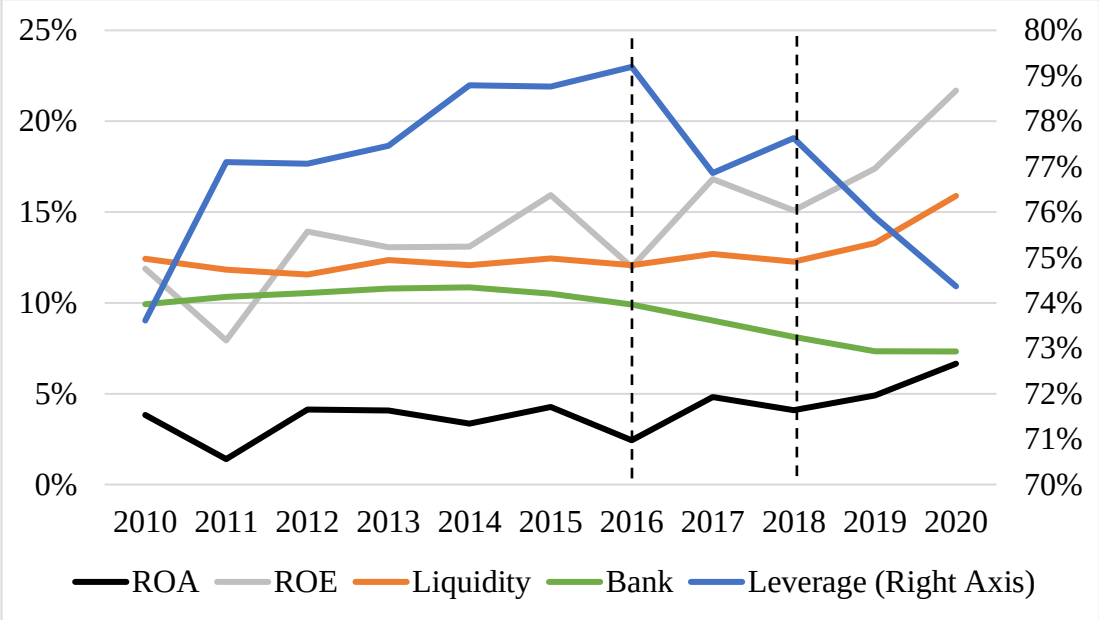


Figure 4.1.2 Development of Financial Indicators (2010-2020)

Source: Revenue Administration

On the firm specific variables side, it is seen that financial indicators of exporter firms have improved since 2016 in line with the real deprecation of the Turkish Lira (Figure 4.1.2). It is noteworthy that this improvement trend became more evident after 2018. Accordingly, in this period profitability (ROA and ROE) and liquidity ratios have increased, while the leverage (indebtedness) ratio has decreased, showing an

improvement in the balance sheets of the exporters. Moreover, the ratio of bank loans to total assets have had a downward trend in the same period, as the need for bank loans might have decreased in line with the improvement in the liquidity and profitability conditions of the exporter firms.

4.2. Methodology

Models aiming to analyze the export dynamics of firms are generally estimated using panel data methods. Panel datasets include both time-independent cross-section variability and cross-section-independent variability over time. Panel data set has some advantages over cross section and time series data sets. According to Hsiao (2003) first of these is the increase in the number of observations in the panel data, and therefore the degree of freedom. Increasing the degree of freedom alleviates the problem of linear correlation between the explanatory variables. Secondly, increasing the number of observations both across cross-section and time makes the panel data more effective against the endogeneity problem caused by measurement errors. In addition to measurement errors, the omitted variable problem arising from the variables that should be present in the model but not included, violates the assumption that the error term and the explanatory variables should be independent from each other. Hsiao (2003) argues that panel data, which considers intertemporal dynamics and cross-sectional variability, is also more effective for controlling for omitted variable deviation. Another advantage of the panel data set over the time series is about the stationarity assumption. In time series analysis, the properties of the series such as mean and variance should be stationary over time. Otherwise, the long-term relationships obtained from the established models could be misleading. Hsiao (2003) states that when working with panel data, observations along horizontal sections will be independent of each other, so that in large samples estimators with normal distribution can be obtained by using the central limit theorem.
Panel data models are generally expressed as:

$$y_{it} = \boldsymbol{\lambda} + \beta x_{it} + \varepsilon_{it} \qquad i=1, 2,\ldots,N \qquad t=1,2,\ldots,T \qquad \textbf{(1)}$$

where *i* is the individual dimension and *t* is the time dimension. β stands for 1xK coefficient vector, whereas x_{it} is Kx1 explanatory variables matrix. ε_{it} represents the error term.

$$\varepsilon_{it} = \mu_i + v_{it} \quad \textbf{(2)}$$

where ε_{it} consists of two components, namely μ_i are individual-specific, time-invariant effects which are fixed over time, whereas v_{it} is a time-varying random component. If μ_i is unobserved, and correlated with at least one of the independent variables, then it will cause omitted variable bias in a standard OLS regression. However, panel data methods, such as the fixed effects estimator can be used to control for it.

Panel data sets are divided into two according to criterion of whether the observations are missing or not. If for every time unit *t* the data set has an observation about the panel unit *i*, this panel data set is called a balanced panel. If the observations for the panel units *i* for time units *t* are missing on the other hand, this panel data set is called an unbalanced panel. At this point, the reason behind the missing observations is important. Wooldridge (2002) emphasizes that if the reason for missing observations is systematic with the dependent variable, sample selection problems could be encountered. That is, if the analyzed data set has an unbalanced form, then the absence of observations in the data set should be random.

In this study, export models are mainly handled with static panel data models. These models are divided into two as fixed effects (FE) and random effects (RE) models. The main distinction between fixed and random effects models is whether the cross-sectional effects are a variable to be estimated within the model.

Fixed effects model is generally expressed as:

$$y_{it} = \alpha_i + \beta x_{it} + \varepsilon_{it} \quad i=1, 2,\ldots,N \quad t=1,2,\ldots,T \quad \textbf{(3)}$$

where α_i represent random individual-specific effects. In the FE model, the α_i in (3) are permitted to be correlated with the regressors x_{it}. This allows a limited form of endogeneity (Cameron & Triverdi, 2010). However, if the panel-specific time-fixed effects are random, the predictions made by the fixed-effects model might be inconsistent. The random effects model assumes that these individual effects are random and not related to the explanatory variables in the model. Which of the assumptions about time-fixed individual effects is valid or which model's predictions should be preferred is determined by the test developed by Hausman (1978). This test, whose null hypothesis is that the random effects model is more appropriate, is based on the difference between the fixed and random effects estimators.

In this study, following the literature we construct a standard export model, in which firm-level exports are explained by foreign demand and real exchange rate, along with various firm-specific financial indicators. Then by using Hausman test, we test for the validity of fixed effects to control for the possible fixed effects in the panel data. Moreover, as the test results indicate the existence of Heteroscedasticity (HC) and Autocorrelation (AC), following the studies such as Hoechle (2007) we use HC and AC robust standard errors in the estimation of export models[7]. As for the cross-sectional dependence, Baltagi et. al (2016) assert that cross-sectional dependence is a problem in macro panels with long time series and is not much of a problem in micro panels with few years and large number of observations. Accordingly, since our panel data set has an extensive cross-sectional part and fairly short time-series component, we do not test for the existence of cross-sectional dependency and the individual unit roots for the variables.

The base model we use in this study to quantify the impact of firm-specific financial indicators is as follows:

$$\mathrm{LogEXP_{ijt}} = \beta_0 + \beta_1 \mathrm{LogFGDP_t} + \beta_2 \mathrm{LogREER_t} + \beta_3 \mathrm{LogLABOR_{it}} + \beta_4 \mathrm{LEV}_{it} + \beta_5 \mathrm{ROA}_{it} + \beta_6 \mathrm{ROE}_{it} + \beta_7 \mathrm{LIQ}_{it} + \beta_8 \mathrm{BANK}_{it} + \varepsilon_{it} \quad \textbf{(4)}$$

[7] See Appendix for the test results.

where i indexes firms, t shows time (years), j is the industry to which firm i belongs, LogExp_{ijt} is firm-level real exports, LogFGDP stands for the log of export-weighted foreign GDP, LogREER_t is log of export-weighted real exchange rates (a rise in this index represents a real appreciation of the domestic currency), LogLABOR_{it} is log of number of employees and controls for firm size; LEV_{it}, ROA_{it}, ROE_{it}, LIQ_{it}, BANK_{it} stand for leverage, return on assets, return on equity, liquidity and bank loans ratios respectively. Lastly, ε_{it} represents the error term of the model.

In order to decide between fixed and random effects models, we apply Hausman test and conclude that fixed effects model should be utilized in our base model.

Table 4.2.1

Hausman Test Results

	Coefficients			
VARIABLES	(b) Fixed	(B) Random	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
LogREER	-0.479	-0.433	-0.045	0.007
LogFGDP	0.332	0.276	0.056	0.017
LogLABOR	0.589	0.594	-0.005	0.005
LEV	-0.066	-0.121	0.055	0.005
ROA	1.422	1.435	-0.013	0.011
ROE	0.041	0.052	-0.011	0.002
LIQ	0.048	-0.001	0.048	0.011
BANK	0.300	0.458	-0.158	0.014

b= consistent under Ho and Ha; obtained from xtreg
B= inconsistent under Ha, efficient under Ho; obtained from xtreg
Test: Ho: difference in coefficients not systematic-*
chi2(8) = (b-B)́ [(V_b-V_B)^(-1)](b-B)
= 355.65
Prob>chi2 = 0.000

Additionally, we incorporate year fixed effects θ_t in order to absorb any year specific shocks that are common across all product categories that might impact the export performances:

$$\text{LogEXP}_{it} = \beta_0 + \beta_1 \text{LogFGDP}_t + \beta_2 \text{LogREER}_t + \beta_3 \text{LogLABOR}_{it} + \beta_4 \text{LEV}_{it} + \beta_5 \text{ROA}_{it} + \beta_6 \text{ROE}_{it} + \beta_7 \text{LIQ}_{it} + \beta_8 \text{BANK}_{it} + \theta_t + \varepsilon_{it} \quad \textbf{(5)}$$

Based on the literature, it is expected that increase in foreign demand and real depreciation of domestic currency have a positive effect on exports and hence β_1 is expected to have a positive value whereas β_2 is expected to have a negative value. Similarly, a relatively better financial health is expected to yield positive effect on export performance and hence $\beta_5, \beta_6, \beta_7$ may be expected to have positive values, whereas β_4 may have a negative value according to the theoretical framework. On the other hand, there is not a particular expectation regarding the effect of bank loans on export performance, even though it might be expected to be positive the significance and direction of β_8 may vary across different firm groups.

CHAPTER 5

EMPRICAL RESULTS

In this chapter, empirical results of the baseline econometric model for the whole sample are examined. Additionally, the base model is utilized for examining the heterogeneous effects of macro and firm-specific variables across different classifications and estimation results of these are presented. These classifications are namely, size, permanence in exporting, age (experience), technology intensity of production, the degree of imported input intensity and the level of foreign ownership, respectively. For the econometric analysis of all the empirical models Stata 15 software is used.

5.1 Results of the Base Model

Table 5.1.1 presents the results of the base model (5) for the full sample along with the sub-groups created according to firm scales. Since the share of micro-scaled firms in the total exports is very limited at about 1 percent and the probability of encountering misleading firm-level data is relatively higher among those firms, the micro-scaled firms will be excluded from the analysis throughout this study.[8]

Empirical results show that coefficients of the macro and micro-level variables in the base model are all found to be significant. In line with the economic theory, coefficient of the real exchange rate is found to be negative, which implies that a real depreciation in Turkish Lira will increase exports. The coefficient of foreign GDP is found to be positive, indicating that an increase in the foreign demand will increase exports as well. For the full sample (including small, medium and large scaled firms) results show that a 10 percent decrease in real exchange rate increases exports by about 2 percent. A 10 percent increase in foreign demand on the other hand increases exports by 12 percent (Table 5.1.1).

[8] See Appendix for the model results of whole sample including the micro-scaled firms.

Table 5.1.1

Results of the Base Model

	(1) Full Sample	(2) Small	(3) Medium	(4) SMEs	(5) Large
LogREER	-0.198***	-0.102**	-0.203***	-0.172***	-0.354***
	(0.037)	(0.048)	(0.069)	(0.039)	(0.114)
LogFGDP	1.202***	1.696***	1.226***	1.381***	0.606*
	(0.111)	(0.142)	(0.205)	(0.117)	(0.343)
LogLABOR	0.569***	0.505***	0.470***	0.552***	0.470***
	(0.009)	(0.013)	(0.021)	(0.010)	(0.034)
LEV	-0.086***	-0.056***	-0.043	-0.063***	-0.190***
	(0.013)	(0.017)	(0.027)	(0.014)	(0.046)
ROA	1.140***	1.207***	1.032***	1.184***	0.688***
	(0.043)	(0.054)	(0.085)	(0.045)	(0.148)
ROE	0.036***	0.057***	0.009	0.046***	-0.038
	(0.008)	(0.010)	(0.014)	(0.008)	(0.023)
LIQ	0.063**	0.076**	0.040	0.080**	-0.046
	(0.032)	(0.039)	(0.063)	(0.033)	(0.120)
BANK	0.326***	0.133**	0.318***	0.256***	0.604***
	(0.038)	(0.053)	(0.070)	(0.041)	(0.112)
Constant	0.454	-2.733***	0.956	-0.715	6.006***
	(0.704)	(0.898)	(1.295)	(0.741)	(2.174)
Observations	195,408	108,817	61,451	170,268	25,140
R-squared	0.086	0.045	0.035	0.051	0.036
# of firms	42,385	32,008	15,651	40,261	4,759
R2	0.158	0.00436	0.0152	0.0613	0.0493

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.10

On the firm-level variables side, improvement in financial health is found to be affecting exports positively in line with the literature. More specifically, increase in liquidity, returns on assets (ROA) and returns on equity (ROE) ratios are found to increase the exports of all firms, while an increase in leverage ratio effects firms' exports negatively. Results show that 10 percentage points increase in ROA, ROE and liquidity ratios would increase firm exports by 11, 0.4 and 0.6 percent respectively, indicating that ROA has the highest impact on the firms' export performances among the financial indicators. The ratio of bank loans to total liabilities is also found to be affecting firm exports positively; a 10 percentage points increase in bank ratio would

increase firm exports by 3.3 percent. This result implies that the access to bank loans supports the exporting activities of the manufacturing firms. Lastly, the number of employees is found to increase exports; a 10 percent increase will increase exports by 5.7 percent on average.

When the base model is utilized for different scale groups, it is noteworthy that the impact of the explanatory variables might differ according to firm scales. For the macro variables, results show that the impact of a real depreciation of Turkish Lira gets larger while the effect of foreign demand on exports diminishes as the firm scale increases. At the firm-level on the other hand, it is found that the effect of number of employees on firm exports do not vary considerably across different scale groups, while its effect is slightly more pronounced for the small firms as they generally consist of more labor-intensive firms. However, it is notable that as the firm scale increases, the impact of profitability and liquidity ratios on firm exports become less evident, even gets insignificant, while the bank ratio becomes more effective. It is seen that a 10 percentage points increase in bank ratio would increase exports of large firms by 6 percent, while this number is only 1 and 3 percent for the small and medium scale firms, respectively. This finding is in line with the literature, as the larger firms have more access to commercial credits, which they might use financing their production and exporting activities.

5.2 Heterogeneous Effects of Permanence in Exporting

When the exporter firms are divided into two groups according to their status of being a permanent exporter or not, it is seen that there is a heterogeneity across these groups in terms of the effect of real exchange rate and foreign demand. It is noteworthy that real exchange rate changes do not have a significant effect on permanent exporter firms' exports, while it does on the temporary exporters. The changes in the foreign demand on the other hand is found to be effective only for the permanent exporters. This heterogeneity might arise due to some firms' motivation to exploit the real depreciation of Turkish Lira and decide to export when exporting becomes more profitable than producing for the domestic market. That is, the temporary exporters depend on the competitive advantage generated by the real depreciation of the

domestic currency. When the domestic currency depreciates in real terms, their products become competitive enough in the global markets, and hence they increase their exports significantly. However, these firms do not necessarily respond to changes in the foreign demand. There are also some firms that have been exporting regardless of the course of the exchange rate. These permanent exporters are structurally competitive enough to penetrate the export market and increase their exports if there is an increase in the foreign demand. The estimation results indicate that permanent exporters increase their exports by 20 percent if there is a 10 percent increase in foreign demand, while the not-permanent exporters increase their exports by 3.7 percent in case of a 10 percent real depreciation in Turkish Lira (Table 5.2.1).

Table 5.2.1

Results according to being a Permanent Exporter

	(1) Permanent	(2) Temporary
LogREER	0.068	-0.368***
	(0.047)	(0.060)
LogFGDP	2.039***	0.025
	(0.140)	(0.180)
LogLABOR	0.646***	0.457***
	(0.011)	(0.014)
LEV	-0.069***	-0.082***
	(0.016)	(0.022)
ROA	1.130***	1.143***
	(0.054)	(0.069)
ROE	0.024*	0.049***
	(0.010)	(0.011)
LIQ	0.075**	0.079
	(0.038)	(0.053)
BANK	0.285***	0.342***
	(0.045)	(0.066)
Constant	-4.800***	7.131***
	(0.895)	(1.113)
Observations	95,817	99,591
R-squared	0.071	0.046
Number of firms	10,027	32,358
R2	0.234	0.036

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.10

The model results reveal a heterogeneity across the two groups in terms of the effects of firm-level variables as well. The export performances are found to be more dependent on the degree of financial health for the temporary exporters. That is, the increases in profitability ratios of ROA and ROE or the declines in the leverage (indebtedness) ratio boost the firm exports relatively more for the temporary exporters. For the permanent exporters on the other hand, although the signs of the financial indicators are same with those of the temporary exporters, their effects on the firm exports are found to be more limited. Furthermore, it is seen that the exports of the permanent exporters are less dependent on the bank loans, as those firms might not need bank loans to finance their export activities as much as the temporary exporters do. That is, the permanent exporters might utilize their internal resources relatively more and the finding that the liquidity ratio is significant only for the permanent exporters supports this claim.

5.3 Heterogeneous Effects of Experience

Table 5.3.1 presents the estimation results of the base model for the two sub-groups created according to the experiences of the firms. The firms that are established before 2001 is classified as "old" whereas the other firms are defined as "young" firms. Accordingly, it is found that the real exchange rate does not affect the export decisions of the old firms, while it has a significantly positive effect on the exports of young firms. Young firms' export performances are also found to be more responsive to the changes in foreign demand. That is, as the firms get more experienced, they would get more competitive and export regardless of the changes in the real exchange rate. The young firms on the other hand, try to exploit the competitiveness gains due to depreciation in Turkish Lira and increase their exports (Table 5.3.1).

The financial health indicators are found to matter more for the export performances of the young firms. That is, increases in profitability indicators of ROA along with improvements in liquidity conditions are expected to boost the exports more for the young firms. More specifically, 10 percentage points increases in ROA, ROE and liquidity ratios would result in about 13, 0.5 and 0.8 percent increases in young firms'

exports on average. For the experienced firms on the other hand, although the signs of the coefficients are the same, their magnitudes are significantly lower. Furthermore, the ratio of bank loans to the total liabilities is found to be affecting the firms at a similar rate regardless of their experience.

Table 5.3.1

Results according to Experience

	(1) Old	(2) Young
LogREER	-0.011	-0.427***
	(0.055)	(0.052)
LogFGDP	1.128***	1.479***
	(0.164)	(0.153)
LogLABOR	0.622***	0.516***
	(0.014)	(0.012)
LEV	-0.079***	-0.072***
	(0.019)	(0.018)
ROA	0.950***	1.329***
	(0.062)	(0.060)
ROE	0.025**	0.047***
	(0.012)	(0.010)
LIQ	0.066	0.079*
	(0.047)	(0.043)
BANK	0.309***	0.304***
	(0.054)	(0.054)
Constant	-0.168	0.151
	(1.052)	(0.954)
Observations	91,171	104,237
R-squared	0.041	0.063
Number of firms	15,512	26,873
R2	0.230	0.0819

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.10

5.4 Heterogeneous Effects of Technology Intensity

In order to investigate the possible heterogeneity caused by the technological intensity of firms' export products, the baseline model is estimated for the three technology

groups separately. The results indicate that changes in the real exchange rate affect the exports of the firms which operate in the mid-low technology sectors, such as basic metals, fabricated metal products, rubber and plastic products. For the firms in the low-tech sectors such as textiles and food products on the other hand, the course of the Turkish Lira is found to be not effective on the export performances. This might be due to the fact that those sectors have been among the main exporting sectors in Turkey for a long time and the firms operate in those sectors continue exporting regardless of the changes in the exchange rate. For the high and mid-high technology group which comprises sectors such as motor vehicles, machinery and electrical equipment, the real exchange rate is found to have no significant effect as well. It is noteworthy that the exports of the firms operating in that group are more responsive to the changes in the foreign demand, as they probably adjust their exports to meet the foreign demand, especially coming from the Turkey's main export partner, the Euro Area. It is also found that as the technology intensity of the products increase, the firms become more responsive to the changes in foreign demand (Table 5.4.1).

Table 5.4.1

Results according to Technology Intensity

	(1) Low Tech	(2) Mid-Low Tech	(3) High & Mid-High Tech
LogREER	-0.054	-0.419***	-0.061
	(0.060)	(0.068)	(0.068)
LogFGDP	0.839***	1.331***	1.799***
	(0.178)	(0.203)	(0.201)
LogLABOR	0.525***	0.600***	0.646***
	(0.013)	(0.018)	(0.018)
LEV	-0.072***	-0.065***	-0.083***
	(0.022)	(0.023)	(0.024)
ROA	1.133***	1.138***	1.185***
	(0.071)	(0.079)	(0.075)
ROE	0.031***	0.036**	0.015
	(0.012)	(0.014)	(0.014)
LIQ	-0.019	-0.032	0.229***
	(0.049)	(0.060)	(0.056)
BANK	0.323***	0.373***	0.368***
	(0.057)	(0.072)	(0.075)
Constant	1.988*	0.554	-3.656***

Table 5.4.1 (continued)

	(1.127)	(1.288)	(1.269)
Observations	76,487	56,955	61,966
R-squared	0.047	0.065	0.060
Number of firms	20,394	17,768	18,335
R2	0.113	0.202	0.180

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.10

The results also show that improvement in ROA and liquidity ratios support exports of high-tech firms relatively more, as those firms might be more successful directing those resources to increase their exporting capacities. Moreover, although the difference seems not to be considerable, the effect of bank ratio is found to be relatively lower for the low-tech firms, indicating that those firms are facing more problems accessing to finance.

5.5 Effects of the Degree of Integration to Global Commodity Chains

5.5.1 Heterogeneous Effects of Import Intensity

Following a common practice, firms are separated into two groups according to the import intensity ratios which are calculated by the value of imported intermediate goods divided by cost of sales. The firms that have a ratio higher than the median value are classified as high import-dependent, while the others with ratios lower than this threshold are classified as low import-dependent. When the base model is estimated separately for the two groups, the empirical results show that high import intensive firms respond to changes in foreign demand more compared to low import intensive firms. It is not surprising as those firms are expected to be parts of global supply chains to a greater extent, need more imported inputs to export and hence affected relatively more by the course of the global supply conditions. Moreover, as the low import intensive products such as food products are generally less luxurious in nature, the exports of those products are less responsive to the volatilities in the global economy (Table 5.5.1.1).

Table 5.5.1.1

Results according to Import Intensity

	(1) High Import Intensive	(2) Low Import Intensive
LogREER	-0.153***	-0.285***
	(0.043)	(0.046)
LogFGDP	1.276***	0.935***
	(0.128)	(0.136)
LogLABOR	0.606***	0.516***
	(0.011)	(0.011)
LEV	-0.117***	-0.067***
	(0.016)	(0.016)
ROA	1.135***	1.019***
	(0.051)	(0.053)
ROE	0.044***	0.042***
	(0.009)	(0.010)
LIQ	0.030	0.066*
	(0.038)	(0.038)
BANK	0.400***	0.259***
	(0.044)	(0.047)
Constant	-0.482	2.156**
	(0.811)	(0.866)
Observations	141,707	138,153
R-squared	0.054	0.044
Number of firms	29,307	25,785
R2	0.204	0.069

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.10

It is also found that real depreciations in the Turkish Lira are expected to be in favor of exports for both groups, indicating that the competitiveness gains channel outweighs the cost channel. However, in line with the literature the results also reveal that the exchange rate elasticity of exports for the high import intensive firms is relatively lower, as the costs of those firms are more affected by the course of exchange rates and mitigate the effects of competitiveness changes.

When the effects of the financial indicators are investigated, the estimation results show that deleveraging and increases in profitability indicators of ROA and ROE are

expected to favor high import intensive firms' exports more. Considering the effect of bank loans, the high import intensive firms' exports are found to be affected more positively by the increase in bank loans. It is not surprising, since the high import intensive firms are on average financially healthier and export relatively more, hence they have relatively easier access to bank loans and use these resources to finance their exports.

5.5.2 Heterogeneous Effects of Foreign Ownership

Following the literature, foreign ownership information is utilized as a proxy for the degree of integration to global value chains (GVC). When the base model is used to explain the export performances of the foreign-owned firms, it is found that those firms export regardless of the course of Turkish Lira. The not-foreign-owned firms on the other hand, respond to exchange rate movements, indicating that foreign ownership creates a heterogeneity across the two groups of firms. It is noted that both groups' exports are positively affected by the increase in foreign demand, although the foreign-owned firms' responds are more limited. These findings indicate that if a firm is more integrated to GVC through being owned by an international parent firm, it exports regardless of the level of real exchange rate (Table 5.5.1.2).

On the firm-level side, it is also found that exports of foreign-owned firms are less responsive to the changes in financial indicators. That is, the effects of profitability and liquidity ratios are smaller or even insignificant for the foreign-owned firms. However, the effect of bank ratio is considerably higher for the firms that are foreign-owned as they are probably having less problem accessing finance through bank loans and utilize those loans more to finance their exports.

Table 5.5.1.2

Results according to Foreign Ownership

	(1) Foreign Owned	(2) Not Foreign Owned
LogREER	-0.224	-0.197***
	(0.140)	(0.039)

Table 5.5.1.2 (continued)

LogFGDP	0.978**	1.212***
	(0.418)	(0.115)
LogLABOR	0.704***	0.558***
	(0.033)	(0.009)
LEV	-0.146***	-0.081***
	(0.046)	(0.014)
ROA	0.805***	1.173***
	(0.131)	(0.046)
ROE	-0.003	0.042***
	(0.022)	(0.008)
LIQ	-0.069	0.072**
	(0.128)	(0.033)
BANK	0.425***	0.319***
	(0.146)	(0.040)
Constant	2.244	0.357
	(2.649)	(0.730)
Observations	12,667	182,741
R-squared	0.081	0.049
Number of firms	2,059	40,329
R2	0.310	0.133

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.10

CHAPTER 6

CONCLUSION

Despite the importance of exports for the macroeconomic stability of the Turkish economy and the growing international literature, there have been fairly limited number of studies analyzing the export dynamics of the Turkish firms. The financial dimension of the firm heterogeneity remains even less explored. Although some of the financial indicators have been used as explanatory variables, they had not yet been put into the center of analysis. With this motivation and the extensive firm-level information our data base offers, in this paper we have focused on the effects of several key financial indicators on firms' exports. To this aim we have used a panel of 195,408 firm-year observations, consisting of 42,385 individual firms over the period 2010-2020 and estimated a regression where firms' real exports are explained by various financial indicators (leverage, liquidity, profitability ratios of returns on assets (ROA) and returns on equity (ROE) ratios and bank loans to total liabilities ratio) along with macro variables of real exchange rate (REER) and foreign demand.

We document that improvement in financial indicators is positively associated with firms' real exports. More specifically, profitability ratio of ROA is found to be most effective firm-level indicator, indicating that increased profitability has the most enhancing effect on the export performances. The leverage ratio on the other hand is found to be negatively related with the exports, implying that increased indebtedness would hinder the firms' real exports. The empirical results also reveal that bank loans have a stimulating effect on the real exports of the firms that are able to access those loans, as it allows them to finance their exporting investments. In that context, the size of a firm is found to be an important source of heterogeneity as the effect of bank loans ratio is shown to increase as the firms get larger. This crucial result is in line with the fact that larger firms have easier access to bank loans. Accordingly, the generally

smaller firms which have difficulties to access external resources are expected to rely more on internal resources to finance their exporting activities. In line with this expectation, the coefficient of the liquidity ratio is found to be significantly positive only for small firms, yet insignificant for medium and large firms.

Beside the effects of financial indicators, the effects of macro variables are shown to vary across different size groups. The estimation results are in line with the macro theory in the sense that while real depreciations in the Turkish Lira and improvement in foreign demand conditions are estimated to be positively associated with the real exports, the foreign demand is found to be more influential regardless of the sizes of firms. However, it is shown that as the firms get larger they get more responsive to fluctuations in the exchange rates, yet less affected by the changes in foreign demand.

We find that the responsiveness to macro environment varies considerably due to persistence in exporting. That is, the estimation results reveal that the permanent exporters adjust their exports according to foreign demand conditions, while they do not respond to exchange rate fluctuations. The exports of temporary exporters on the other hand, are found to be positively related with real depreciations. This result indicates that those firms may not be exporters structurally and may only be motivated to exploit the competitiveness gains due to relative price movements. We also show that temporary exporters' export performances are more responsive to the profitability, leverage and bank loans indicators. The relative importance of bank loans for the temporary exporters combined with the fact that liquidity ratio is found to be significant only for the permanent exporters may be interpreted that thanks to consistency in FX cash flows, permanent exporters can finance their exporting activities by internal resources more, while the temporary exporters may have to rely more on the external finance.

The age and technology intensity differences of firms are also found to be sources of heterogeneity for the exports. We show that as the firms get more experienced, they would get more competitive and export regardless of the exchange rate fluctuations. The younger firms on the other hand, try to exploit the competitiveness gains due to depreciation in Turkish Lira and increase their exports. They are also found to be more

financially constrained as the improvement in financial indicators have larger impact on their export performances. Furthermore, the estimation results reveal that while only the firms producing mid-low technology products respond to exchange rate fluctuations, as the technology intensity of products increases the responsiveness of exports to foreign demand conditions increases as well. We also show that profitability and liquidity indicators matter for the higher technology producers as they may be more successful directing those internal resources to finance their exporting activities.

In this study we also contribute to the literature regarding the heterogeneous effects of integration to global commodity chains (GVC). Accordingly, we find that as the firms get more integrated to GVC, their exports become less responsive to the fluctuations in the exchange rate. More specifically, we find in line with the literature that while increased share of imported inputs leads to lower exchange rate pass-through to exports, the multinational firms do not respond to exchange rate movements and adjust their exports solely according to foreign demand conditions. Similarly, the high import intensive firms are shown to be more affected by the global supply conditions as they are generally more integrated to GVC. Regarding the effects of financial indicators, the results reveal that deleveraging and increased profitability favor the high import intensive firms more. Those firms are also found to be more positively affected by the increased share of bank loans as they are on average larger, financially healthier and hence have easier access to bank loans, while the low import intensity firms are estimated to be more dependent on internal resources. Similarly, we show that the firms that are partially or fully owned by foreign investors are expected to have easier access to bank loans and they benefit from those external resources more as their exports are estimated to be affected more positively. The estimation results also reveal that exports of foreign-owned firms are less responsive to the changes in profitability and liquidity indicators, implying that the multinational firms tend to export more even after controlling for the heterogeneity of financial indicators.

The results obtained in this study provide important guidelines to policy makers, as they shed light upon the dynamics of exports at the micro level. Our results suggest that on average improvement in firms' financial health indicators lead to better export performances and due to certain firm characteristics, those indicators may have

heterogeneous effects. From a policy maker perspective, those heterogeneities should be considered while designing selective export promotion and financial stability policies. Specifically, the results indicate that the more profitable the firms, the more they tend to export. Hence trade and taxation policies that focus on improving firms' profitability by reducing the distortionary costs of government intervention are expected to increase firms' exports and in turn overall output. In addition to being a threat to financial stability, high firm leverage or indebtedness stands out as a phenomenon that policy makers should pay particular attention to, as it is also shown to negatively affect the export performances of firms.

Furthermore, firms need financial resources, whether internal or external, to finance their exporting activities. In that context, our study gives empirical evidence that being financially constrained hinders firms' export performances, hence firms need to have either adequate liquidity (internal resources) or access to financial loans (external resources). This finding suggests that policy makers should focus on reducing the level of financial constraints faced by firms to enhance their export investments. To this aim, considering the financial health of firms, fiscal authorities can put firm-based and selective credit support mechanisms into effect, and hence more efficient use of limited resources can be achieved. Via rediscount credits monetary policy can also play a similarly important enhancing role in this regard. Consequently, some firms that are profitable and competitive enough to export under normal conditions, but cannot meet the high fixed costs associated with exporting as they cannot access to bank loans, will be able to participate in exports. These set of policies are likely to be particularly relevant for small and medium sized enterprises (SMEs), whose investments are often constrained by the lack of finance.

Beside the sizes of firms, other heterogeneities should also be considered in the course of policy making. As it is shown in our study, experience and consistency in exporting bring resilience to exchange rate fluctuations via reducing the pass-through effect. Therefore, it is essential to adopt credit and tax policies that both encourage and necessitate consistency in exporting. In this context, financially healthy and profitable firms should be incentivized by relatively supportive tax and interest rates as long as they commit to exporting and fulfill these commitments.

For a country which is attempting to increase its share in the global export market improving its competitiveness in the high-value added production is a necessity. In this regard, it is critical to support the relatively higher technology producing exporters. Our study gives evidence that those higher tech firms tend to export structurally more as they are found to be more resilient to exchange rate fluctuations. This finding is especially worthy for the Turkish economy not only because of the negative reflections of high import dependency in especially higher tech products on the current account balance, but also because of the pass-through of the exchange rate to the inflation. In that context, supporting the higher tech producing firms via subsidies to R&D expenditures and providing easier access to financial loans would bring an improvement in the current account balance and alleviate pressures on the inflation.

Last but not least, we find that integration to the global value chains (GVC) has an important role in achieving structural improvement in the aggregate exports. The firm-level analysis implies that as the firms attract foreign investment, their export performances become less responsive to changes at both macro and micro levels. In other words, the more integrated the firms, the higher their tendency to be exporters structurally. This finding is in line with the macro-level analyses which show that foreign direct investments (FDIs) have stimulating effect on aggregate exports and economic growth. In this context, our results at the micro level confirm that in order to achieve more sustainable current account balance, policy makers should create an environment that would attract FDIs.

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APPENDICES

A. FURTHER EXPLANATIONS

Size Criteria

According to the small and medium sized enterprises (SMEs) definition of Ministry of Industry and Technology, following criteria were applied for the data by 2018:

Micro-Sized Companies: With respect to the employment criterion, companies with employment less than 10, or with respect to the total assets or net sales criterion companies with total assets or net sales less than 3 million Turkish Lira are classified as micro companies.

Small-Sized Companies: Companies with employment less than 50, or with total assets or net sales less than 25 million Turkish Lira are classified as small companies.

Medium-Sized Companies: Companies with employment less than 250, or with total assets or net sales less than 125 million Turkish Lira are classified as medium companies.

Large-Sized Companies: Companies with employment over 250, or with total assets or net sales over 125 million Turkish Lira are classified as large companies.

Table Appendix A.1

Autocorrelation Test Results

Inoue and Solo (2006) LM-test as postestimation					
Panelvar: fid					
Timevar: year					
p (lags): 2					
Variable	IS-stat	p-value	N	maxT	balance?
Post Estimation	3998.00	0.000	56364	11	gaps
Notes: Under H0, LM ~ chi2(p*T-p(p+1)/2)					
H0: No auto-correlation of any order.					
Ha: Auto-correlation up to order 2.					

Table Appendix A.2

Heteroskedasticity Test Results

Modified Wald test for groupwise heteroskedasticity in fixed effect regression model
H0: sigma(i)^2 = sigma^2 for all i
chi2 (56364) = 8.3e+38
Prob>chi2 = 0.0000

Table Appendix A.3

Results of the Base Model for the Full Sample Including Micro-scaled Firms

	(1)
LogREER	-0.153***
	(0.032)
LogFGDP	1.039***
	(0.096)
LogLABOR	0.596***
	(0.007)
LEV	-0.062***
	(0.011)
ROA	1.407***
	(0.034)
ROE	0.041***
	(0.006)
LIQ	0.048*
	(0.026)
BANK	0.325***
	(0.035)
Constant	0.858
	(0.607)
Observations	244,281
R-squared	0.068
# of firms	56,364
R2	0.161

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.10

B. APPROVAL OF THE METU HUMAN SUBJECTS ETHICS COMMITTEE

You may put the scanned version of your approval document.

C. TURKISH SUMMARY / TÜRKÇE ÖZET

Küresel ticaret dinamiklerini mikro ekonomik düzeyde daha iyi anlamak için firma heterojenliği olgusunun öne çıkarılması ve hesaplama yeteneklerindeki ilerlemenin ardından, firma heterojenliği ile firmaların ihracat davranışları arasındaki ilişkiye yönelik ampirik araştırmalar son yıllarda önemli ölçüde artmıştır. Bu çalışmalardan bazıları, ihracatla ilgili sabit maliyetlerin üstesinden gelme yeteneği açısından firmaların ihracat pazarına katılma kararının belirleyicilerini araştırırken, bazıları halihazırda ihracat yapan firmaların ihracat performanslarındaki heterojenlikleri araştırmıştır. Her iki yaklaşım da yalnızca yüksek verimliliğe sahip firmaların ihracatla ilgili sabit maliyetleri karşılayabileceğini ve üretkenlik artışlarının daha iyi ihracat performanslarına yol açtığını iddia ederek verimlilik farklılıklarını analizlerinin merkezine koymuşlardır. Diğer tüm değişkenler sabit tutularak firmaların finansal yapılarında heterojenlik olmadığı veya finansal piyasaların kusursuz olduğu varsayımı, verimliliği belirli bir eşiğin üzerinde olan tüm firmaların büyük olasılıkla ihracat yapabileceğine işaret etmektedir. Bununla birlikte, firmaların finansal göstergeleri de göz önüne alınmalıdır, zira pratikte finansal piyasalar kusurlu olabilmekte ve sadece finansal olarak daha az kısıtlı olan firmalar, ihracatın neden olduğu ek maliyetlerin ve yatırımların üstesinden gelmek için yeterli kaynakları sağlayabilmektedir. Verimliliği yüksek ancak ihracat yapmayan firmalar veya daha az verimli ancak ihracatçı olan firmaların varlığı da bu teoriyi doğrulamaktadır. Bu gerçeğe dayalı olarak son zamanlarda mikro düzeyde ihracat dinamiklerini daha iyi anlamak için firmaların finansal yapılarını firma heterojenliğinin ek bir katmanı olarak inceleyen çalışmalar ortaya çıkmıştır.

Firmaların finansal kısıtları ile ihracat davranışları arasındaki ilişki uluslararası literatürde oldukça iyi belgelenmiş olmasına rağmen, Türk firmaları nispeten daha az araştırılmış ve bu ilişki halen tam olarak anlaşılamamıştır. Her ne kadar Karamollaoğlu ve Yalçın (2020) ve Gül (2021) gibi bazı çalışmalar ihracat modellerine firma düzeyindeki bazı finansal göstergeleri dahil etmiş ve söz konusu değişkenlerin firmaların ihracat performansları üzerindeki yansımalarını ortaya koymuş olsa da

bildiğimiz kadarıyla firma heterojenliğinin finansal boyutunu analizlerinin merkezine koyan bir çalışma bulunmamaktadır.

Bu motivasyonla, çalışmamızda Türk firmalarının finansal göstergeleri ile ihracat performansları arasındaki ilişkiye odaklanıyoruz. Literatürle uyumlu olarak ve Türkiye'nin ihracatının büyük bir kısmının imalat sektörü tarafından yapılması nedeniyle bu çalışmada sadece imalatçı firmalar incelenmiştir. Bu doğrultuda, daha iyi finansal yapının daha iyi ihracat performansına yol açıp açmadığını göstermeye çalışarak imalatçı firmaların ihracat kararlarının belirleyicilerini araştırıyoruz. Ayrıca, makro değişkenlerle birlikte firmaların finansal göstergelerinin, farklı firma grupları genelinde ihracat performanslarını nasıl etkilediğini de inceliyoruz.

Bu çalışmada ilgili kamu kurumları tarafından TCMB'nin kullanımına sunulan iki ana veri tabanından yararlanılmaktadır. Bunlar, Türkiye Gelir İdaresi Başkanlığı ve Ticaret Bakanlığı'dır. Türkiye Vergi Usul Kanunu'na göre hazırlanan finansal olmayan Türk firmalarının yıllık bilanço ve gelir tablolarından oluşan ilk veri tabanı TCMB tarafından derlenmektedir. Bilanço kalemleri dışında bu gizli veri setinde çalışan sayısı, ölçek, yasal durum, kuruluş tarihleri, yabancı mülkiyet payı ve ekonomik faaliyet alanları gibi firma düzeyinde bilgiler bulunmaktadır. İkinci veri seti, her bir firmanın ticaret ortakları ile olan ticaret akışlarının miktarı ve değeri hakkında bilgi sağlayan aylık firma düzeyindeki gümrük verilerini içermektedir. Bu veri setinin kamu firmaları ve enerji ihraç eden firmalara ait verileri içermediği not edilmelidir. Gümrük verileri ile bilanço verileri birleştirilmeden önce, ihracat değerleri firma bazında ve yıllık bazda toplanır, ardından bu değerler 2 haneli sektörel ihracat fiyat endeksleri ile deflate edilerek her bir firma için yıllık reel ihracat değerleri oluşturulmuştur.

İhracat performanslarının firma düzeyindeki dinamiklerini analiz etmek için modelimizde çeşitli makro düzeyde ve firma düzeyinde değişkenler kullanıyoruz. Makro düzeydeki değişkenler için, Türkiye'nin 110 ticaret ortağının toplam ihracattaki ağırlıklarına göre reel GSYİH büyüme oranlarının ortalaması alınarak hesaplanan ihracat ağırlıklı küresel büyüme endeksini dış talep için vekil değişken olarak kullandık (Eren ve Yavuz, 2020). Makro düzeyde, Türkiye Cumhuriyet Merkez Bankası Elektronik Veri Dağıtım Sistemi'nden (EVDS) alınan tüketici fiyat endeksi

bazlı reel efektif döviz kurunu da kullanıyoruz. Reel kurdaki artış, göreli fiyat endekslerine bağlı olarak Türk Lirasının döviz sepeti karşısında reel olarak değer kazanması anlamına gelmektedir.

Son olarak, bu çalışmanın odak noktası, firmaların finansal durumlarının ihracat performansları üzerindeki önemini analiz etmek olması nedeniyle bilanço verilerinden elde edilen çeşitli firmaya özgü finansal göstergeleri modelimize dahil ediyoruz. Bu 5 değişken sırasıyla, kaldıraç oranı, likidite oranı, aktif karlılık oranı, öz kaynak karlılığı oranı ve banka kredileri oranıdır. Kaldıraç oranı, firmanın kısa vadeli borçlarının dönen varlıklarına oranı olarak tanımlanır. Forlani'nin (2010) tanımladığı şekliyle likidite oranı veya Finansal Bağımsızlık Endeksi, firmanın toplam iç kaynaklarının (öz kaynak ve nakit akışlarının toplamı) toplam varlıklara bölünmesiyle hesaplanır. Üçüncü ve dördüncü değişkenler, firmalar için karlılık göstergesi olarak kullanılan aktif karlılığı (ROA) ve öz kaynak karlılığı (ROE) oranlarıdır. Bunlar, dönem kârının (zararının) sırasıyla toplam aktiflere ve toplam öz kaynaklara oranı olarak tanımlanmaktadır. Tüm bu değişkenler literatürde firmaların finansal sağlık derecesini ortaya koymak için kullanılmaktadır. Bu çerçevede, likidite ve karlılık oranları ne kadar yüksek ve kaldıraç oranı ne kadar düşükse, firmanın finansal sağlığının o kadar iyi olduğu varsayılmaktadır. Banka kredileri oranı ise banka kredilerinin toplam yükümlülüklere oranıdır ve firma düzeyinde ticari kredilere olan bağımlılık derecesini gösterir. Son olarak, çalışmamızda firma büyüklüğünü kontrol etmek için çalışan sayısını (işgücü) kullanıyoruz.

Analizimizde kullanılan firma bazında veriler 2010-2020 dönemini kapsamakta olup, kamu sektörü firmalarına ait verileri içermemektedir. Örneklemimizi en az bir kayıtlı çalışanı olan imalatçı firmalar ve hem bilanço hem de gümrük verilerinin mevcut olduğu dönemle sınırlandırdık. Bu 11 yıllık dönemde örneklemimiz 1.274.426 firma-yıl gözlemi içerirken, bunların 254.752'si pozitif ihracat değerine sahiptir. Her yıl ortalama olarak yaklaşık 23.159 firma incelenirken, yaygın uygulamayı takiben, eksik veya tutarsız değerlere sahip firmaları hariç tuttuk ve aykırı değerleri en aza indirmek için her firma düzeyindeki değişken için verileri yüzde 0,1 düzeyinde vinzorize ettik. Nihai sonuç olarak, 245.089 firma yılı gözlemi içeren dengesiz bir panel elde ettik. Söz konusu örneklem firma büyüklüğü bakımından iyi çeşitlendirilmiş bir kümedir,

zira örneklemde yer alan firmaların ortalama %20'si mikro ölçekli firmalar, %44,5'i küçük firmalar, %25,1'i orta ölçekli firmalar ve %10,3'ü büyük firmalardan oluşmaktadır. Büyüklük sınıflandırması Sanayi ve Teknoloji Bakanlığı'nın küçük ve orta ölçekli işletme (KOBİ) tanımına göre yapılmıştır. Buna göre firmalar, istihdam ve net satış (veya toplam aktifler) kriterlerine göre sınıflandırılmıştır. Firma ölçeği bazında toplam ihracat incelendiğinde ise mikro, küçük, orta ve büyük firmaların ortalama ihracat paylarının sırasıyla %1, %6,5, %15,5 ve %77 olduğu görülmektedir.

Çalışmamızda farklı firma gruplarındaki firma heterojenliğini analiz etmek amacıyla, firmaları büyüklük dışındaki kriterleri kullanarak da sınıflandırdık. Öncelikle firmları sürekli ihracatçı olup olmama durumlarına göre iki gruba ayırdık. Buna göre bir firma, 11 yıllık sürenin en az 9'unda pozitif ihracat değerine sahipse sürekli ihracatçı olarak tanımlanmaktadır. Diğer firmalar geçici ihracatçı olarak tanımlanmaktadır. Firmaların büyüdükçe, daha kalıcı şekilde ihracat yaptıkları görülmektedir. Bu çerçevede, mikro ölçekli firmaların sadece yüzde 9'unun kalıcı ihracatçı olduğu, küçük firmalarda bu payın yüzde 19,5'e, orta ölçekli firmalarda yüzde 35'e ve büyük firmalarda yüzde 55'e çıktığı görülmektedir. Ayrıca, küçük ve orta ölçekli firmalar (KOBİ'ler) toplam kalıcı ihracatçıların yaklaşık yüzde 71'ini oluştururken, büyük firmaların payı yaklaşık yüzde 16'dır.

İkinci olarak, iş tecrübesinin ihracat performansları üzerindeki etkisini araştırmak için firmalar yaşlarına veya kuruluş tarihlerine göre sınıflandırılmaktadır. Bu doğrultuda, Türkiye ekonomisinin derin bir ekonomik kriz yaşadığı ve bu yıldan sonra birçok yapısal değişikliğin yaşanması nedeniyle 2001 yılı eşik yıl olarak alınmıştır. Beklendiği gibi, ortalama yaş veya deneyim firma büyüklüğü ile birlikte artmaktadır. Mikro ölçekli firmaların yaklaşık yüzde 20'sinin 2001 yılından önce kurulduğu görülürken, küçük, orta ve büyük ölçekli firmaların yüzde 31, 45 ve 60'ının bu yıldan önce kurulduğu görülmektedir.

Üçü olarak, firmalar teknolojik yoğunluklarına göre incelenmiştir. Bu amaçla, Eurostat'ın NACE Rev.2'yi temel alan ve teknolojik yoğunluğa göre imalat sanayi toplulaştırmasını kullanarak firmaları sektörlerine göre yüksek teknoloji, orta yüksek teknoloji, orta düşük teknoloji ve düşük teknoloji olarak kümelere ayırdık. Ancak,

yüksek teknoloji firmalarının sayısının diğer teknoloji gruplarına göre önemli ölçüde düşük olması nedeniyle, yüksek ve orta-yüksek teknoloji gruplarını tek bir grup oluşturmak üzere birleştirdik. Buna göre firmalar faaliyet gösterdikleri sektörlere göre bu üç teknoloji grubundan biri altında sınıflandırılmaktadır. Bu sınıflandırmada incelenen firmaların yüzde 36'sının düşük teknolojili üretim yaptığı, yüzde 31 ve yüzde 33'ünün ise sırasıyla orta-düşük ve orta-yüksek-yüksek teknolojili üretim yaptıkları görülmektedir.

Son olarak, firma düzeyindeki ihracat, firmaların küresel değer zincirlerine entegrasyon derecesi dikkate alınarak incelenmiştir. Bu amaçla, literatürde entegrasyon derecesi için vekil olarak kullanılan iki ayrı gösterge incelenmiştir. Öncelikle firmalar ithalata bağımlılık derecelerine göre incelenmektedir. Bu amaçla, yaygın bir uygulamayı izleyerek firma düzeyinde ithal ara mallarının değerinin satışların maliyetine bölünmesiyle hesaplanan oranlar belirledik. Bir firmanın medyan değerinden daha yüksek bir orana sahip olması durumunda, bu firma yüksek ithalata bağımlı olarak sınıflandırılırken, ithalat yoğunluk oranı bu eşiğin altında ise, bu firma düşük ithalata bağımlı olarak sınıflandırılmıştır. İkinci olarak Amador ve diğerleri (2021) gibi çalışmalarla uyumlu olarak entegrasyon derecesi için olarak yabancı sahiplik oranlarını vekil değişken olarak kullandık. Buna göre, TCMB Şirket Hesapları verilerinden yararlanılarak, yabancı sahiplik oranı sıfırdan büyükse firmaları (kısmen) yabancı sermayeli, diğer firmaları ise yabancı sermayeli olmayan olarak sınıflandırdık. Bu kriter, mikro ve küçük ölçekli firmaların yaklaşık yüzde 3,5'inin yabancı yatırımcılara ait hisselere sahip olduğunu, orta ölçekli firmaların yüzde 6'sının, büyük firmaların ise yüzde 15'inin yabancı sermayeli olduğunu ortaya koymaktadır.

Analiz döneminde makro değişkenlerin seyri incelendiğinde, ihracat ağırlıklı küresel büyümenin, küresel ekonominin Covid-19 salgını şoku tarafından ciddi bir şekilde etkilendiği 2020 yılına kadar istikrarlı bir artış eğilimi gösterdiği görülmektedir. Reel efektif döviz kuru ise aynı dönemde düşüş eğilimi gösterirken, Türk Lirası'ndaki reel değer kaybı 2016 yılından sonra daha belirgin hale geldiği dikkat çekmektedir. Buna göre, analiz dönemindeki makro gelişmelerin Türkiye'deki ihracat ortamını desteklemesi beklenmektedir.

Firmaya özgü değişkenler tarafında, ihracatçı firmaların finansal göstergelerinin Türk Lirası'ndaki reel değer kaybına paralel olarak 2016 yılından itibaren iyileştiği görülmektedir. Bu iyileşme eğiliminin 2018 yılından sonra daha belirgin hale gelmesi dikkat çekmektedir. Buna bağlı olarak bu dönemde karlılık ve likidite oranları artmış, kaldıraç (borçluluk) oranı ise azalarak ihracatçı bilançolarında iyileşmeye işaret etmiştir. Ayrıca, ihracatçı firmaların likidite ve karlılık koşullarındaki iyileşmeye paralel olarak banka kredilerine olan ihtiyacın azalmış olabileceğinden, banka kredilerinin toplam aktiflere oranı aynı dönemde düşüş eğilimi göstermiştir.

Çalışmamızın ampirik sonuçları, Chaney (2007) ve Bellone ve ark. (2010) çalışmalarının sonuçları ile uyumlu olarak Türkiye ekonomisi için finansal boyutun firma heterojenliğine ek bir kaynak oluşturduğuna ve finansal göstergelerdeki iyileşmenin firmaların ihracat performanslarını desteklediğine dair kanıtlar sunmaktadır. Daha spesifik olarak, örneklemin tamamı için, kârlılığın en fazla artırıcı etkiye sahip olduğu, banka kredilerine erişim kolaylığı ve likidite koşullarındaki iyileşmenin de imalatçı firmaların reel ihracatları üzerinde pozitif ve istatistiksel olarak anlamlı etkilere sahip olduğu tespit edilmiştir. Kaldıraç veya borçluluk oranındaki artışın ise ihracat performanslarını olumsuz etkilediği tespit edilmiştir. Bulgular, uluslararası ticaret teorisinin de işaret ettiği gibi, Türk lirasındaki reel değer kayıplarının ve dış talepteki artışların Türk imalat firmalarının reel ihracatını olumlu etkilediğini göstermesi nedeniyle makro teori ile de uyumludur.

Kapsamlı veri seti, ihracat performanslarındaki heterojenliği daha detaylı inceleyerek literatüre daha fazla katkı yapmamızı sağlamıştır. Çalışmamızda ihracatçı imalat firmalarını, firma büyüklüğü, ihracatta kalıcılık, yaş (deneyim), üretimin teknoloji yoğunluğu, ithal girdi yoğunluğunun derecesi ve yabancı sahiplik düzeyi dikkate alınarak farklı gruplara ayırarak, finansal göstergelerin ve makro değişkenlerin ihracat performansları üzerinde ne ölçüde farklı etkilerinin olabileceğini gösteriyoruz.

Çalışmamızda finansal göstergelerdeki iyileşmenin firmaların reel ihracatı ile pozitif ilişkili olduğunu belgeliyoruz. Daha spesifik olarak, aktif karlılık oranı, firma düzeyinde en etkili gösterge olarak bulunmuş ve sonuçlar artan karlılığın ihracat

performanslarını en fazla artırıcı etkiye sahip olduğunu göstermektedir. Kaldıraç oranının ise ihracat ile negatif ilişkili olması, artan borçluluğun firmaların reel ihracatını olumsuz etkilediğine işaret etmektedir. Ampirik sonuçlar ayrıca banka kredilerinin, bu kredilere erişebilen firmaların ihracat yatırımlarını finanse etmelerini sağlaması nedeniyle reel ihracatları üzerinde destekleyici bir etkiye sahip olduğunu ortaya koymaktadır. Bu bağlamda, banka kredileri oranının etkisinin firmalar büyüdükçe arttığı ve firma büyüklüğünün önemli bir heterojenlik kaynağı olduğu görülmektedir. Bu önemli sonuç, daha büyük firmaların banka kredilerine erişiminin daha kolay olduğunu ortaya koyan çalışmalarla da uyumludur. Buna göre, genellikle dış kaynaklara erişimde zorluk yaşayan daha küçük firmaların ihracat faaliyetlerini finanse etmek için iç kaynaklara daha fazla ağırlık vermeleri beklenmektedir. Bu beklenti doğrultusunda, likidite oranı katsayısının sadece küçük firmalar için anlamlı pozitif, orta ve büyük firmalar için anlamsız olduğu görülmektedir.

Finansal göstergelerin etkilerinin yanı sıra, makro değişkenlerin etkilerinin de farklı büyüklük gruplarına göre farklılık gösterdiği gösterilmektedir. Tahmin sonuçları, Türk Lirasındaki reel değer kayıpları ve dış talep koşullarındaki iyileşmenin reel ihracat ile pozitif yönde ilişkili olduğunu gösterirken, dış talebin daha etkili olduğunun tespit edilmesi açısından makro teori ile de uyumludur. Diğer yandan, firmaların büyüdükçe döviz kurlarındaki dalgalanmalara daha duyarlı hale geldikleri, ancak dış talepteki değişimlerden daha az etkilendikleri gösterilmiştir.

Çalışmamızda, makro ekonomik koşullara duyarlılığın, ihracattaki kalıcılık çerçevesinde önemli ölçüde değiştiğini bulduk. Tahmin sonuçları, kalıcı ihracatçıların ihracatlarını dış talep koşullarına göre ayarladıklarını, döviz kuru dalgalanmalarına tepki vermediklerini ortaya koymaktadır. Geçici ihracatçıların ihracatı ise reel değer kayıpları ile pozitif yönde ilişkili bulunmuştur. Bu sonuç, söz konusu firmaların yapısal olarak ihracatçı olmayabileceklerini ve yalnızca göreli fiyat hareketlerinden kaynaklanan rekabet gücü kazanımlarından yararlanmak için ihracat yapmaya motive olabileceklerini göstermektedir. Ayrıca, geçici ihracatçıların ihracat performanslarının karlılık, kaldıraç ve banka kredisi göstergelerine daha duyarlı olduğunu da gösteriyoruz. Geçici ihracatçılar için banka kredilerinin göreceli önemi ve likidite oranının sadece sürekli ihracatçılar için önemli bulunması bağlamında, döviz nakit

akışlarındaki istikrar sayesinde kalıcı ihracatçıların ihracat faaliyetlerini iç kaynaklarla finanse edebilecekleri, geçici ihracatçıların ise dış finansmana daha fazla yönelmek zorunda kalabileceği şeklinde yorumlanabilir.

Firmaların yaş ve teknoloji yoğunluğu farklılıklarının da ihracat için heterojenlik kaynağı olduğu tespit edilmiştir. Bu doğrultuda çalışmamızda firmaların tecrübe kazandıkça, döviz kurundaki dalgalanmalardan bağımsız olarak daha rekabetçi ve ihracat yapabildiklerini, genç firmaların ise Türk Lirası'ndaki değer kaybının getirdiği rekabet gücü kazanımlarını değerlendirerek ihracatlarını artırmaya çalıştıklarını gösterdik. Ayrıca finansal göstergelerdeki iyileşmenin ihracat performansları üzerindeki etkisinin daha büyük olması nedeniyle görece genç firmaların finansal olarak daha kısıtlı oldukları tespit edilmiştir. Ayrıca tahmin sonuçları, sadece orta-düşük teknolojili ürün üreten firmaların döviz kuru dalgalanmalarına tepki verirken, ürünlerin teknoloji yoğunluğu arttıkça ihracatın dış talep koşullarına duyarlılığının da arttığını ortaya koymaktadır. Çalışmada ayrıca, kârlılık ve likidite göstergelerinin, ihracat faaliyetlerini finanse etmek için söz konusu iç kaynakları değerlendirmede daha başarılı olabilmeleri nedeniyle yüksek teknoloji üreticileri için görece daha önemli olduğunu gösteriyoruz.

Bu çalışmada ayrıca küresel değer zincirlerine entegrasyonun heterojen etkilerine ilişkin literatüre de katkıda bulunuyoruz. Buna göre, firmalar daha fazla entegre oldukça, ihracatlarının döviz kurundaki dalgalanmalara daha az duyarlı hale geldiğini bulduk. Daha spesifik olarak, literatürle uyumlu şekilde ithal girdilerin payının artmasının döviz kurunun ihracata geçişkenliğinin azalmasına yol açtığı bulunurken, çok uluslu firmaların döviz kuru hareketlerine tepki vermediği ve ihracatlarını sadece dış talep koşullarına göre ayarladığı tespit edilmiştir. Benzer şekilde, yüksek ithal girdi yoğunluğu olan firmaların, genel olarak küresel değer zincirlerine daha entegre olmaları nedeniyle küresel tedarik koşullarından daha fazla etkilendikleri gösterilmiştir. Finansal göstergelerin etkileri ile ilgili olarak sonuçlar, borçluluk azaltmanın ve artan karlılığın yüksek ithal girdi yoğun firmaları daha fazla desteklediğini ortaya koymaktadır. Ortalama olarak daha büyük, finansal olarak daha sağlıklı ve bu nedenle banka kredilerine daha kolay erişebildikleri için, bu firmaların banka kredilerinin artan payından daha olumlu etkilendikleri, ithalat yoğunluğu düşük

olan firmaların ise iç kaynaklara daha bağımlı olduğu tahmin edilmektedir. Benzer şekilde, kısmen veya tamamen yabancı yatırımcı sahipliği bulunan firmaların, banka kredilerine erişiminin daha kolay olması nedeniyle bu dış kaynaklardan görece daha fazla yararlanmalarının beklendiğini gösteriyoruz. Tahmin sonuçları ayrıca, yabancı sermayeli firmaların ihracatının karlılık ve likidite göstergelerindeki değişikliklere daha az duyarlı olduğunu ortaya koyarak çok uluslu firmaların finansal göstergelerin heterojenliği kontrol edildikten sonra bile daha fazla ihracat yapma eğiliminde olduklarını ima etmektedir.

Bu bağlamda çalışmamız, Türkiye'deki firma düzeyinde heterojenlik literatürüne katkı sağlamanın yanı sıra, toplam ihracatta yapısal iyileşme sağlamak için gerekli firma odaklı politika uygulamalarının tasarımına da ışık tutabilir. Sonuçlarımız, firmaların finansal sağlık göstergelerindeki ortalama iyileşmenin daha iyi ihracat performanslarına yol açtığını ve belirli firma özelliklerinden dolayı bu göstergelerin heterojen etkilere sahip olabileceğini göstermektedir. Politika yapıcılar açısından bakıldığında, seçici ihracat teşviki ve finansal istikrar politikaları tasarlanırken bu heterojenlikler göz önünde bulundurulmalıdır. Spesifik olarak, sonuçlar, firmaların ne kadar kârlı olursa, o kadar fazla ihracat yapma eğiliminde olduklarını göstermektedir. Dolayısıyla, firmaların kârlılığını artırmaya odaklanan ticaret ve vergilendirme politikalarının, firmaların ihracatını ve dolayısıyla toplam ihracatı artırması beklenmektedir. Yüksek firma kaldıracı veya borçluluğu, finansal istikrar için bir tehdit olmasının yanı sıra, firmaların ihracat performanslarını da olumsuz etkilediğinin gösterilmesi nedeniyle politika yapıcıların özellikle dikkat etmesi gereken bir olgu olarak öne çıkmaktadır.

Ayrıca, bilindiği gibi firmalar ihracat faaliyetlerini finanse etmek için iç veya dış finansal kaynaklara ihtiyaç duymaktadırlar. Bu bağlamda çalışmamız, finansal olarak kısıtlı olmanın firmaların ihracat performanslarını olumsuz etkilediğine, dolayısıyla firmaların ya yeterli likiditeye (iç kaynaklar) ya da finansal kredilere erişime (dış kaynaklar) sahip olmaları gerektiğine dair ampirik kanıtlar sunmaktadır. Bu bulgu, politika yapıcıların ihracat yatırımlarını artırmak için firmaların karşı karşıya kaldıkları finansal kısıtların düzeyini azaltmaya odaklanmaları gerektiğini göstermektedir. Bu amaçla, mali otoriteler tarafından firmaların finansal sağlığı göz

önünde bulundurularak firma bazlı ve seçici kredi destek mekanizmalarını devreye alabileceği ve bu sayede sınırlı kaynakların daha verimli kullanımının sağlanabileceği değerlendirilmektedir. Reeskont kredileri aracılığıyla para politikasının da bu konuda benzer şekilde önemli bir artırıcı rol oynayabileceği vurgulanmalıdır. Sonuç olarak, normal şartlarda ihracat yapacak kadar kârlı ve rekabetçi olan ancak banka kredisine ulaşamaması nedeniyle ihracat yapmanın getirdiği yüksek sabit maliyetleri karşılayamayan bazı firmaların ihracat yapabilecekleri ön görülmektedir. Bu politika dizisinin, özellikle yatırımları genellikle finansman yetersizliği nedeniyle kısıtlanan küçük ve orta ölçekli işletmeler (KOBİ'ler) açısından önem arz edeceği düşünülmektedir.

Firmaların büyüklüklerinin yanı sıra, politika oluşturma sürecinde diğer heterojenlikler de dikkate alınmalıdır. Çalışmamızda da görüldüğü gibi, ihracatta yaşanan tecrübe ve istikrar, geçişkenlik etkisini azaltarak döviz kuru dalgalanmalarına karşı dayanıklılık sağlamaktadır. Bu nedenle, ihracatta istikrarı hem teşvik eden hem de zorunlu kılan kredi ve vergi politikalarının benimsenmesi elzemdir. Bu bağlamda finansal olarak sağlıklı ve kârlı firmalar, ihracat yapmayı taahhüt ettikleri ve bu taahhütlerini yerine getirdikleri sürece görece destekleyici vergi ve faiz oranları ile teşvik edilebileceği önerilmektedir.

Dünya ihracat pazarındaki payını artırmaya çalışan bir ülkenin katma değeri yüksek üretimde rekabet gücünü artırması da bir zorunluluktur. Bu bağlamda, nispeten daha yüksek teknoloji üreten ihracatçıların desteklenmesi kritik öneme sahiptir. Çalışmamız, söz konusu yüksek teknolojili ürün üreten firmalarının döviz kuru dalgalanmalarına karşı daha dayanıklı oldukları tespit etmesi nedeniyle, bu firmaların yapısal olarak daha fazla ihracat yapma eğiliminde olduklarına dair kanıt sunmaktadır. Bu bulgu, özellikle yüksek teknolojili ürünlerdeki yüksek ithalat bağımlılığının cari işlemler dengesine olumsuz yansımaları yanında, döviz kurunun enflasyona yansıması nedeniyle de Türkiye ekonomisi için özellikle önem arz etmektedir. Bu çerçevede, yüksek teknoloji üreten firmaların araştırma ve geliştirme (Ar-Ge) harcamalarına yapılacak sübvansiyonlarla desteklenmesi ve finansman kredilerine erişimin kolaylaştırılması cari dengede iyileşme sağlayacak ve enflasyon üzerindeki baskıları azaltacaktır.

Son olarak, çalışmamızda küresel değer zincirlerine entegrasyonun, toplam ihracatta yapısal iyileşme sağlamada önemli bir rolü olduğunu görüyoruz. Firma seviyesindeki analiz, firmaların yabancı sermaye yatırımı çektikçe, ihracat performanslarının hem makro hem de mikro seviyedeki değişikliklere daha az duyarlı hale geldiğini ima etmektedir. Diğer bir deyişle, firmalar ne kadar entegre olursa, yapısal olarak ihracatçı olma eğilimlerinin o kadar yüksek olduğu anlaşılmaktadır. Bu bulgu, doğrudan yabancı yatırımların (DYY) toplam ihracat ve ekonomik büyüme üzerinde destekleyici bir etkiye sahip olduğunu gösteren makro düzeydeki analizlerle de uyumludur. Bu bağlamda, mikro düzeydeki sonuçlarımız, politika yapıcıların daha sürdürülebilir bir cari denge sağlamak için doğrudan yabancı yatırımları çekecek bir ortam yaratmaları gerektiğine işaret etmektedir.

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