Export Behavior of Turkish Manufacturing Firms Under Crises

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January 2018

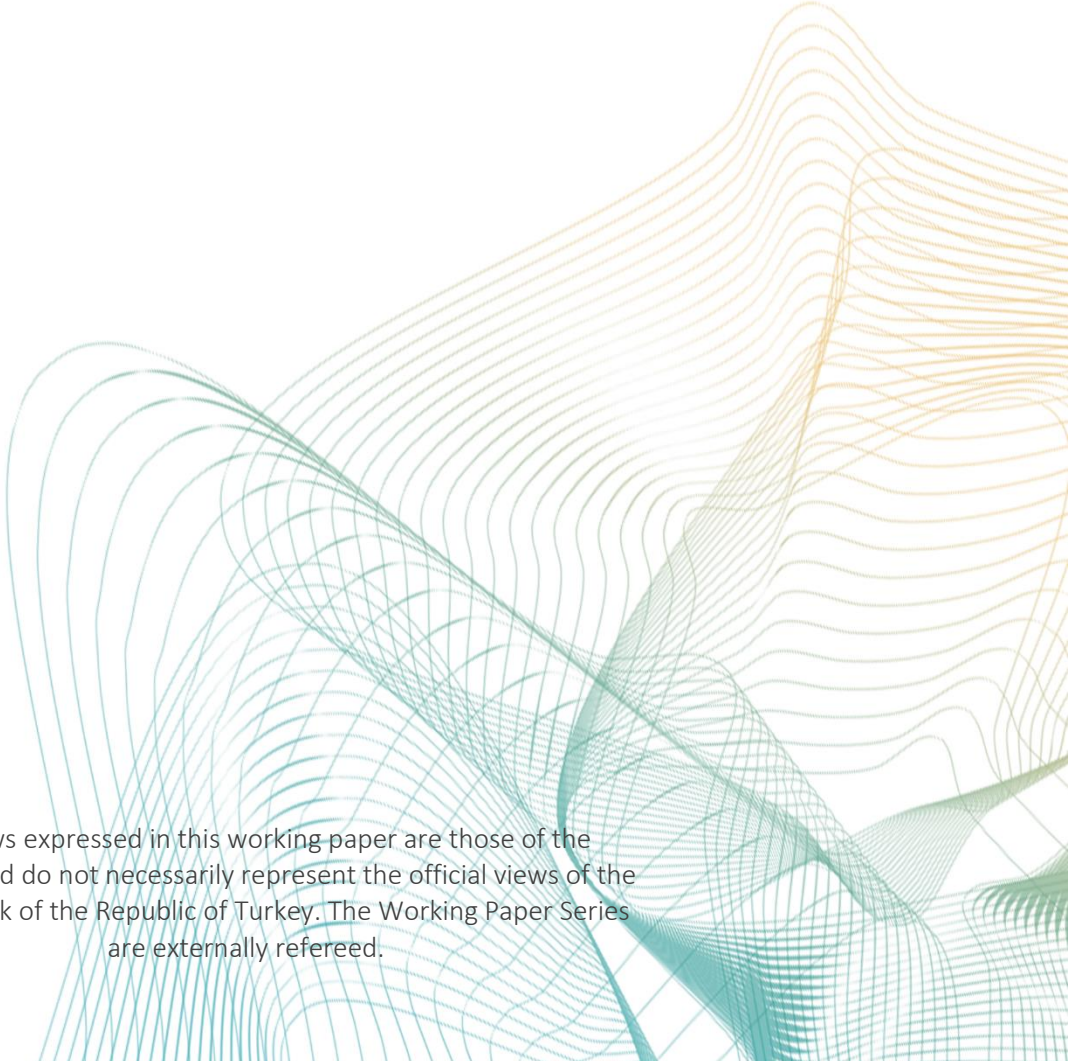# Export Behavior of Turkish Manufacturing Firms Under Crises

by

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Abstract

Turkey experienced three economic crises in recent decades that provides natural experiment environment for researchers. In this paper, we studied the impact of recent three different economic crisis on export behavior of Turkish manufacturing firms using firm level annual panel data for 1990-2014 period. By investigating the impact of crisis on both the decision to become an exporter and volume of exports, export behavior of Turkish manufacturing firms under crisis is diagnosed. Estimation results reveal differentiated impact of different types of crisis on export behavior of Turkish manufacturing firms. According to the results, export boom observed with 1994 crisis was mainly due to the increase in extensive margin. Devaluated currency together with shrinking domestic demand in 1994 crisis lead to an increase in export propensity of the firms. Although sharp currency devaluation and domestic demand contraction supported incumbent exporters to increase their export volume, the accompanied credit crunch in 2001 crisis hindered entrance of new firms into export markets. Significant international trade collapse with 2008 global financial crisis caused declines in both export propensity and export volume of the Turkish manufacturing firms. These findings have implications on both what types of export promotion and incentives should be provided (or not) and to whom this assistance should be provided for dissimilar shocks in an emerging market economy like Turkey.

Keywords: Export behavior, crisis, firm-level data, Turkey, logit model, selectivity correction

JEL codes: F14, L25, C23, C25

Özet

Bu çalışmada, Türk imalat sanayi firmalarının ekonomik kriz dönemlerindeki ihracat davranışları yayılma marjı (ihracatçı olma kararları) ve yoğunlaşma marjı (ihracat hacmi) çerçevesinde ele alınmıştır. 1990-2014 dönemine ait yıllık firma bazlı panel veri kullanılarak yapılan analizler krizlerin firmaların ihracat davranışları üzerinde farklı etkileri olduğunu ortaya koymaktadır. Daralan iç talep ve Türk Lirasının yüksek oranlı değer kaybı ile karakterize olan 1994 krizi firmaların ihracat piyasalarına girişini teşvik ederek toplam ihracatın yayılma marjı kaynaklı artmasına neden olmuştur. Ciddi oranda kredi sıkışıklığı ve iç talepte daralmanın yaşandığı 2001 bankacılık krizi sonrası ise ihracatçı olma eğilimi azalırken (yayılma marjı) toplam ihracattaki artışta mevcut ihracatçı firmaların ihracat hacimlerindeki artış (yoğunlaşma marjı) etkili olmuştur. Son olarak, 2008-2009 krizinde dış talepteki çöküşle birlikte ihracat gerek yayılma gerekse yoğunlaşma marjlarındaki düşüşle birlikte önemli oranda daralmıştır. Bu çalışma, Türkiye özelinde gelişmekte olan ekonomiler için, farklı şoklar altında ihracatı destekleyecek uygun politikaların geliştirilmesine yardımcı olacak bulgular içermektedir.

Anahtar kelimeler: İhracat davranışları, kriz, firma verisi, Türkiye, logit, seçilmişlik düzeltmesi

JEL kodları: F14, L25, C23, C25

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Non-technical summary

Export is a must for sustainable growth. With the recent global financial crisis, studying financial shocks-export relation at firm-level becomes one of the hottest topics in international trade literature. Investigation of the export behavior of the Turkish manufacturing firms during the crisis has crucial importance since manufacturing export usually considered as a way for riding out the crisis. Hence, for Turkish economy, understanding firms' responses in the wake of crisis is important for reducing the costs of the crisis.

Turkey has been hit by several times by different type of economic crises in the last twenty years and consequently, Turkish economy, undoubtedly, provides a good case for studying the crisis. This paper investigates export behavior of firms under different types of economic shocks using firm-level annual panel data for 1990-2014 period. More precisely, we explore the impact of 1994, 2001 and 2008 crises on firms' exportation decisions and export volume decisions.

Our results show that export behavior of the firms varies under different types of crisis. In the 1994 crisis which characterized by high devaluation and contracted domestic demand, caused exports boom through increasing export propensity. Large devaluation caused by 1994 crisis encourages smaller and better performing firms' foreign market entrance. For the case of 2001 crisis which is characterized by contraction of credit supply, the importance of external finance for firm's export decisions become obvious. Credit constraints of the firms not only affect the export participation decision but also it affects survival of exporters in international markets. We observe that the self-selection of exporters becomes invalid in the existence of credit crunch and only those firms that can find sufficient external finance for covering the trade costs are able to enter into export markets. During the periods of economic turmoil characterized by credit crunch accompanied by severe foreign demand contraction like in the case of the recent global financial crisis, in addition to credit constraints, non-price competition come to the forefront. Our results show that investing quality production not only ease export market entry but also increases firm's survival probability in export markets.

These results have policy implications for promoting exports. Better (consistent) exporters tend to be larger, less liquidity constrained, and more productive firms. However, global crisis where an exporting country's foreign markets contract may strain even those better performing firms. In case of a domestic contraction without a credit crunch, export promotion policies may be targeted to increase the number of exporters (i.e. smaller firms). When there is a contraction with a credit crunch, larger, more productive players could be given priority to help increase their penetration in their export markets. In order to hold export sector ready for global shocks, awareness for the importance of non-price competition has to be created. Firms have to be aware of the fact that a lower price is not the only way of competing and they can be encouraged to strengthen competition power by investing to quality production, customer satisfaction and after sale services.

1 Introduction

Exports play a crucial role for an economy due to its close relation with employment, economic growth and current account deficit. Export is one of the component of aggregate demand and growth in exports causes higher economic growth that in turn creates employment. The strength of exports is the main determinant of the current account deficit. Hence, steady and increasing export pattern is one of the most important components of sustainable growth. With this respect, large fluctuations in exports are undesirable. The most obvious source of significant fluctuations in exports is economic turmoil. Therefore, understanding the conjectural and behavioral components affecting firms' export decisions during turmoil periods can contribute considerably for designing effective policies supporting economic stability. Consequently the aim of this paper is to investigate the impact of crises with different characteristics and dynamics on export decisions of the Turkish manufacturing firms.

Especially with the recent global financial crisis the empirical literature has been focused on the impact of crisis on export margins. For Belgium, Muuls (2008), for Italy, Minetti and Zhu (2011), and for India, Kapoor et al. (2012) concluded that credit constraints occurred during crisis affect both extensive and intensive margin of exports. Amiti and Weinstein (2011) used Japanese firm-level data and documented the impact of deteriorating banking sector health on declining exports in the 2008 crisis. Bernard et al. (2009) investigated the impact of the Asian crisis on US exporters and found that most of the reduction in US exports came from the intensive margin. Bricongne et al. (2010) studied the export behavior of French firms in the 2008-2009 crisis. They concluded that while large exporters mainly decreased their export sales, smaller exporters were forced to cut on the number of their destinations or ceased exporting altogether. Behrens et al. (2010) using Belgian firm-level data investigated the determinants of the country's trade decline during the 2008-2009 crisis. They found that this decline was due to the intensive margin of trade; impact of the extensive margin was limited. Unlike others, Bellas and Vicard (2014) investigated the impact of various past crises on French exports. They first classified crises into banking crises, currency crises, twin crises, and other crises. They documented a prevalence of the intensive margin of adjustment to large shocks (i.e. firms reducing their average sales). They found that the extensive margin of trade was dominant in currency crises and that the extensive margin was more responsive to demand.

As it was mentioned above, the core objective of this paper is to investigate export behavior of the Turkish manufacturing firms under different crises. Therefore, we focus on the crises of 1994, 2001 and 2008 that Turkey experienced and try to explore how firms' export behavior changed during these different economic crisis. To do so, using firm-level panel data set covering 1990-2014 period, extensive margin through export propensity and intensive margin through export volume is investigated via different panel estimation methods.

The analysis, which carried out with 108,085 observations from 12,431 firms that were active in the manufacturing sector between 1990 and 2014, reveal that export behavior of Turkish manufacturing

firms vary under different types of crises. The 1994 and 2001 crisis originated from internal dynamics whereas 2008 crisis stemmed from global developments. The 1994 crisis were mainly characterized by high interest rates and inflation, severe domestic demand contraction and currency devaluation. Our results show that under these conditions export propensity of the firms increased. Although still better firms are self-selected into export markets, smaller firms export volume increased more when compared to large firms. Despite many similarities, the most important feature that distinguishes the 2001 crisis from the 1994 crisis is the credit crunch that economy exposed to at that time. This difference shaped the export behavior of the firms in that period. Credit constraint was the fundamental determinant of the firms' export decisions. External financing not only determined export propensity but also it was crucial for the survival of incumbent exporters in international markets in the 2001 crisis. Estimation results reveal that in the case of the recent global crisis in which credit crunch accompanied by severe foreign demand contraction in addition to credit constraints, non-price competition plays important role on the exportation decisions of the firms. Investing quality production not only ease export market entry but also increases firm's survival probability in export markets. Therefore, our findings reveal the importance of appropriate export policy implementation against different shocks for consistent and sustainable exports.

The plan of the paper is as follows. In the next section, we summarize macroeconomic developments in 1990s and 2000s in order to understand dynamics and characteristics of the economic crises that the Turkish economy experienced. In the third section, we discuss our data set and provide a descriptive evaluation of changes in the extensive and intensive margins over time. In the fourth section, we discuss our empirical results. In the last section, we briefly conclude.

2   Three Latest Major Crises in Turkey

The process of trade liberalization and market-oriented economic reforms had started in Turkey with the so-called "24th of January Decisions" in 1980. For the Turkish economy instead of "import substitutive" policies, Turkey relied on free trade regime and has begun to implement "export-led growth model" since the 1980's. During the 1990's with more liberalized trade and capital accounts, Turkish economy became more fragile against external shocks. Since then, Turkish economy experienced several disruptive economic downturns. Three severe ones occurred in 1994, 2001, and 2008.

The common view about the first triggering episode of the 1994 crisis was the government's ill-fated attempt to mitigate the public debt burden with Central Bank cash advances, after cancelling auctions of short-term Treasury bills in the last month of 1993. When the government's 1994 budget failed to contain fiscal measures for tightening, the anxiety in the financial markets triggered a downgrading of Turkey's credit score in January 1994. Decreasing borrowing ability of government from domestic market led it to rely more on cash advances from the Central Bank. Excess liquidity induced imbalances between the official and market exchange rates. Depreciation of Turkish Lira directed commercial banks and depositors to foreign exchange. Central Bank's intervention to the exchange rate resulted with the loss of half of the international reserves. The overnight interest rates increased sharply from 70 percent in January to 700 percent in March. The main features of the 1994 crisis were thus summarized as

follows by Yücel and Yıldırım (2010). The crisis has begun at the end of 1993 and broke out in 1994, the current account deficit increased to 6.4 billion dollars from 1 billion dollars, outstanding external debt increased about 12 billion dollars, the interest rates exceeded 400 percent, the whole sale price index reached to 121 percent and the consumer price index reached to 106 percent. Moreover, unemployment rate hit to 20 percent and economy contracted by 5.5 percent. Turkish economy collapsed. The gross domestic production (GDP) level development shows the devastating impact of the crisis more clearly; level of GDP fell to its 1989-1990 level (Figure 1).
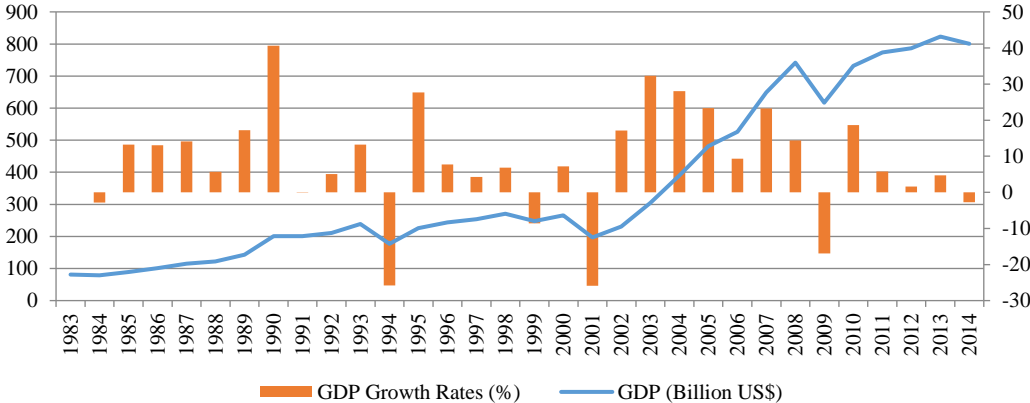

Figure 1. Annual GDP (Billions US $) and Annual GDP Growth Rate (%), 1990-2010

Source: TURKSTAT; Ministry of Development Economic and Social Indicators (1950-2010).

Despite observed losses in the overall economy, the performance of exports during 1994 crisis was splendid. The goods exports increased by 18 percent and 19.5 percent respectively in 1994 and 1995, which were considerably above the average growth rates (Figure 2). It seems that sharp contraction of domestic demand and highly devaluated Turkish Lira with 1994 crisis increased export motivation.
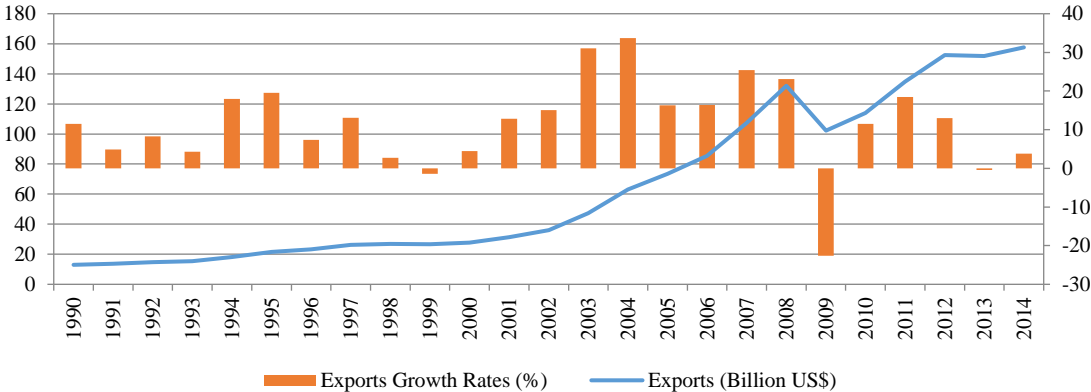
Figure 2. Exports (Billions US $) and Annual Growth Rate (%), 1990-2010

Source: TURKSTAT, CBRT Electronic Data Delivery System

Although, contribution of this impressive export performance on the course of recovery is disputed, immediate high growth pace following the crisis leads to the characterization of the 1994 crisis as short term but severe. The post-crisis high growth rates facilitated achieving pre-crisis GDP level in short period. However, with consecutive unfavorable developments, the recovery phase lost momentum.

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Russia financial crisis in 1997, Asia financial crisis in 1998 and lastly the earthquake that struck the most industrialized part of Turkey, Kocaeli, in 1999 caused 3.4 percent decline in GDP. While the adverse effect of the earthquake was ongoing, Turkey encountered another severe crisis in 2001.

At the end of 1999,Turkey started IMF supported Disinflationary Program with crawling peg exchange rate anchor in order to overcome the economic instability caused by chronic high inflation and undisciplined financial system. Initially this stabilization program served the purpose; inflation started to fall, the capital inflows accelerated, interest rates strongly decreased and the private consumption sharply increased with the low costs of bank credits (Akyüz and Boratav, 2002). Relatively low interest rates and appreciation of Turkish Lira led to the acceleration of the imports through the motivation of meeting the increasing domestic demand. On the other hand, appreciated currency and high domestic demand slowed down the exports; this led to widening current account deficit. The current account deficit GDP ratio reached nearly 4.9 percent at the end of 2000 whereas it had been 0.7 percent at the end of 1999. In addition to the widening current account deficit, failure to achieve the privatization goals increased the anxiety in the financial markets and created doubts about the sustainability of the program (Ari and Dagtekin, 2007).

The first sign of the financial crisis arose in the form of liquidity problem of some medium sized banks. In November 2000, interest rates increased significantly because of banks' attempts to close their foreign exchange open positions. This caused capital outflows and increased the country risk. In order to prevent deepening of the crisis, Central Bank preferred to provide extra liquidity to the troubled banks by violating the stabilization program. After this action, government made a new agreement with IMF and new monetary program was announced by Central Bank in 22 December. This new program, albeit for a short period, calmed the turmoil by the end of 2000. By mid-January, international reserves had been refilled and interest rates had fallen to the pre-November level.

Ensuing political crisis hit the economy in a devastating way and triggered a financial crisis. Stock market declined by 18 percent. The overnight interest rate rose abruptly to 2000 percent on 20 February and 4000 percent on 21 February. Exchange rate peg was not sustainable anymore and on 22 February, authorities adopted a floating exchange rate regime, which led to a depreciation of Turkish Lira by 40 percent against the dollar.

The impact of the 2001 crisis on the banking sector was severe. Eleven banks were taken over by the Saving and Deposit Insurance Fund (SDIF) in the period of November 2000 and February 2001 (BRSA Turkey, 2010) and total number of brunch offices reduced by 11.7 percent (Yücel and Yıldırım, 2010). Collapse of the banking sector, increase in interest rates and devaluation of the Turkish Lira hit the real sector harder. Turkish economy contracted by 5.7 percent and GDP level dropped to the level of 1995 (Figure 1). This time the cost of crisis was much more when compared with 1994 crisis, economy move backward about six years. Moreover, 2001 crisis hit manufacturing sector profoundly, 4146 firms were closed in the first three months of the crisis[3], upward trend started in the unemployment rate and investments came to a standstill. The contraction reached to 9.4 percent in the manufacturing sector. The only positive news is that as in 1994 crisis, the upward trend in exports has been preserved in 2001 crisis (Figure 2). In spite of deep contraction, again strong and decisive recovery period observed during

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[3] Radikal daily, April 29, 2001.

2002-2007 period. The average annual real GDP growth was 6.8 percent and in two years, pre-crisis GDP level attained (Figure 1).

Following the post-crisis reforms, banking sector in Turkey recovered. Moreover, Turkey's economy enjoyed the macroeconomic stability by post-crisis tight money and fiscal discipline policies. Stable high growth rates, single-digit inflation rates, appreciated real exchange rates and relatively low interest rates. Impressive progress of Turkish economy during 2002-2007 period attracted large capital inflows, especially in the form of foreign direct investments (FDI) when compared with its own past performance. FDI inflows into Turkey grew strongly to USD 22.2 billion in 2007, almost twentieth times the USD 1.14 billion recorded in 2002 (Vural and Zortuk, 2011). During 2002-2007, despite Turkish Lira's real appreciation, exports also displayed good performance as shown in Figure 2.

As for the 2008-2009 crisis, severe demand contraction in Turkey's most important trade partner, Europe, affected primarily the exporting sector with negative spillovers to other sectors. Contraction in global liquidity and increasing uncertainty in the international markets forced the banks to maintain a liquid position. Since the fragile banks were eliminated during the previous crisis, Turkish financial sector weathered the storm well with no banks going bankrupt.

Notwithstanding the experience of many former crises, the recent global crisis was unusual for the Turkish economy. The recent crisis arose mainly due to external factors unlike previous endogenous economic crises. The impact of this unexpected crisis was felt in late 2008 and the economy contracted by 4.8 percent in 2009. Turkish lira's depreciation remained limited (7.3 percent) compared to the 1994 and 2001 crises. However, unlike in the previous crises, exports declined by 22.6 percent in 2009.

These three recent crises had significant distinctive features. While the 1994 and 2001 crises originated from internal dynamics, 2008 crisis stemmed from global developments. The main characteristics of the 1994 crisis, shrinking domestic demand and a devalued currency, can be regarded as stimulating influences for exports. Like the 1994 crisis, 2001 crisis can be characterized by shrinking domestic demand and a devalued currency. However, the distinctive feature of 2001 crisis from 1994 crisis was the existence of severe credit crunch that challenged both exporters and non-exporters. On the other hand, domestic demand contraction and devaluation of the currency was relatively limited for the case of 2008 crisis, but there is a sharp decline in foreign demand and dwindling international liquidity that caused difficulties mainly for exporters.

All told, such different dynamics during the three major crises in Turkey's recent past provide us with a rich laboratory to document and understand exporting behavior of manufacturing firms, both on the extensive and intensive margins. This, we will exploit in the next two sections.

3   The Data Set and Descriptive Analysis

3.1   The Data Set

In this paper, the Central Bank of the Republic of Turkey (CBRT) Company Account dataset is used. In order to monitor developments regarding real sector CBRT collects annually financial statements since 1990 with participation, cooperation and support of the firms. The dataset contains mainly, balance sheets, income statements and firm-specific information such as employment of financial and non-financial firms. We only consider manufacturing sector in our analysis since goods export dominates total exports. The sample covers 108 085 observations, corresponding to 12 431 manufacturing firms within 1990-2014 period.

3.2 Variables

In the first part of the empirical models, we examine the impact of crises on the extensive margin of export by modeling the export propensity of the firms during the crises. Given considerable differences in export behaviors of export starters and incumbent exporters, we model probability of exportation of pre-crisis exporters (Model 1) and non-exporters (Model 2) explicitly[4]. Hence different from other applications[5], instead of using full set of firms, the export propensity of the firms is investigated for export starters and continuous exporters separately. For Model 1 the firms that are non-exporters during the pre-crisis period are selected. The pre-crisis non-exporting firms are determined as those firms that did not have any positive foreign sales in the last two years before the crisis year. More precisely, the firms that did not export in 1991 and 1992 constitute the estimation sample for 1994 Crisis of Model 1. Firms that did not export in 1998 and 1999 constitute the estimation sample for 2001 Crisis of Model 1, and firms that did not export in 2005 and 2006 constitute the estimation sample for 2008 Crisis of Model 1. As it was mentioned before, Model 2 is used for modelling the likelihood of pre-crisis exporters to continue exporting during the crisis. Firms that are exporters during the pre-crisis period constitute the estimation sample of Model 2. The pre-crisis exporters are determined as those firms that have positive foreign sales in the last two year before the crisis. With this specification, for 1994 crisis the firms that exported in 1991 and 1992 constitute the estimation sample, for 2001 crisis firms that exported in 1998 and 1999 constitute the estimation sample and lastly firms that exported in 2005 and 2006 constitute the estimation sample for 2009 Crisis of Model 2. In the second part of the empirical models, impact of crisis on intensive margin is investigated. Export volume defined as foreign sales derived from income statements of the firms.

In the selection of firm-specific variables that are used in explaining export behavior of the firms, we used previously conducted studies as a guidance. It has been shown that exporters are larger, more productive, financially healthier firms. This is expected since exportation involves extra fixed costs and requires additional investments for R&D, quality production and customer satisfaction. To this respect, in our models, we use firm-specific measures for size, partial labour productivity, credit constraint, profitability, technology intensity and non-price competition. These are expected to be positively related to export performance. In considering firm size dummies are used and firms are classified as micro, small, medium, and large, according to the number of employees, using the standards designated by Eurostat.[6] For measuring firm-level productivity, we prefer partial labor productivity which is defined as real net sales per employee mainly for practical purposes.[7] Profitability is considered as another indicator of the efficiency of the firms and defined as the ratio of operating profit to net sales. Exporters usually are expected to have higher quality production. Technology usage and innovation are the prerequisite for quality production. In this respect, the ratio of R&D expenditure to operating expenses is used as a proxy for technology usage and the capital-intensity variable is defined as real tangible assets per worker are used in the analysis.[8] Non-price competition defined as the ratio of marketing, advertisement, and distribution expenditures to operating expenses is used as an alternative quality

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[4] Another reason for this approach is that as Özler et al. (2009) and Demirhan-Atabek (2015) verified it, previous export market experience has significant effect on the propensity to become exporter.

[5] This setting is used by Blalock and Roy (2007) for examination of Asian export puzzle.

[6] A firm is classified as micro if the total number of employees are less than 10, as small if that number is between 10 and 49, as medium if the total number of employees is between 50 and 249 and as large if the total number of employees exceeds 249.

[7] Sales are deflated by sectoral producer price indices.

[8] To convert tangible assets into real terms, sectoral producer price indices are used.

measure in our analysis. In order to capture financial health of the firms, credit constraint variable is defined as the ratio of bank loans to total liabilities. As the ratio approaches zero, it shows the severity of the credit constraint. A positive relationship is expected between export performance and the financial health of the firm. To account for sectoral differences, we use sector dummies according to NACE Rev. 1.1 2-digit manufacturing sector. For capturing macroeconomic developments, year dummies are used and in order to absorb time-varying industry specific shocks industry-year interacted fixed effects are considered in the models.

3.3   Descriptive Analysis

The first signs of behavioral changes caused by the crisis can be obtained from transition rates. Transition rates show the transition of firms that are evaluated by considering export status of the firms for two consecutive years.

Table 1. Transition Rates and Resulting Export Status

Year t status	Non-exporter		Exporter	
Year t+1 status	Non-exporter	Exporter	Non-exporter	Exporter
Resultant Export Status	*Continuous Non-Exporter*	*Export Starter*	*Export Quitter*	*Continuous Exporter*
Pre 1994 Crisis (1990-93)	84.8%	15.2%	18.6%	81.4%
1994	67.5%	32.5%	7.2%	92.8%
Post 1994 / Pre 2001 Crisis (1995-2000)	80.8%	19.2%	7.4%	92.6%
2001	78.4%	21.6%	6.2%	93.8%
Post 2001/ Pre 2008 Crisis (2002-2007)	81.3%	18.7%	5.5%	94.5%
2008-2009	78.1%	21.9%	5.5%	94.5%
Post 2008 Crisis (2010-14)	80.4%	19.6%	6.3%	93.7%
Overall Average (1990-2014)	**80.0%**	**20.0%**	**7.3%**	**92.7%**

Source: Author's own calculations.

Note: A firm that does not export for both of the consecutive years is named as continuous non-exporter and a firm that exports for both of the consecutive years is named a continuous exporter. When a non-exporting firm starts to export in the following year, it is categorized as export starter and when an exporting firm ceases to export in the next year, it is called a quitter. Following transition rates over time is expected to signal the possible effects of the crisis on the firms' exporting behavior.

Transition rates in Table 1 clearly indicate some degree of persistence in the export status. On average 80.0 percent of the previous year's non-exporters continue to be non-exporter in the current year and on average 92.7 percent of the previous year's exporting firms continue to export in the current year. Although, trends in entering into and surviving in export markets do not exhibit a significant change over time; crisis periods are an exception. Actually, trends in export decisions vary in crisis periods with different peculiarities.

Crises stimulated the movements across states for non-exporters. In general, during the crisis years the shares of export starters increased and were above the average. The highest value of export starters' share is 32.5 percent in 1994 crisis, which is considerable above the overall average share of export starters (20 percent). In 2001 and in 2008/09, the shares of export starters were 21.6 percent and 21.9 percent respectively. Table also shows that export quitters share was high during the pre-1994 crisis period. With 1994 crisis, the share of export quitters decline to 7.3 percent from (average) 18.6 percent and continue to decline over time. Although shares vary over time, the persistence of the export status is high. This can be an indication for the existence of sunk-cost, which was shown in previously

conducted studies.[9] Another indication for the existence of sunk-cost is that for the case of 2008 crisis, despite 22.6 percent contraction, the share of export quitters maintained its low level (5.5 percent).

In Figure 3, distribution of the firms according to the exporter type is given. The proportion of exporters increased over time. With the 1994 crisis, there was notable increase in the export starters. From then, the share of exporters has increased considerably. However, the 2001 and 2008 crisis lead to a limited increase in the share of export starters.
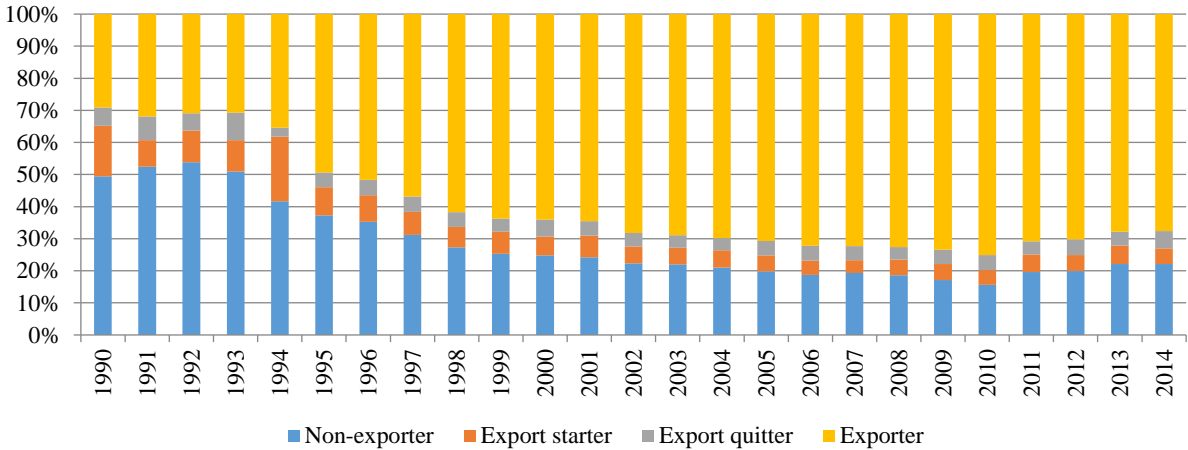

Figure 3. Distribution of the Firms According to the Exporter Type.

In Figure 4, exports-net sales ratio as percentages is given for export starters and continuous exporters.
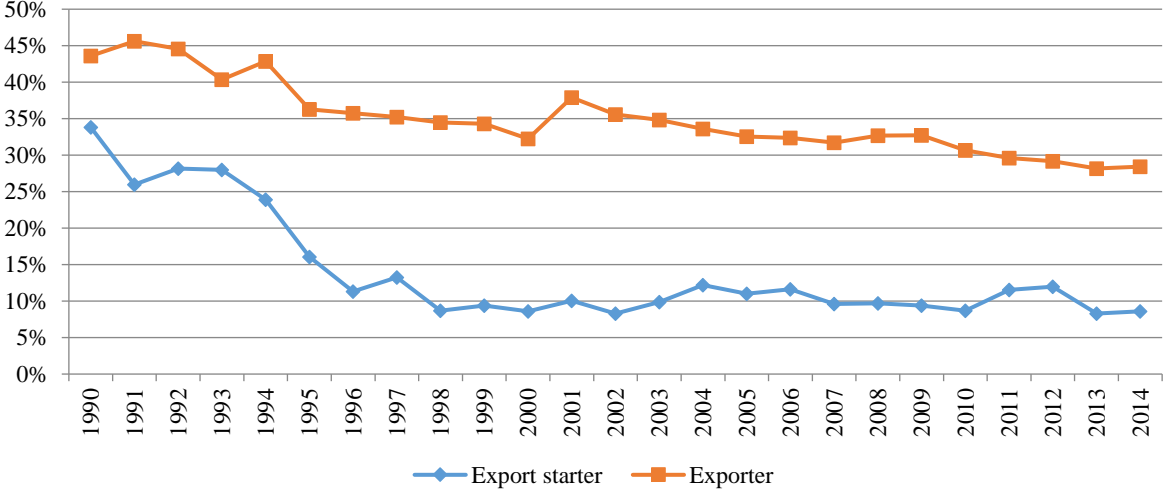

Figure 4. Foreign Sale Intensity of Continuous Exporters and Export Starters.

The figure shows that during 1994 and 2001 crisis, exports volume of incumbent exporters increased whereas in 2008-2009 crisis it declined.

9 See Özler et al. (2009) and Atabek-Demirhan (2015)

The descriptive analysis given above is just a general snapshot for the exporting behavior of the firms during crisis. In the following section, using firm-level data, we will analyze the effect of the crisis on export behavior in details.

4 Econometric Estimation

The recent international trade literature has focused on modeling export behavior of the firms through considering extensive margin (i.e. the set of exporters) and intensive margin (i.e. the volume of exported by an exporter) separately. This is mainly because in the setting developed by Melitz (2003); both intensive and extensive margin of trade flows adjusts against trade barriers. Hence, following recent approaches of international trade literature, here, the impact of crises on export behavior of the firms will be identified by considering export market participation decision (extensive margin of exports) and export volume decision (intensive margin of exports) separately.

4.1 Impact of Crises on the Extensive Margin of Exports

The empirical trade literature using firm level data has been investigating the determinants of the likelihood of becoming exporter comprehensively. Accordingly, the decision to export is based on the comparison of the current and expected revenues from exporting with the exportation costs. A firm decides to become exporter, $Y_{it} = 1$, if current and expected revenues exceeds the exportation costs,

$$Y_{it} = \begin{cases} 1 & if \ \hat{R}_{it} > f_{it}^{VC} + f^C(1 - Y_{it-1}) \\ 0 & otherwise \end{cases} \tag{1}$$

Here, f_{it}^{VC} denotes the variable production cost and f^C denotes the fixed export costs (sunk-costs). $\hat{R}_{it}$ is the sum of current export revenue and discounted expected values of future income depending on the firms export decision today,

$$\hat{R}_{it} = r_{it} + \delta(E_t[V_{it+1}(.)|Y_{it} = 1] - E_t[V_{it+1}(.)|Y_{it} = 0]) \tag{2}$$

It is common to use the following reduced form equation that is parameterized by firm-specific and macroeconomic variables:

$$Y_{it} = \begin{cases} 1 & if \ \beta X_{it} + \gamma Z_t - f^C(1 - Y_{it-1}) + \varepsilon_{it} > 0 \\ 0 & otherwise \end{cases} \tag{3}$$

Usually, Equation 3 is used for testing the existence of sunk-costs and estimated as dynamic discrete choice model. We will estimate the export propensity of the pre-crisis exporters and pre-crisis non-exporters separately by using the following equation with discrete choice model:

$$Y_{it} = \begin{cases} 1 & if \ \beta X_{it} + \gamma Z_t + \varepsilon_{it} > 0 \\ 0 & otherwise \end{cases} \tag{4}$$

With discrete choice model, it is assumed that actual export behavior can be adequately described by a latent variable model. It assumes that the preference of the firm i for exporting at time t, Y_{it}^*, depends on a set of observable firm characteristics X_{it}, containing efficiency, quality and financial health, unobservable firm characteristics α_i that determine net export benefits and macroeconomic variables Z_t.

$$Y_{it}^* = \alpha_i + \beta X_{it} + \gamma Z_t + \varepsilon_{it} \tag{5}$$

If the latent variable, Y_{it}^*, exceeds threshold level zero, it is assumed that the firm exports. Consequently, by letting $Y_{it} \in \{1,0\}$ to be dummy variable showing firm i's export status at time t, we only observe

$$Y_{it} = \begin{cases} 1, & Y_{it}^* > 0 \\ 0, & Y_{it}^* \leq 0 \end{cases} \tag{6}$$

Therefore, the probability of exporting can be formulated as follows:

$$\Pr(Y_{it} = 1 | X_{it}, \alpha_i) = \Pr(Y_{it}^* > 0 | X_{it}, \alpha_i) = \Phi(X_{it}\beta + \alpha_i) \tag{7}$$

where $\Phi(.)$ denotes the distribution function. Here we choose $\Phi(.)$ to be the cumulative distribution function of the logistic distribution so that the baseline specification can be represented as follows:

$$Y_{it}^* = \beta X_{it} + \alpha_i + \varepsilon_{it} \quad \text{with } \varepsilon_{it} \sim \text{Logistic}$$

$$Y_{it} = \begin{cases} 1, & Y_{it}^* > 0 \\ 0, & Y_{it}^* \leq 0 \end{cases} \tag{8}$$

Some basic and commonly known technical problems arise in discrete choice models within panel data applications of export behavior. The first one is simultaneity problem that arises because exact causality direction is not known (whether exporting causes firm performance or firm performance causes exporting). Following traditional method used in the literature, lagged values for all firm-specific variables are used in order to avoid from simultaneity problem. Another problem is heteroscedasticity arises from unobserved firm heterogeneity, which leads to inefficiency of pooled logit estimator. The estimation of the discrete choice models with unobserved effects carried out either by fixed or random effects. Here, we prefer to use random effects model since firm-specific covariates contain time invariant variables that cannot be estimated with fixed effects. Moreover, with fixed effect model, on average 78 percent of our sample will be lost due to the high persistence of the export status. With the random effects model, it is assumed that unobserved firm heterogeneity is uncorrelated with each explanatory variable and the following specification is used.

$$Y_{it} = \alpha_i + \beta X_{it-1} + \gamma Z_t + \varepsilon_{it} \tag{9}$$

where Y_{it} is a dummy variable showing the export status of the firm i at time t. Y_{it} takes the value of 1 if it exports at time t and 0 otherwise. The vector,X denotes firm specific covariates such as size, partial labour productivity, profitability, technology intensity, non-price competition power, capital intensity, credit constraints. In addition to sector and year dummies, we include sector-year interacted fixed effects to absorb time-varying sector specific shocks. The unobserved firm specific effect, that is assumed uncorrelated with the other explanatory variables, is denoted by α_i and ε_{it} stands for the regression error.

In Table 2, the random effects logit model results for three crisis periods, 1993-1995, 2000-2002 and 2007-2010 are given. The first columns for each crisis period summarizes the determinants of probability of pre-crisis non-exporters to start exporting during corresponding crisis period, and the second column displays the determinants of the probability of pre-crisis exporters to continue exporting during the same period.

We observe that the magnitudes and significances of the estimated coefficients vary across different periods which supports the hypothesis that different types of crises have different impacts on export behavior of export starters and incumbent exporters. Although the magnitude differs across crisis periods, significantly positive relation between size and export propensity is observed in the three different crisis periods. Probability to become exporter for large firms when compared with medium

sized firms was around 2.5 times higher in 1994 crisis, 3 times higher in 2001 crisis and 4.1 times higher in 2008 crisis. Likewise, survival probability of large exporters in export markets was around 1.7 times higher in 1994 crisis, 3 times higher in 2001 crisis and 3.4 times higher in 2008 crisis when compared with medium sized exporters.

Apart from size significance of other firm specific variables also vary across crisis periods. For 1994 crisis, the probability to become exporter is higher for larger, more productive, less credit constrained, more profitable and more quality oriented firms. The interesting result is that the estimated impact of profitability on export propensity for pre-crisis non-exporters is negative. Self-selection of less profitable firms into export markets can be an indication for the risk-averse behavior of Turkish manufacturing firms during 1990s. Efficiency measures (size and productivity) play important role on the exportation probability of the pre-crisis non-exporters, which provide evidence for the self-selection of better performing firms into export markets.

For pre-crisis exporters' decision on continuing export activity during the 1994 crisis period is found to be determined by size, productivity, profitability and non-price competition power of the firms. During 1994 crisis for incumbent exporters

Table 2. Random Effects Logit Model Estimates

Dependent Variable: Dummy Variable for Export Status (1 for firms that have positive foreign sales, 0 otherwise)					
	1994 Crisis (1993-1995)		2001 Crisis (2000-2002)		2008-2009 Crisis (2007-2010)	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
	(1)	(2)	(3)	(4)	(5)	(6)
Micro	0.0948***	0.0981***	0.146***	0.0456***	0.359**	0.109***
	(0.0307)	(0.0523)	(0.0726)	(0.0257)	(0.168)	(0.0494)
Small	0.255***	0.509***	0.425***	0.207***	0.847	0.329***
	(0.0432)	(0.118)	(0.125)	(0.0624)	(0.237)	(0.0828)
Large	2.505***	1.710**	3.062**	2.991***	4.156***	3.417***
	(0.767)	(0.451)	(1.552)	(1.239)	(2.023)	(1.130)
Productivity	1.233**	1.352**	1.193	1.373**	1.036	1.138
	(0.102)	(0.162)	(0.184)	(0.216)	(0.148)	(0.148)
Credit constraint	4.224***	0.974	6.319***	6.376***	3.102*	2.284*
	(1.552)	(0.465)	(4.118)	(3.857)	(1.826)	(1.138)
Capital intensity	1.183**	0.969	1.267**	1.146	1.031	1.043
	(0.0798)	(0.0821)	(0.135)	(0.120)	(0.0838)	(0.0757)
Profitability	0.0370***	2.164*	2.368	1.213***	0.287	0.556
	(0.0126)	(0.07)	(6.241)	(0.039)	(0.572)	(1.358)
Technology intensity	7.740*	5.603	0.578	63.18	2.060	1.376
	(8.879)	(11.54)	(1.301)	(193.3)	(4.282)	(2.062)
Non-price competition	3.081***	2.789**	0.772	11.59***	1.003	4.661***
	(1.106)	(1.354)	(0.532)	(8.173)	(0.708)	(0.315)
Number of observations	5,305	2,948	1,969	5,779	1,786	8,004
Number of Firms	1,967	1,143	750	2,064	645	2,618
Log Likelihood	-2258	-866.4	-782.3	-867.9	-685.9	-1170
Rho	0.696	0.513	0.671	0.736	0.622	0.751

Source: Author's own calculations.

Estimation results for 2001 crisis are given in the columns (3) and (4). The third column gives the estimation results for pre-crisis non-exporters and the fourth column displays results for the pre-crisis exporters. Productivity is not found to be statistically important on the exportation probability. This may imply that the general view about the self-selectivity of more productive firms into export markets lost its validity during the 2001 crisis period. The reason for this becomes obvious when the determinants of the exportation probability are considered. Credit constraint is found to be the main determinant for the propensity to become exporter. The probability of becoming exporter for the firm without credit constraint is nearly 6 times higher than the constrained firms. This is explicitly anticipated since 2001 crisis was a banking sector crisis that led to the credit crunch. Estimation results portray the severity of the credit constraints of the firms. Only those firms that can find external finance for trade costs were able to enter into export markets during 2001 crisis. On the other hand, the probability of continuing exportation during 2001 crisis is found to depend on the size, productivity, credit constraints, profitability and non-price competition of the pre-crisis exporters. This financial turmoil led to self-selection of the better pre-crisis exporters for the survival in export markets. Moreover, after large financial shock, credit constraints of the firms are not only important for the entry dynamics but also important for the survival of the firms in export markets. This provides evidence for the recent arguments about excess sensitivity of the exporters to financial shocks. As it has been first mentioned in Amiti and Weinstein (2011), exporters are more sensitive to financial disturbances. Some of the pre-crisis exporters with poor performance exposed to severe credit rationing which forced them to exit the export markets in 2001 crisis.

In the last two columns, (5) and (6), the estimation results for the recent global crisis are given. The decision to start exporting during the 2008 crisis is influenced mainly by the size and credit constraints of the firms. When the model estimation results for pre-crisis exporters are considered, it is observed that size, credit constraints and non-price competition are found to be positively affecting the probability of continuing to export. Exporters that invested to non-price competition increased their likelihood of overcoming the 2008 global financial crisis.

4.2 Impact of Crises on the Extensive Margin of Exports

We have shown that firm's export decisions change with the crisis. Although discrete choice models inform us about a firm's participation decision in the export market, they say nothing about the decision for the level with which firms engage in this activity. Using the advantages of our data set, we study the determinants of the export volumes under crises using Heckman sample selection corrected model. Sample selection correction is used since previously conducted study by Demirhan-Atabek (2015) concluded that better firms self-select into export markets. In the export spillover literature, Heckman's (1979) sample-selection model is commonly used in the analysis of export decisions[10].

The Heckman self-selection model is a two-equation model. The first equation known as "selection equation" is a latent dependent variable model that specifies the selection mechanism of the sample units

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[10] Some examples are Greenaway et al. (2004) and Kneller and Pisu (2007) for United Kingdom, Buck et al. (2007) for China, Barrios et. al.(2003) for Spain.

(individuals, firms, countries etc). In our case, selection equation identifies the export participation decision:

$$z_i^* = \gamma w_i + u_i \quad with \ u_i \sim N(0,1)$$

$$d_i = \begin{cases} 1 \ if \ z_i^* > 0 \\ 0 \ if \ z_i^* \le 0 \end{cases} \tag{10}$$

where z^* denotes unobserved dependent variable (export propensity of the firms in our case) and w stands for the vector of regressors that determine the participation decision and u is the error term. The dependent variable z^* is unobservable; we just know its sign. Dummy variable, d takes the value of 1 if unobserved variable z^* takes a positive value and 0 otherwise.

The second equation known as the "outcome equation" refers to the export level decision and specified as follows:

$$y_i^* = x_i \beta + v_i, \quad v_i \sim N(0, \sigma^2)$$

$$y_i = \begin{cases} y_i^* = x_i \beta + v_i, & if \ d_i = 1 \\ 0, & if \ d_i = 0 \end{cases} \tag{11}$$

Here, y^* is the variable of interest but it is observable if $z^*>0$, x is the vector of regressors that influence the level of y^* (export level) and v_i represents the error term of the outcome equation. It is assumed that errors of these two equations are correlated, that is to say the unobserved factors affecting export propensity also in charged for the export level decision, and they have a bivariate normal distribution:

$$\begin{pmatrix} u_i \\ v_i \end{pmatrix} \sim N \left[\begin{pmatrix} 0 \\ 0 \end{pmatrix}, \begin{pmatrix} 1 & \rho\sigma \\ \rho\sigma & \sigma^2 \end{pmatrix} \right] \tag{12}$$

where ρ is the correlation coefficient.

The distribution function of y conditional on d=1 and (x,w) is as follows:

$$f(y|d = 1, x, w) = \Pr(y \le \tilde{y}|d = 1, w, x) = \Pr(y \le \tilde{y} \ and \ d = 1|x, w)/\Pr(d = 1|x, w)$$

$$\Pr(y^* \le \tilde{y} \ and \ z^* > 0|x, w)/\Pr(z^* > 0|x, w)$$

$$= \Pr(x_i \beta + v_i \le \tilde{y} \ and \ \gamma w_i + u_i > 0|x, w)/F(\gamma'z)$$

$$= \frac{f((y - \beta'x)/\sigma^2)}{\sigma F(\gamma'z)} \cdot \frac{F(\frac{\rho(y - \beta'x)}{\sigma} + \gamma'z)}{\sqrt{(1 - \rho^2)}} \tag{13}$$

The corresponding conditional expectation of y (export level) is:

$$E(y|d = 1, x, w) = \beta'x + \underbrace{\sigma\rho \frac{f(\gamma'z)}{F(\gamma'z)}}_{Sample \ Selection \ Bias} \tag{14}$$

When $\rho \neq 0$, this implies two decisions are related and the selection bias is significant. Significance of the selection bias makes the standard OLS estimator unbiased. Heckman (1979) proposed two-step estimation method for this type of models. In Heckman's two-step method, the selection equation given in equation 10 is estimated as a probit model using whole sample to determine for each unit the probability of participation. Then, using the estimated coefficients, the second term in equation 14 that corresponds to the sample selection bias is estimated by $f(\hat{\gamma}'z)/F(\hat{\gamma}'z)$. This term is known as the inverse Mill's Ratio (IMR). IMR represents the firm's propensity to become exporter and inclusion of the calculated inverse Mill's Ratio to the equation 11 as an additional regressor will capture selection bias.

In order to correct for the sample selection successfully and obtain credible estimates, at least one variable driving the selection known as an instrument is required. The selected instrument should have high explanatory power only for the selection equation. In our case, lagged export status of the firms is chosen to be the instrument based on previously conducted studies[11].

The application of Heckman selection model in case of unbalanced panel data is similar to the procedure given above. The difference arises in the estimation of the probit. As proposed by Wooldridge (1995), in two-step estimation procedure, first, export market participation is estimated by probit for each year. Using those estimated probit results, the inverse Mills ratios for each firm across years are calculated. Then, the outcome equation with calculated Mills ratios is estimated as pooled OLS regression. Specifically, the selection equation for the export participation decision is as follows:

$$d_{it} = \alpha + \gamma_1 d_{it-1} + \gamma_2 \mathrm{x}_{it-1} + u_{it}, \quad t = 1990, \dots, 2014 \tag{15}$$

where d_{it} stands for dummy variable showing the export status of the firm i at time t. It takes the value of 1 if the firm i at time t has positive foreign sales and 0 otherwise. The vector of firm specific covariates is denoted by x, and contains size, productivity, profitability, technology intensity, non-price competition, capital intensity and credit constraints. Sector dummies are also included.

The outcome equation for the export level decision is specified as follows:

$$y_{it} = \delta + \beta x_{it-1} + \gamma_{94} x_{it-1}.D_{94} + \gamma_{01} x_{it-1}.D_{01} + \gamma_{08} x_{it-1}.D_{08} + \mu z_t + \varphi_1 inv_{it} \tag{16}$$
$$+ \varphi_2 D_{94} inv_{it} + \varphi_3 D_{01} inv_{it} + \varphi_4 D_{08} inv_{it} + v_{it}$$

Here, the dependent variable, y_{it}, is the logarithm of the foreign sales and x_{it} denotes the firm specific covariates- productivity, profitability, technology intensity, non-price competition, capital intensity and credit constraints. Size and sector dummies are also included as firm specific covariates. In addition to time dummies we include industry-year interacted fixed effects for absorbing time-varying industry specific shocks. The estimated inverse Mills ratio obtained from the selection equation is denoted by inv_{it}. In order to investigate the impact of the crises on the extensive margin of exports, interaction terms, $(x_{it-1}.D_{94}, x_{it-1}.D_{01}, x_{it-1}.D_{08})$ are included by assuming crises caused changes in slope coefficients. The significance of the corresponding parameter estimates gives the impact of crises on export volume decision. The Heckman selection corrected regression for export volume is estimated for the 1990-2014 periods. In order to observe how the parameter estimates of the other independent

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[11] Özler et al. (2009) and Demirhan-Atabek (2015) have found that lagged export status has a highly significant impact on the export propensity of the firms.

variables are changing by considering the sample selection bias, we estimate the models with and without inverse Mills Ratios.

Table 3. Regression Models of Firm Export Volumes

	Selection Bias Corrected		Selection Bias NOT Corrected	
	Coefficient	**Std. Error**	**Coefficient.**	**Std. Error**
Micro	-1.51***	0.08	-1.96***	0.08
MicroxD94	0.57**	0.23	0.28	0.22
MicroxD01	-0.06	0.23	-0.34	0.23
MicroxD08	-0.06	0.26	-0.14	0.25
Small	-0.95***	0.03	-1.18***	0.04
SmallxD94	0.12	0.10	-0.01	0.10
SmallxD01	0.05	0.08	-0.03	0.08
SmallxD08	-0.16*	0.09	-0.13	0.09
Large	1.68***	0.04	1.79***	0.04
LargexD94	-0.17*	0.09	-0.03	0.09
LargexD01	-0.01	0.08	0.04	0.09
LargexD08	-0.11	0.08	-0.03	0.08
Productivity	0.72***	0.02	0.67***	0.02
ProductivityxD94	-0.42***	0.05	-0.26***	0.05
ProductivityxD01	-0.102**	0.05	0.02	0.05
ProductivityxD08	-0.08	0.06	-0.02	0.06
Credit Constraint	1.00***	0.07	1.30***	0.08
Credit ConstraintxD94	0.54***	0.19	0.87***	0.19
Credit ConstraintxD01	1.03***	0.17	1.33***	0.18
Credit ConstraintxD08	-0.87***	0.17	-1.02***	0.18
Capital Intensity	0.02	0.01	0.03*	0.01
Capital IntensityxD94	0.04	0.03	0.01	0.04
Capital IntensityxD01	-0.08**	0.03	-0.09***	0.04
Capital IntensityxD08	0.02	0.03	-0.00	0.03
Technology intensity (R&D Exp.)	0.93***	0.24	1.00***	0.24
R&D Exp.xD94	-2.75**	1.16	-2.42**	1.12
R&D Exp.xD01	-0.93	0.96	-1.06	0.93
R&D Exp.xD08	-1.10*	0.57	-0.89	0.60
Non-price competition (NP Comp)	1.02***	0.09	1.31***	0.09
NPCompxD94	-0.67**	0.21	-0.65**	0.22
NPCompxD01	-0.26	0.20	-0.18	0.21
NPCompxD08	0.21	0.21	0.253	0.22
Inverse Mills	-1.51***	0.03		
Inverse MillsxD94	0.14**	0.11		
Inverse MillsxD01	-0,46***	0.14		
Inverse MillsxD08	-0.77***	0.17		
R2	0.982		0.981	
Number of Observations	61809		62851	
Root Mean Square Error	1.85		1.95	
F-statistics	8798		8263	

Given standard errors are clustered at firm-level.

In order to test the presumption made at the beginning, the joint significance of the interaction terms for each variable has been tested. The interaction terms are jointly statistically significant which implies the importance of each variable on the export volume changes with the occurrence of the crisis. This is a strong evidence for the changing export behavior under crisis.

The coefficient of inverse Mills Ratio is highly significant implying the existence of sample selection bias. When the estimation results for the models with and without inverse Mills Ratios are compared, significant changes in the parameter estimates observed. Omitting sample-selection bias leads to overestimated parameter estimates. Moreover, inclusion of the Inverse Mills Ratios reduces the root mean square error. All these can be considered another implication for the significant sample selection bias.

Turning to the firm specific factors, after controlling for the self-selection bias, the level of the exports decision is found to be related with the size, productivity, credit constraint, capital-intensity, profitability, R&D expenses and marketing expenses of the firms.

The impact of firm size on export intensity has mixed results especially for the developing countries. Wagner (1995), because of economies of scale in production, expects a positive impact of firm size on export behavior. However, some recent studies using developing country data found a negative impact of firm size on export behavior. The argument for this negative relation is that large firms tended to be domestic market oriented due to the high profits in the more protected domestic markets. However, our estimation result shows clear positive association between the firm size and export volume; larger firms export more. This result shows that increasing domestic market competition especially with the liberalization of the Turkish economy forced large firms to enter into export markets in order to increase their profits by using scale advantages. When the interaction terms for size and crisis dummies are considered, it is observed that MicroxD94 is positively and LargexD94 is negatively significant. This implies the 1994 crisis created advantageous position in increasing export volume to smaller firms.

More productive and less credit constrained firms can export more. This is expected since higher export sales is correlated with the number of markets served and each market entry requires fixed entry costs. Therefore, large, more productive and less credit constrained firms can raise fixed export costs so that they can enter more markets and consequently increase their export volumes.

Positive R&D and marketing expenses is as expected since quality production is the key factor for the survival and the success in export markets. It is a well-documented fact that improvement in non-price competition plays key role in the sustainability of the export market share.

As mentioned before, interaction terms of the explanatory variables with the crisis dummies enable to explore the impact of crises on export behavior of the firms. Significance of the interaction terms imply that with the occurrence of the crises changes the export behavior of Turkish manufacturing firms.

For the 1994 crisis, same set of firm-specific variables are found to be statistically significant determinants of export volume. However, their relative importance varies. More precisely, according to the estimation results, while the importance of productivity and quality measures declined, importance of credit constraint became more pronounced. This implies that firms preferred to offset profitability losses by exports.

For the 2001 crisis, it is observed that the importance of credit constraints increased relative to the general pattern. This is anticipated, since 2001 crisis is mainly characterized by a severe credit crunch. Negative estimated coefficient for the interaction term of capital intensity and 2001 crisis dummy shows the comparatively disadvantageous position of capital-intensive firms. This arose due to the fact that during 2001 crisis, unemployment rates increased sharply that led to considerable declines in the cost of labor and caused comparative disadvantage for capital intensive firms.

For the 2008 crisis, a different pattern is observed. According to the estimation results, the importance of credit constraints and technology intensity declined. On the other hand, the impact of productivity and non-price competition remains same as in the general pattern. Firms that were more productive and had higher non-price competition power exported more during the 2008 crisis.

Estimated coefficients for the inverse Mills ratios suggest several important implications. The interaction terms, invxD94, invxD01 and invxD08, display the importance of selection-bias. In other words, the impact of unobservable firm-specific factors are substantial during the crises. The estimated coefficient invxD94 is found to be positive and statistically significant whereas invxD01 and invxD08 are negatively significant. These imply that during the 1994 crisis, selection bias was smaller, but it increased in 2001 and 2008.

5   Conclusion

We explored the impact of three different economic crises on both the extensive and intensive margins regarding the Turkish exports. We modeled both export propensity and export volumes of the firms. Our results show that export behavior of the firms varies under different types of crisis. In the 1994 crisis which characterized by high devaluation and contracted domestic demand, caused exports boom through increasing export propensity (extensive margin). Although still better firms self-select into export markets large devaluation encourages smaller and better performing firms' foreign market entrance. For the case of 2001 crisis which is characterized by contraction of credit supply, the importance of external finance for firm's export decisions become obvious. Credit constraints of the firms not only affect the export participation decision but also it affects survival of exporters in international markets. We observe that the self-selection of exporters becomes invalid in the existence of credit crunch; only those firms that can find sufficient external finance for covering the trade costs are able to enter into export markets. During the periods of economic turmoil characterized by credit crunch accompanied by severe foreign demand contraction like in the case of the recent global financial crisis, in addition to credit constraints, non-price competition plays important role on the exportation decision. Investing quality production not only ease export market entry but also increases firm's survival probability in export markets.

These results have policy implications for promoting exports. Better (consistent) exporters tend to be larger, less liquidity constrained, and more productive firms. However, global crisis where an exporting country's foreign markets contract may strain even those better performing firms. In case of a domestic contraction without a credit crunch, export promotion policies may be targeted to increase the number of exporters (i.e. smaller firms). When there is a contraction with a credit crunch, larger, more productive players could be given priority to help increase their penetration in their export markets. In order to hold export sector ready for global shocks, awareness for the importance of non-price competition has to be created. Firms have to be aware of the fact that a lower price is not the only way of competing and they can be encouraged to strengthen competition power by investing to quality production, customer satisfaction and after sale services.

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