EXPORT BEHAVIOR OF THE TURKISH MANUFACTURING FIRMS, 1989-2010 PERIOD

A THESIS SUBMITTED TO
THE GRADUATE SCHOOL OF SOCIAL SCIENCES
OF
MIDDLE EAST TECHNICAL UNIVERSITY

BY

ASLIHAN ATABEK DEMİRHAN

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR
THE DEGREE OF DOCTOR OF PHILOSOPHY
IN
THE DEPARTMENT OF ECONOMICS

FEBRUARY 2013

Approval of the Graduate School of Social Sciences

_____

Prof. Dr. Meliha Altunışık
Director

I certify that this thesis satisfies all the requirements as a thesis for the degree of Doctor of Philosophy.

_____

Prof. Dr. Erdal Özmen
Head of Department

This is to certify that we have read this thesis and that in our opinion it is fully adequate, in scope and quality, as a thesis for the degree of Doctor of Philosophy.

_____

Assoc. Prof. Dr. Hakan Ercan
Supervisor

Examining Committee Members:

Assoc. Prof. Dr. Selin Sayek Böke	(Bilkent U., ECON)	_____
Assoc. Prof. Dr. Hakan Ercan	(METU, ECON)	_____
Prof. Dr. Erkan Erdil	(METU, ECON)	_____
Prof. Dr. Ramazan Sarı	(METU, BA)	_____
Assoc. Prof. Dr. Meltem Dayıoğlu Tayfur	(METU, ECON)	_____

I hereby declare that all information in this document has been obtained and presented in accordance with academic rules and ethical conduct. I also declare that, as required by these rules and conduct, I have fully cited and referenced all materials and results that are not original to this work.

Name, Last Name: Aslıhan Atabek Demirhan

Signature :

ABSTRACT

EXPORT BEHAVIOR OF TURKISH MANUFACTURING FIRMS, 1989-2010 PERIOD

DEMİRHAN ATABEK, ASLIHAN
Ph.D., Department of Economics
Supervisor: Assoc. Professor Dr. Hakan Ercan

February 2013, 216 pages

Using firm-level data of manufacturing sector during the period 1989-2010, this thesis explored the export behavior of firms in Turkey. Up to date, Turkey's export performance has been analyzed from macro perspective extensively. However, far too little attention has been paid to firm-level analysis contrary to ongoing and growing empirical literature. The preliminary analysis revealed the superiority of exporting firms. Both self-selection and learning-by-exporting are found to be valid explanation for the source of this observed export premium. Dynamic discrete choice model results provide supportive evidences for the existence of sunk-costs. Besides, it is observed that sunk-costs varied during the crises. Sunk-costs not only shape export decision but also affect timing decision. The exit and entry dynamics of the firms has been studied using duration analysis. Results showed self-selection of less profitable firms into export markets and importance of non-price competition for the survival of exporters. Impact of crises on export behavior has been examined by regarding extensive and intensive margins of exports separately. The findings implied

that for 1994 crisis increase in extensive margins, for the case of 2001 crisis increase in intensive margin and for 2008 crisis decline both in extensive and intensive margins of exports dominated. This thesis makes several noteworthy contributions to the existing literature. First, it contributed to the ongoing and growing empirical literature using Turkish data. Secondly, unlike, existing studies that investigate single feature of the export behavior, in this thesis, using different approaches the issue has been analyzed extensively. Moreover, using advantage of the data set and Turkish economy, the impact of different types of crisis on export behavior has been analyzed and contributed to the literature that studies the impact of shocks on export behavior.

Keywords: Export behavior, firm heterogeneity, firm-level analysis, microeconometrics, Turkey.

ÖZ

1989-2010 YILLARI ARASI TÜRK İMALAT SANAYİ FİRMALARININ İHRACAT DAVRANIŞI:

Demirhan Atabek, Aslıhan
Doktora, İktisat Bölümü
Tez Yöneticisi: Doç. Dr. Hakan Ercan

Şubat 2013, 216 sayfa

Bu tez, Türk imalat sektöründe faaliyet gösteren firmaların 1989-2010 dönemine ait verilerini kullanarak ihracat davranışlarını incelemektedir. Bu zamana kadar Türkiye'nin ihracat performansı makro-bazda birçok çalışmaya konu olmuştur. Ancak, son dönemde gelişmekte olan literatürün aksine, firma-bazlı analize yeterli önem gösterilmemiştir. Ön inceleme sonuçları ihracatçı firmaların üstünlüğüne işaret etmektedir. Türk imalat firmaları için, kendi kendine seçim (self-selection) ve ihracat yaparak öğrenme (learning-by-exporting) hipotezlerinin gözlenen ihracat priminin kaynağını açıklamada geçerli olduğu gözlenmiştir. Devingen kesitli seçim model sonuçları battı maliyetlerinin varlığını desteklemektedir. Buna ek olarak, battı maliyetlerin krizlerle birlikte değiştiği gözlenmiştir. Battı maliyetlerin varlığı firmaların ihracat piyasalarına giriş zamanlama kararlarını da etkileyebilmektedir. Süre modelleri kullanılarak firmaların ihracat piyasalarına giriş-çıkış devingenleri incelenmiştir. İhracat piyasasına girişte iç piyasada daha az

kar elde eden firmaların kendi kendilerini seçtikleri gözlenmiştir. Ayrıca, kalite rekabetinin ihracatçı olmak için ön şart olmasa dahi uluslararası piyasalarda sağ kalım için gerekli olduğu sonucuna ulaşılmıştır. Krizlerin ihracat davranışları üzerindeki etkisi yoğunluk (intensive) ve yayılma (extensive) ticaret marjları çerçevesinde incelenmiştir. Tahmin sonuçları, 1994 ve 2001 krizlerinde, toplam ihracatta gözlenen artışlarda sırasıyla yayılma ve yoğunluk ticaret marjlarındaki artışların etkili olduğunu göstermiştir. 2008 krizi ile birlikte ihracatta gözlenen belirgin düşüşün her iki ticaret marjında gözlenen düşüşten kaynaklandığı sonucuna varılmıştır. Bu tezin mevcut yazına önemli birkaç katkısı olmuştur. İlk olarak gittikçe gelişen ve büyüyen yazına Türkiye verisi kullanarak katkıda bulunmuştur. Daha sonra, önceki diğer çalışmalarda yapılanın aksine, bu tezde ihracat davranışları farklı yönleri ile ele alınmıştır. Ayrıca, veri setinin ve Türkiye ekonomisinin avantajı kullanılarak farklı türdeki krizlerin ihracat davranışları üzerindeki etkileri incelenmiş ve şokların ihracat davranışları üzerindeki etkisini konu alan yazına katkı sağlamıştır.

Anahtar Kelimeler: İhracat davranışları, firma heterojenliği, firma düzeyinde analiz, mikroekonometri, Türkiye.

To my special family who is always with me spiritually in this long and arduous process.

ACKNOWLEDGMENTS

Four challenging years working on this thesis has been a rewarding experience for my academic and personal development. During these long and arduous years, I have cooperated with a few precious people who have important roles in the completion of my thesis. It is pleasure for me to express my gratitude to all of them.

I would like to express my sincere appreciation to my supervisor Associate Professor Dr. Hakan Ercan for his guidance, advice, criticism, encouragements and insight throughout my thesis. Besides, I would like to thank to Dr. Semih Tümen for his advices.

I would like to convey special thanks to Prof. Dr. Erkan Erdil, Prof. Dr. Ramazan Sarı, Assoc. Prof. Dr. Selin Sayek Böke and Assoc. Prof. Dr. Meltem Dayıoğlu Tayfur for their valuable contributions to my thesis.

I am obliged to many of my friends (especially Defne, Evren and Saygın) and my fellow Nebile who supported me as being good listeners.

I would like to pour out my thanks to my dearest daughter, Ayda, and son, Adal, for their maturity and understanding when I could not spare time for them. If they were not there, most probably I would finalize this thesis in shorter period but I am sure that I would know much less about life, love and happiness. I am thankful for their existence that brightens the mornings of study nights that are tiring and wakeful. Besides and most importantly, my family (my understanding husband, devoted parents, Erol and Besime Atabek and also my elder sister Asena Atabek) deserve my sincere gratitude for believing in me and offering me unconditional support and encouragement. This thesis would not have been possible without their support and to them I dedicate it.

Finally, thanks to myself for insisting and succeeding to complete PhD with two little kids in addition to business and marriage life by preferring to resist in the face of difficulties.

TABLE OF CONTENTS

PLAGIARISM iii
ABSTRACT iv
ÖZ vi
DEDICATION viii
ACKNOWLEGMENTS ix
TABLE OF CONTENTS x
LIST OF TABLES xiii
LIST OF FIGURES xv
CHAPTER

1. INTRODUCTION 1

2. LITERATURE REVIEW 12

2.1 Theoretical Framework 13
2.1.1 Traditional and New Trade Theories 13
2.1.2 The “New” New Trade Theory 17
2.2 Empirical Framework 22
2.3 Conclusion 29

3. DATA SET 30

3.1 Comparison of Existing Data Sources 30
3.2 CBRT Company Accounts Data Set 31
3.3 DESCRIPTIVE STATISTICS 36
3.3.1 Firm Characteristics of Turkish Manufacturing Sector 36
3.3.2 Structure of Production and Growth in Production 39
3.3.3 Structure of Exports, Entry and Exit Behavior, and Growth in Exports 43
3.3.4 Choice of Market and Market Switching 48
3.4 Conclusion 50

4. VARIABLES 52

4.1 Dependent Variables 52

4.2 Independent Variables 53
4.2.1 Efficiency Measures 53
4.2.2 Quality Measures 54
4.2.3 Financial Health Measures 57
4.3 Macroeconomic Variables 58
4.3.1 Dummy Variables 60
5. EXPORT BEHAVIOR OF THE TURKISH MANUFACTURING FIRMS 63
5.1 Export Premium 64
5.1.1 Descriptive Statistics 65
5.1.2 Export Premia 68
5.2 SELF-SELECTION HYPOTHESIS 72
5.3 Testing Learning-by-Exporting 74
5.3.1 Using PSM and DID in Learning-by-Exporting Assessment 75
5.3.2 Propensity Score Matching Estimates 79
5.4 Testing Existence of Sunk-Costs 84
5.5 Export Market Entry and Exit Dynamics 92
5.5.1 Analyzing the data 95
5.5.2 Empirical Approach in Survival Analysis 97
5.5.3 Explanatory Variables 100
5.5.4 Empirical Results for Entrance into Export Markets 103
5.5.5 Empirical Results for the Survival in Export Markets 110
5.6 Summary of the Results 117
6. EXPORT BEHAVIOR OF TURKISH MANUFACTURING FIRMS UNDER CRISES 122
6.1 Defining, Measuring and Identifying Crises in Turkish Economy.. 124
6.2 Three Recent Significant Crises of Turkey 128
6.2.1 1994 Economic Crisis 129
6.2.2 2001 Crisis 132
6.2.3 2008-2009 Crisis 134
6.3 Descriptive Analysis 137

6.4 Econometric Approach 144
6.4.1 Impact of Crises on Extensive Margin of Export 144
6.4.2 Impact of Crises on Extensive Margin of Export 155
6.4.3 Assessment the Impact of Crises on Extensive and Intensive Margins of Exports 168
7. CONCLUSION 172
REFERENCES 180
APPENDICES
A. Manufacturing Sectors In Turkey, Nace Rev 1.1 192
B. Joint Significance Test Results 193
C. Sample Averages for the Independent Variables 194
D. Curriculum Vitae 195
E. Turkish Summary 198
F. Tez Fotokopisi İzin Formu 216

LIST OF TABLES

TABLES

Table 1.1 Exports by Main Sectors* (Billions of US$) 2

Table 3.1 Representativeness of the Sample: 2003-2008 34

Table 3.2 Regional Dispersion of Manufacturing Firms 38

Table 3.3 Sectoral Distribution of Manufacturing Firms (%) 40

Table 3.4 Sectoral Distribution of Manufacturing Real Net Sales 41

Table 3.5 Annual Percentage Change of Real Net Sales during The Crises 42

Table 3.6 Sectoral Distribution of Exporters (In terms of number of firms) 44

Table 3.7 Sectoral Distribution of Exports (In terms of foreign sales) 45

Table 3.8 Export Intensity: Percentage of Exporters in Each Sector 46

Table 3.9 Export Intensity: Percentage of Nominal Output that is Exported 47

Table 3.10 Distributions of Firms by Market Served (Mean %) 48

Table 3.11 Market Transition, TURKEY 50

Table 4.1 Manufacturing Sector Export Structure (percentage share) 60

Table 4.2 Variables and Their Definitions 61

Table 5.1 Comparison Means of Performance Measures for Exporters and Non-Exporters 68

Table 5.2 Fixed Effect Panel Data Regression of Firm Performance Measures on Export Status 70
Table 5.3 Self Selection: Pre-entry Export Premium in Levels 73
Table 5.4 Trade-Offs in Terms of Bias and Efficiency 79
Table 5.5 Propensity Score Model Coefficient Estimates 80
Table 5.6 Assessing the Matching Quality: Balancing Property of the Pre-Entry Covariates 81
Table 5.7 Estimated Average Treatment Effect of Export Starters 82
Table 5.8 Testing Existence of Sunk-cost: Dynamic Logit Estimation Results 87
Table 5.9 Number of Firms Used in the Analysis 96
Table 5.10 Descriptive statistics for the duration of becoming exporters 103
Table 5.11 Estimation Results for the Export Market Entry Time 107
Table 5.12 Description of the Survival-Time Data 111
Table 5.13 Estimation Results for the Export Market Survival of New Exporters 114
Table 6.1Transition Across Markets 137
Table 6.2 Transition Rate across Markets 138
Table 6.3 Transition Rates across Markets by Size 139
Table 6.4 Transition Rates across Markets by Technological Intensity .. 141
Table 6.5 Random Effects Logit Model Estimates 149
Table 6.6 Regression Models of Firm Export Volume 159

LIST OF FIGURES

FIGURES

Figure 3.1 Number of manufacturing firms used in the analysis 33

Figure 3.2 GDP and Net Sales 35

Figure 3.3 Annual Growth Rates (%)..... 35

Figure 3.4 Exports (Billions US $) 36

Figure 3.5 Export Annual Growth Rates (%) 36

Figure 3.6 Size Distribution of Firms*..... 37

Figure 3.7 Size Distribution of Firms Across Sectors* 37

Figure 3.8 Legal Status of Manufacturing Firms 39

Figure 3.9 Average Real Net Sales 49

Figure 5.1 Size by Total Employment..... 65

Figure 5.2 Productivity* 65

Figure 5.3 Profitability**..... 65

Figure 5.4 Technology Usage..... 65

Figure 5.5 Marketing Expenses 66

Figure 5.6 Capital Intensity*..... 66

Figure 5.7 Credit Constraints..... 66

Figure 5.8 Liquidity..... 66

Figure 5.9 Kaplan-Meier Survival Estimate For the Firms To Become Exporter..... 104

Figure 5.10 Survival and Size..... 105

Figure 5.11 Survival and Productivity 105
Figure 5.12 Survival and Profitability 105
Figure 5.13 Survival and Credit Constraint 105
Figure 5.14 Survival and Liquidity 105
Figure 5.15 Survival and R&D Intensity 105
Figure 5.16 Survival and Capital Intensity 106
Figure 5.17 Survival and Marketing Expenses 106
Figure 5.18 Kaplan-Meier Survival Estimate In The Export Markets 111
Figure 5.19 Survival in Export Markets and Size 112
Figure 5.20 Survival in Export Markets and Productivity 112
Figure 5.21 Survival in Export Markets and Profitability 112
Figure 5.22 Survival in Export Markets and Credit Constraint 112
Figure 5.23 Survival in Export Markets and Liquidity 113
Figure 5.24 Survival in Export Markets and Capital Intensity 113
Figure 5.25 Survival in Export Markets and R&D Expenses 113
Figure 5.26 Survival in Export Markets and Marketing Expenses 113
Figure 6.1 Real Production Growth, Monthly Inflation and Exchange Market Pressure Indices 126
Figure 6.2 Real Sector, Inflation and Exchange Rate Crises in Turkish Economy for 1989-2010 Period 127
Figure 6.3 Annual GDP (Billions US $) and Annual GDP Growth Rate (%), 1990-2010 130
Figure 6.4 Exports (Billions US $) and Annual Growth Rate (%), 1990-2010 131
Figure 6.5 Real Exchange Rate (1987=100) 134

Figure 6.6 Distribution of The Firms According to the Exporter Type ... 142
Figure 6.7 Foreign Sale Intensity of Continuous Exporters and Export Starters ... 143
Figure 6.8 Estimated Export Volumes for Different Size Groups ... 166
Figure 6.9 Percentage Changes During Crises Relative to General Pattern ... 166
Figure 6.10 Estimated Average Export Volume for Technological Intense Sector Groups ... 167
Figure 6.11 Percentage Changes During Crises Relative to General Pattern ... 167
Figure 6.12 Calculated Average Intensive Margins of Export ... 168
Figure 6.13 Impact of Crises on Intensive Margins of Exports ... 168
Figure 6.14 Impact of 1994 Crisis on Export Behavior ... 169
Figure 6.15 Impact of 2001 crisis on Export Behavior ... 170
Figure 6.16 Impact of 2008 crisis on Export Behavior ... 171

CHAPTER 1
INTRODUCTION

INTRODUCTION

This thesis investigates firm-level export behavior of the Turkish manufacturing firms for the 1989-2010 periods. More precisely, we begin our analysis by comparing exporters and non exporters in different selected performance measures via simple descriptive and regression analysis. This preliminary analysis provides answer to the question what are the characteristics of exporting firms in Turkey. Then self-selection and learning by exporting hypotheses are tested. The analysis is extended by testing existence of sunk-cost via dynamic discrete choice model. This approach also provides answer to the question what are the factors that derive the export performance of Turkish manufacturing firms. Then, in order to reveal the determinants of the waiting time of becoming exporter and survival in export markets, duration analysis is employed. Lastly, we investigate how Turkish exporting firms react to frequent shocks.

This thesis combines answers to different questions in order to come up with a coherent story. To do so, in line with the heterogeneous firm-level trade literature, a wide range of existing empirical estimation techniques on the Central Bank of the Republic of Turkey (CBRT) Company Accounts dataset is employed. This unique data set is one of the largest and the most comprehensive firm level database for Turkey. For the period 1989-2010, balance sheets, income statements and firm specific information such as employment, establishment date, company town and legal status are collected from financial and non-financial firms on an annual basis. In this thesis, we only considered manufacturing firms due to the fact that manufacturing goods constitute large portion of Turkey's export.

Using Turkish data for investigating firm-level export behavior has several advantages. First, investigating Turkish manufacturing firms' export behavior will provide a good reference for a typical emerging economy.

Secondly, its relatively young population and high labor force growth makes Turkey one of the toughest competitor in European Union (EU) market. Therefore, investigating firm-level export performance over time will provide several tips for mitigating adverse effects of low cost tough competitors for other countries that export to EU. Finally, Turkey's crisis experiences enable to investigate the impact of different types of crisis on export behavior.

Turkish economy's export orientation has been started in the early 1980's as in many developing countries. Known as "24 January Decisions", an economic stabilization program implemented in 1980 was the starting point of trade liberalization and market-oriented economic reforms in Turkey. In this program, exports subsidies and export-led growth policies were adopted in place of import substitution policies. Since then integration to global markets and export orientation has been policy anchors for all Turkish governments. In just a few years, positive effects of these policies were observed on Turkish exports. The exports reached to USD 12.96 billion in 1990 from USD 2.91 billion in 1980. In addition to notable performance, structural transformation in exports was remarkable. The share of manufactured goods in total exports of Turkey increased from 36 percent in 1980 to 80 percent in 1990 and 93 percent in 2010.

Table 1.1 Exports by Main Sectors* (Billions of US$)

	Agriculture	Mining	Manufacturing	Total
1950	0.245	0.150	0.004	0.263
1960	0.244	0.200	0.580	0.321
1970	0.441	0.390	0.109	0.589
1980	1.672	0.191	1.047	2.910
1990	2.249	0.326	10.349	12.959
2000	1.659	0.400	25.518	27.775
2010	4.935	2.687	105.467	113.883

Source: SPO, TURKSTAT
* Based on ISIC-REV3 classification from 1989 onwards.

Turkey's export performance was investigated in many studies from macroeconomic perspectives. Some of these studies considered explaining the driving factors of Turkey's export booms. Arslan and Wijnberg (1993) Barlow and Şenses (1995) focused on 1980-1987 periods and they

concluded that the adopted policies played important role in the experienced export boom in this period. Aysan and Hacihasanoglu (2007) investigated the export boom in the 2000s and concluded that productivity is the main driving force for the Turkey's export growth after 2000. A set of studies investigated the relationship between export growth and economic growth. Bahmani-Oskooee and Domac (1995), Özmen and Furtun (1998) and Yiğidim and Köse (1997) are among the leading ones and they obtained mixed results about the validity of the export-led growth hypothesis. The former found evidences for the export-led growth hypothesis, whereas, the others rejected the validity of this hypothesis. There are also considerable numbers of studies that investigate the role of exchange rate on trade. Some of studies[1] concluded that real exchange rate is the leading actor for the export performance of Turkey whereas others[2] could not find any evidence for this.

For the last couple of decades, both in empirical and in theoretical trade literature, the interest has shifted from macro to micro-level investigation of the export performance. The main reason for this shift is the recent availability of micro-level data sets. Contrary to growing and enriching empirical literature on firm-level export behavior, the applications for Turkey were fairly limited. Predominantly, the learning-by-exporting hypothesis has been investigated using Turkish firm-level data (Yasar and Rejesus, 2005; Yasar et al., 2007, Aldan and Günay, 2008; Kılıçaslan and Erdoğan, 2012; Maggioni, 2012). Apart from these, Yasar, Nelson and Rejesus (2003) investigatedthe productivity effects of firms at different export status and Özler et al. (2009) examined export market participation decision of Turkish manufacturing plants for 1990-2001 periods within the sunk-cost framework.

Despite the importance of exports for Turkish economy, limited number of firm-level analysis constitutes the main motivation for this

[1] See Arslan and van Wijnbergen (1993), Barlow and Şenses (1995), Uygur (1997), Saygılı, Şahinbeyoğlu and Ulaşan (1998), Şahinbeyoğlu and Ulaşan (1999), Özatay (2000), Akbostancı (2002).

[2] See Zengin and Terzi (1995, 1999), Atabek and Çevik (2001), Sivri and Usta (2001), Aydın, Çıplak and Yücel (2004).

thesis. Moreover, conflicting results emerged from macro-level studies increase the significance of firm-level analysis.

The first empirical exercise is based on the pioneering empirical study of Bernard and Jensen (1995) in which the aim is to investigate the performance differences of exporters and non-exporters. Using simple regression equation export premia is calculated for each chosen firm performance (size, productivity, profitability, capital-intensity, R&D intensity, non-price competitiveness, credit constraint and liquidity). Our main finding from this empirical exercise is that exporters are better than non-exporters. To be more specific Turkish manufacturing sector exporters are found to be larger, more productive, more capital-intensive, more quality oriented (higher R&D, marketing and advertisement expenditures), more profitable, more liquid and less credit constrained. Our findings are consistent with the previously obtained and commonly accepted views about the superiority of exporters (For a detailed literature review, see Wagner, 2007).

Showing the superiority of the exporters leads us to investigate the validity of two leading hypothesis about the sources of this observed export premium. Seminal papers by Bernard and Jensen (1995) and Clerides et al. (1998) are first in analyzing two alternatives, self-selection hypothesis and learning-by-exporting hypothesis. According to self-selection hypothesis, superior firms self-select to be in the export market and thus causality runs from performance to exports. On the other hand, learning-by-exporting asserts that international markets are more competitive and challenging which forces exporting firms to improve faster, so that exporting makes firms better. We test self-selection using Wagner's (2007) recommendation by assessing the pre-export performance difference of export starters and non-exporters. Learning-by-exporting hypothesis is tested via Propensity Score Matching Difference-in-Difference (PSM-DID) approach. Our findings reveal that for Turkish manufacturing exporters both self-selection and learning-by-exporting hypotheses are valid. More precisely, larger, more productive and more capital-intensive Turkish manufacturing firms self-select into export markets. Moreover, engaging export activity improves the

size, productivity, credit conditions and non-price competitiveness of the export starters. Significant learning-effect for Turkish manufacturing sector provides supportive evidence for the view that learning-effect is important especially for the developing countries. Contrary to previously conducted studies for developed countries[3] in which no statistically significant learning-effect was found, recent studies for developing countries[4] concluded on the behalf of significant learning-effect.

Predominance of self-selection hypothesis brings the existence of sunk export market entry costs. The literature extended by considering the existence of sunk-costs. Following the literature, given that Turkish manufacturing exporters are self-selected into international markets, existence of the sunk-costs is tested. Roberts and Tybout (1997) proposed dynamic discrete choice model for testing the existence of sunk cost by referring to the hysteresis trade literature. According to the hysteresis literature, existence of sunk entry costs in the export markets produces hysteresis in trade flows. Following the Roberts and Tybout approach, importance of the sunk-costs on the export market participation decision of the Turkish manufacturing firms is investigated for the period 1990-2010 via dynamic discrete choice model. The estimation result reveals the importance of sunk-costs. Moreover, it is concluded that the benefits of past export experience does not depreciate fully immediately after the exit, its effect diminishes in the following year of the exit and perishes after three years. The existence of sunk-costs for the case of Turkey was first studied by Özler et al. (2010) using different dataset coming from TURKSTAT for the period 1990-2001. They found high sunk-costs of entry into export markets and moreover full history of the exporting matters for the current export decision. Consistent with our findings they concluded that past export market experience depreciates rapidly. Different from Özler et al. (2009),

[3] For example, Bernard and Jensen (1999) for U.S., Clerides et al. (1998) for Colombia and Morocco, Aw et al. (2000) for Korea and Arnold and Hussinger (2004) for Germany.

[4] See Kraay (1994) for China, Fernandes and Isgut (2007) for Colombia, Bigsten et al. (2004) for sub-African countries, Blalock and Gertler (2004) for Indonesia, Yasar and Rejesus (2005) for Turkey, DeLocker (2007) for Slovenia, Yasar et al. (2007) for Turkey, Albornoz and Ercolani (2007) for Argentina, Aldan and Günay (2008) for Turkey, Maggioni (2012) for Turkey.

using the advantage of our dataset's lengthy coverage, we include interaction terms of the crisis dummies with lagged export status $\tilde{Y}_{it-1}$ in order to investigate the variation of sunk-cost during the crisis. Accordingly, we found that occurrence of the crisis affects the sunk-costs. With occurrence of the 1994 crisis, sunk-costs declined whereas with the 2008 crisis, sunk-costs increased; for 2001 crisis, no statistically significant change in the sunk-cost observed.

Our findings for the existence of sunk-costs for entry into export markets and their variation with the occurrence of the crises lead us to investigate the entry-exit dynamics of the Turkish manufacturing firms. Hysteresis literature shows that presence of sunk-costs forces some exporters to absorb adverse effects of tough periods and remains in the export markets in order to avoid paying re-entry costs. On the other hand, non-exporters have opportunities to postpone export market entrance against unfavourable economic developments. Within this framework, we suggest that existence of sunk-costs not only shape the export decision of the firms but also affect the entry-exit timing decision of the firms. Using survival analysis, both the duration to become exporter and the survival of the new exporters is studied. Crisis dummies are included in the duration models in order to investigate explicitly the impact of the crises on export market entry-exit dynamics. Survival analysis findings also give supportive evidences for the self-selectivity of the exporters and importance of sunk-costs. It is concluded that the waiting time for larger, more productive, more capital intensive, less credit constrained and less profitable firms producing low-tech products is shorter. It is found that survival probability of larger, more productive, less credit constrained, more profitable and more quality oriented firms is higher. Moreover, estimation results show that while occurrence of 1994 crisis encourages some Turkish manufacturing firms to enter into export markets, 2008 global financial crisis led to postponding export market entry of some firms. Moreover, 2008 crisis increased the hazard rate of new exporters which implies occurrence of 2008 crisis adversely affected the export market survival of Turkish manufacturing firms.

Finally, the export behavior under different crises is investigated by considering extensive and intensive margin of exports separately based on Chaney (2008). Chaney (2008) showed that in the Melitz model framework, in response to changing trade barriers, there is an additional adjustment mechanism coming from extensive margin of trade. Using this additional adjustment mechanism, some studies such as Blalock and Roy (2007) try to explain unresponsiveness of trade to large devaluations especially after crisis and others (Amiti and Weinstein, 2009; Bernard et al., 2009; Bricongne et al., 2010; Behrens et al., 2010) investigate the impact of financial shocks on export behavior.

We investigate the impact of the crises on extensive margin by employing Blalock and Roy (2007) approach. The probability of starting to export in the crisis periods for the pre-crisis non-exporters and the probability of continuing to export in the crisis periods for the pre-crisis exporters are modeled separately via discrete choice models. The main finding of these estimation exercises is that the export behavior of Turkish manufacturing firms displays differences across different crises. The estimation results provide quantification of the existing arguments about the possible impact of the crisis on exports. For the 1994 crisis, it is observed that general export behavior pattern was preserved. Similar to general pattern, the probability of becoming exporter for better firms (larger, more productive, less credit-constrained and more quality oriented firms) is higher. On the other hand, estimation results for the 2001 crisis show the severity of the credit crunch. Only those large firms that find external financial source can become exporter. With the global financial crisis that occurred in 2008, “less profitable firms” self-select into export markets.

The intensive margin of export is modeled with Heckman selection bias correction given that better firms self-select into export markets. For the selection equation of the Heckman selection model, the lagged export status is used as an instrument since it is found that previous export status plays significant role on the current export decision that is attributed to the presence of sunk-costs. In order to capture the impact of crises, a general model is estimated with the assumption that occurrences of crises affects

the slope and intercept coefficients of the independent variables. By inclusion of interaction terms of the independent variables with three different crisis dummie the general model is estimated. Testing the significance of the interaction terms provides strong evidence for the changing export behavior under crisis.

The main findings of this empirical exercise can be summarized as follows. First and foremost estimation results showed the importance of selection bias correction. Comparison of the models with and without selection bias correction showed that omitting self-selection of the exporters' leads to overestimated parameters. After controlling for the self-selectivity bias, the level of the exports decision is found to be related with the sector, size, productivity, credit constraint, capital-intensity, profitability, liquidity, R&D expenses and non-price competitiveness (marketing expenses) of the firms. Coefficients for interaction terms of sector dummies with the crisis dummies revealed that in 1994 crisis, export volumes affected adversely for the firms that were not operating in low tech sectors and with the occurrence of 2001 and 2008 crises, medium-low and medium-high tech firms' export volume increased. When the interaction terms for size and crisis dummies are considered, it is observed that occurrence of 1994 crisis positively affected the export volume of the micro firms and the occurrence of 2001 crisis increased the export volume of the large firms. On the other hand, 2008 crisis adversely affected the export volume of small firms.

Estimation results show that higher capital intensity operation is unlikely to give the Turkish manufacturing firms comparative advantage and negatively significant coefficient is estimated for the capital intensity. On the other hand, for R&D and marketing variables positive and highly significant coefficients are estimated which implies that non-price competiveness or in other words quality is an important determinant for the export volume of the Turkish manufacturing firms.

Our findings, negative impact of capital-intensity and technological sophistication together with the importance of quality, imply specific strategy for improving Turkey's export performance. Contrary to existing general view, instead of shifting from low-tech sector of specialization to

high-tech sector, Turkey should keep its specialization in traditional sectors by upgrading the quality of its low-tech and labor intensive products. This specific strategy will help to cope with increasing competition pressure coming from other low-cost countries and further improve the export performance

Overall evaluation of estimation results within real exchange rate-export behavior relation reveals that contrary to general arguments the positive impact of favorable exchange rate changes is fairly limited. It is observed that real exchange rate only affects the decision of non-exporters in which appreciation generates export market entry intensive for the firms that are large, productive, less credit constrained. However, no significant impact of exchange rate is observed on the incumbent exporters' decisions. Neither survival nor the export sales are found to be affected by real exchange rate movements. Considering real exchange rate as a measure for price competitiveness, our results show that price competitiveness had lost its importance for Turkish exporters. They are now aware the importance of non-price competitiveness or in other words quality production.

This thesis builds on the existing empirical literature on international trade with heterogeneous firms. It extends the existing literature in various ways. First and foremost, this thesis contributes to this ongoing and developing literature using Turkish data. Secondly, unlike previous studies that investigates single feature of the export behavior, in this thesis stream of analysis merged to shed light on the export behavior of firms. Using same data set for a sequence of analysis has explored the opportunity to come up with a coherent story. Thirdly, our work is related to the studies of changing export behavior under crisis. The recent global financial crisis has fostered the empirical literature that studies the impact of financial shocks on export behavior. Amiti and Weinstein (2009) using Japanese firm-level data evaluated explanation power of deteriorated bank health on large export declines in the recent crisis. Bernard et al. (2009) investigate the impact of the Asian crisis on US exporters and find that the most of declines in US exports came from intensive margin. Bricongne et al. (2010) study export behavior of the French firms in the 2008-2009 crisis. Behrens et al. (2010)

using Belgian firm-level data investigate the determinants of considerable trade decline with 2008-2009 crisis. We contribute to this literature using Turkish economy's crisis experience and advantage of our data set. Unlike existing studies, not only the recent global crisis but also other two major macroeconomic crises, 1994 and 2001 crises, of Turkey are considered to shed light on this issue. Moreover, the importance of sunk-costs, which is assumed to be exogenous, has been well documented both theoretically by Melitz (2003) and empirically by Roberts and Tybout (1997) in this literature. However, Sutton (1991) introduced endogenous sunk-costs concept referring to the costs that firms are ready to give for increasing consumers' willingness to pay for their products. Endogenous costs are considered to be the investment for quality and they cover R&D, marketing and advertisement expenditures. In marketing literature, those expenditures are also considered as an indication for non-price competitiveness and expected to have positive relation with the exporting activity. In this thesis, unlike previous studies that use only R&D expenditures as explanatory variable for quality, we consider R&D expenditures and marketing-advertisement expenditures separately in the analysis. This is important since in developing countries, like Turkey, business R&D expenditures are fairly low and they are usually net importer of technology which can lead misleading results for quality-export relation. These contributions have been achieved by applying suitable and current techniques to a rich, comprehensive data set constructed by CBRT. Building up and preparing this large data set for the first time in this manner was another useful outcome of this thesis.

The plan of this thesis is as follows. In Chapter 2, leading studies of the literature are reviewed. Chapter 3 discusses existing firm-level panel datasets for Turkey and then provides summary statistics. In Chapter 4, estimation variables are discussed. Chapter 5 contains detailed investigation of the export behavior of Turkish manufacturing firms. Export premium, testing self-selection and learning-by-exporting hypothesis and testing existence of sunk-costs are carried out in this chapter. Firms' entry-exit dynamics into export markets is also analyzed in this chapter. The

export behavior of the firms under different crises is explored in Chapter 6. Finally, in Chapter 7, main conclusions of this thesis are discussed.

CHAPTER 2

LITERATURE REVIEW

LITERATURE REVIEW

For centuries, countries have been exchanging goods and services to meet their needs. Trade exists between countries since different countries have different resources and technologies which provide competitive advantage. As countries become more industrialized, technology becomes more advanced and transportation costs become cheaper, economic interactions across the world has been expanding and the importance of international trade has been increasing. Trade is as old as mankind and this brings forth overloaded international trade literature both on theoretical and empirical framework. The aim of this chapter is not give full list of the existing literature instead to consider leading and related works. The literature survey in this chapter will be discussed in twofold, both in theoretical and in empirical framework.

Theoretical framework starts with the oldest economic doctrine called mercantilism. Contrary to mercantilist view, traditional trade theories used comparative advantage concept to demonstrate the gains from free trade. Traditional trade theories predict that countries will export industries that have comparative advantage and import industries that have comparative disadvantage which explain the inter-industry trade. Although traditional trade theories are satisfactory for explaining inter-industry trade, empirical observations exposed the shortcomings of these theories. Trade figures point out the existence of intra-industry trade that takes place between relatively similar products. In order to explain the observed stylized facts about trade patterns, Krugman introduced the first model for intra-industry trade under the name of new trade theory. Although both old and new trade theories have important contributions, they all assume firms are identical which implies, if one firm decides to export than all others export too. However, micro-data show that only a fraction of firms in any given

industry exports and pre-existing theoretical models are not sufficient to explain firms behavior. In response to a growing empirical evidence for the existence of substantial firm heterogeneity, a new theoretical strand of literature on international trade has begun to focus on the export behavior of firms under the heterogeneous firm assumption. Henceforth, firm heterogeneity becomes the foundation block for most of the theoretical trade models. Those new models are at the basis of this thesis.

Contrary to long established theoretical foundation, empirical literature on exporting behavior of the firms is not so old. This is mainly due to the lack of suitable firm-level data. As firm-level data became available, empirical literature started to grow and to influence the theoretical literature. In the following sections, evaluation of the literatures with the influential works will be discussed in more details.

2.1 Theoretical Framework

Theoretical literature contains a vast amount of theories that analyzes the basis and the gains from international trade. Broadly, those existing theories are classified as classical, neo-classical, new and "new" new international trade theories.

2.1.1 Traditional and New Trade Theories

First economic theory concerning international trade emerged from Europe during mid 16th century, now known as mercantilism. According to the mercantilists, precious metal holdings of a nation reflect the national wealth and power. They believe that governmental regulations on foreign trade were mandatory in order to increase nation's wealth by restricting imports and encouraging exports. During that period, under the mercantilism trend, international trade activities were controlled with various policies by governments. Exports were subsidized and imports were frustrated with high tariffs by the governmental policies. Mercantilist view was dominant till18th century. International trade policy trends have been changed with Adam Smith's expressions that were in favor of free trade.

In 1776, Adam Smith, criticized mercantilism view in his seminal work, The Wealth of Nations and emphasized the gain from free trade and specialization. Smith's argument used the principle of absolute advantage. *Absolute advantage* of a country in producing a commodity refers to the ability of producing the same amount of that commodity using fewer resources when compared with other countries. Smith considered a simple economy in which labor is the only factor of production and he showed that if labor becomes more specialized and if each country produces only goods that have absolute advantage, then all parties will benefit from free trade. Although, Smith's view was basically correct, it has some clear limitations. As stated in Salvatore (1995, p.30) the absolute advantage principle can only be used to explain trade between developed and developing countries. Moreover, this principle implies improbable trade among developed countries. Insufficient points of Smith's approach were remedied by David Ricardo and he introduced the comparative advantage concept into international trade.

In 1817, David Ricardo published Principles of Political Economy and Taxation that contains the fundamentals of international trade theory. Ricardo based his theory on comparative advantage principle and asserts like Smith that if a country specialize in the production and export the commodity in which it has comparative advantage and import the commodity in which it has comparative disadvantage then all parties will benefit from free trade. A country is said to have a comparative advantage in a good if its opportunity cost of producing the good is lower than that of other countries. Different than Smith's absolute advantage approach, Ricardo's comparative advantage contains comparison both between countries and between products. Briefly, according to the Ricardian trade theory, labor requirement differences of commodities across countries imply different internal price ratios which are evidence for the comparative advantage that generate beneficial trade opportunities for both countries. Although, Ricardian model constitutes the backbone for most of the trade models, it suffers from several shortcomings. The Heckscher-Ohlin (H-O)

trade model was developed in order to fill the gaps remained from Ricardian model.

The H-O theorem is established on Ricardo's comparative advantage framework. However, the main priority is that it explains the source of the comparative advantage instead of assuming as in the classical trade theory. According to H-O theorem, differences in the relative prices of different goods in different countries lead to international trade and the endowment differences of the countries leads to commodity price differences through factor price differences. It is assumed that there are two countries (home and foreign) and two commodities (commodity X and Y) as in the classical trade model. Moreover, again it is assumed that both countries use the same technology with constant return to scale and all markets are perfect and tastes are same in both countries. Perfect factor mobility within each country but no international factor mobility is assumed as before. Transportation costs, tariffs or any other costs that can obstruct free flow of international trade are omitted. Different then the classical trade model, it is assumed that there are two factors of production (labor and capital) and one of the commodities is labor intensive and the other is capital intensive. Difference in factor endowments of the countries together with the factor requirement differences of the commodities generates differences in the pre-trade relative commodity prices that lead to the comparative advantage of the countries. Given these assumptions, the H-O theorem asserts that a country will export the commodity that requires the intensive use of the country's relatively abundant and cheap factor and import the commodity that requires the intensive use of the nation's relatively scarce and expensive factor.

The prediction of the traditional trade models, both classical and neo-classical, is that countries will export industries that have comparative advantage and import industries that have comparative disadvantage. Hence, the traditional trade models provide explanation towards inter-industry trade and leave unexplained a large portion of international trade. Trade figures reveal the fact that a large share of international trade takes place between relatively similar products. The existence of intra-industry

trade seems to contradict with the traditional trade theory. This stimulated new attempts to explain the occurrence of intra-industry trade and led to the development of new trade theories.

The most comprehensive and widely accepted explanation was proposed by Paul Krugman (1980) known as "New Trade Theory". Increasing returns to scale (IRS), imperfect competition and variety love preferences assumptions play a central role for explaining inter-industry trade in the Krugman model. Krugman assumes that there are two identical countries (Home and Foreign) in terms of technology, preferences and endowments. It is assumed that labor is the only non-traded factor of production and there is a monopolistic competition. Regarding consumers, it is assumed that consumer preferences are homothetic and identical within and across the countries and they love variety. With these assumptions, Krugman model demonstrated that trade is possible and mutually beneficial between countries with the same characteristics (same tastes, technology and factor endowment). An extended version proposed by Helpman and Krugman (1985) combines Krugman model with Heckscher-Ohlin model. Although they have important contributions to the international trade theories, traditional models all assume firms are identical which implies, if one firm decides to export than all others export too. However, micro-data show that only a fraction of firms in any given industry exports. In response to a growing empirical evidence for important heterogeneity of firms' trade orientations within sectors in recent years, a new theoretical strand of literature on international trade has begun to focus on the export behavior of firms under the heterogeneous firm assumption. Recently, interactions between financial market imperfections and trade patterns have attracted attention and more recently a particular attention has been given to the exchange rate movements-financial market imperfections and trade patterns relation.

2.1.2 The "New" New Trade Theory

Melitz (2003) integrates empirical evidence firm heterogeneity into Krugman's traditional trade model in order to capture more realistic case. The Melitz model has become basic framework in international trade models with heterogeneous firm assumption. Incorporating firm heterogeneity into theoretical model leads to new insights about the trade patterns especially ones that are observed in real data. Melitz model has been extended by considering financial market imperfections by Chaney (2005) and Manova (2006) that brings out new remarkable predictions. Melitz model and its extensions developed by Chaney constitute the theoretical framework of this thesis and they deserve detailed and special treatment. The remaining of this chapter is devoted to Melitz model and its extensions.

The Melitz Model

Preferences and Demand Side

Consumer preferences are assumed to take constant elasticity of substitution (CES) form as in Krugman.

$$U = \left[\int_{\omega \in \Omega} q(\omega)^{\rho} d\omega \right]^{1/\rho}, \quad 0 < \rho < 1, \tag{1}$$

where Ω denotes the available products and $\sigma = 1/(1-\rho)$ is the constant elasticity of substitution. The CES assumption for the preferences corresponds to variety loving preferences since marginal utility of consumer increases as the variety consumed increases. Given this preferences, consumers maximize Equation 1 subject to the budget constraint given by:

$$\int_{\omega \epsilon \Omega} p(\omega) q(\omega) d\omega = R \tag{2}$$

which gives rise to the following demand and price equations.

$$q(\omega) = \left(\frac{p(w)}{P}\right)^{-\sigma} \frac{R}{P} \text{ and } P = \left(\int_{\Omega} p(\omega)^{1-\sigma} d\omega\right)^{\frac{1}{1-\sigma}} \quad \textbf{(3)}$$

Production and Supply Side

In the supply side, similar to Krugman model, it is assumed that production takes place under increasing returns to scale, labor is the only production factor and the market structure is monopolistic competition. The difference from Krugman arises in marginal cost structure. In Melitz, it is assumed that each firm has to pay sunk entry cost of f units of labor in order to become potential producer. Paying this sunk entry cost lets the firm to draw its productivity level φ from a known distribution, $G(.)$. With this given assumption total cost of production of q units for a firm with labor productivity φ is:

$$TC = f + \frac{q(\varphi)}{\varphi}, \quad \textbf{(4)}$$

where f denotes the fixed production cost and $q(\varphi)/\varphi$ constant variable cost that depends on firms productivity. Hence according to Melitz model, firm heterogeneity arises from productivity differences of the firms. Higher productivity of the firm implies higher output and higher revenue, lower prices and higher profits.

Firms Entry and Exit

It is assumed that there is large number of potential producers and prior to entry all firms are identical. However after paying the fixed entry costs, f, each firm draws its productivity level which introduces the heterogeneity. After observing the productivity level, potential producer decides whether to become producer or to exit the market immediately if the productivity draw is low. This is the one of the main features of the model

that matches with the empirical findings that exiting firms are on average of lower productivity than surviving firms. If it decides to become producer, there is still failure risk for some exogenous reasons with probability δ in every period. In addition to exogenous exit risk, also there is an endogenous exit probability.

A firm will continue to be producer only if it earns positive net profits in each period. Melitz defined a productivity cut-off, $\bar{\varphi}$, such that $\pi(\bar{\varphi}) = 0$. In equilibrium all firms with productivity above the given cut-off value produce and other exit.

Prior to entry, each potential producer has to compare the expected profit that can earn if they enter with the fixed sunk-entry cost. Denoting the expected profits conditional on being in the business by $\bar{\pi}$, the net value of entering today given constant probability of dying each period is given as in Melitz (2003) as follows:

$$v^E = E\left[\sum_{t=0}^{\infty}(1-\delta)^t \pi(\varphi) - f\right] = \frac{1-G(\bar{\varphi})}{\delta}\bar{\pi} - f \qquad \textbf{(5)}$$

Free entry condition is then defined as $v^E \leq 0$. Closed economy equilibrium is given by the productivity cut-off and free entry conditions.

Export Status

Melitz assumed that a firm who intended to become exporter needs initial fixed investment. In other words, it is assumed that there is export market entry cost,f_e. Existence of export market entry cost implies that only those productive firms that can afford this cost can become exporter which is consistent with the empirical findings of self-selection of the exporters. A firm becomes exporter only if net profits it generates from exporting is positive,$\pi^X(\varphi) \geq 0$, and this yields productivity cutoff for exporting, $\bar{\varphi}^X$. At equilibrium the zero profit cutoff condition for exports $\pi^X(\varphi) = 0$ has to be satisfied. However in order to be consistent with the empirical evidence

Melitz imposed additional simple restriction such that exporting productivity cut-off exceeds the productivity cut-off $\bar{\varphi}^X > \bar{\varphi}$ so that not all firms export.

Open economy equilibrium is given by the conditions for productivity cut-offs, labor market clearing and free entry.

Main Findings of the Melitz Model

Aggregate productivity increase and reallocation of the resources of market shares and profits among firms are two important and main findings of the Melitz model. More precisely, opening to trade leads to more competitive domestic markets by the entrance of productive foreign competitors. Higher competition implies lower profits which forces least productive firms to exit and encourage productive firms to export. Therefore market share of the least productive firms that ceased production are replaced with more productive and large firms which in turn resulted with aggregate productivity increase. The reallocation mechanism works such that as new foreign competitions enter into domestic markets all firms will lose market shares and therefore loss some profits. Some firms can compensate domestic profit loss by exporting but some of them cannot do this and trade opening leads to profit inequality between firms to increase. Melitz model that incorporates firm heterogeneity into theoretical framework helps to capture most of the empirically observed trade patterns. Additional to these general findings, Melitz model tells more about the trade pattern. Chaney extended the fruitful Melitz model and made important contributions to the heterogeneous firm trade literature.

Chaney (2005): Liquidity Constrained Exporters

Chaney (2005) added liquidity constraints to the Melitz model with the reasoning that existence of sunk costs implies the importance of financing. He predicts that in the presence of fixed exporting costs, liquidity constraints play an important role in the export decision of the

heterogeneous firms. In addition to productivity level, liquidity constraints of the firms will also generate barrier for the entrance into export markets. In other words, in the presence of fixed exporting costs and liquidity constraints, although some firms can profitably export due to the insufficient liquidity they are not able to export. He suggested that exporters are typically the firms that are not liquidity constrained.

Chaney (2005) made important contributions to the literature that studies the link between financial markets and international trade. Another important contribution of this model is that it provides new insights to the interactions between exchange rate movements and international trade.

Traditional trade theory predicts that currency devaluation will stimulate the exports due to increasing competition of the exporters. However incorporating firm heterogeneity, fixed exporting costs and financial market imperfections, Chaney (2005) proposed another dimension of exchange rate-export interaction. According to Chaney (2005), the exchange rate appreciation has three different impacts on exports which lead to ambiguity of net effect. Appreciation of exchange rate may lead to the loss of market share of the existing exporters and reduction in their exports (intensive margin falls) due to the loss of competitiveness. Moreover, the least productive exporters are forced to exit the export markets. These two effects are named as competitiveness effect. On the other hand, at the same time, the most productive constrained firms start exporting by the appreciation of domestic assets of those constrained firms in abroad and this is named as balance-sheet effect of exchange rate on trade. If the goods differentiation is high so that competitiveness effect is mild then an appreciation of the exchange rate may increase the aggregate exports according to Chaney as opposed to classical trade propositions. Moreover, he asserted that these two opposite effects (competitiveness and balance-sheets effects) are the main reason for the observed sluggish responses of trade to large devaluations.

2.2 Empirical Framework

The empirical literature on the exporting behavior of firms has been started with the pioneer paper by Bernard and Jensen (1995). In order to open different window to the debates concerning the issue of US manufacturing competitiveness they used large panel data of firms. In this way, unlike up until now international trade studies that concentrated on countries and/or sectors they were able to investigate the contribution of the exporting firms to the manufacturing sector. Using both simple descriptive analysis and export premium calculated from ordinary least squares (OLS) regression of firms characteristics on export status, authors concluded that the typical exporting plant is larger, pays higher wages and is more capital intensive and more productive than its nonexporting counterpart. This paper and its findings provided the basis for many other panel data studies that covers both developed and developing countries. Bernard and Jensen (1998, 1999) for the United States (U.S.), Bernard and Wagner (1998) and Wagner (2002) for the case of Germany; Aw et al. (2000) for the case of Taiwan and Korea; Clerides et al. (1998) for the case of Colombia, Mexico and Morocco; Girma et al. (2003, 2004) and Greenaway and Kneller (2004) for the case of the U.K, Head and Ries (2003) for the case of Japan, Delgado et al. (2002) for the case of Spain, Hallward-Driemeier et al. (2002) for the case of Thailand, Indonesia, the Philippines and Korea, Bigsten et al. (2004) for the case of sub-Saharan Africa and Yang and Mallick (2010) for China. Conclusion from numerous studies for different countries is comparatively clear; exporters are superior to non exporters. This common and robust finding throws up a window to a second set of studies which focus on the direction of the causality between performance of the firms and exporting activity.

In order to explain the superiority of the exporters, the literature evolved by testing validity of two hypotheses, self-selection and learning-by-exporting. A firm that decides to become an exporter faces with some challenges. Those challenges are some additional costs (such as transportation and marketing) and additional investment for responding

foreign customer tastes. It is presumed that challenges can only be covered by good firms (large, productive, profitable, technology and capital intensive). Hence, in this circumstance observing better performance for exporters is expected and this situation is hypothesized and named as self-selection of the exporting firms. On the other hand, according to another view, firms that enter into export markets exposed to more competition. Once a firm enters the export markets, he learns how to cope with intense competition which leads to faster improvement in the performance measures. Hence, according to the learning-by-exporting hypothesis, engaging exporting activity improves the firm's performance and it points out the other direction of the causal relation. These two alternative hypotheses were first analyzed empirically by Bernard and Jensen (1999b) and Clerides et al. (1998). While Clerides et al. (1998) investigated the causal relationship between success and exports for Colombia, Mexico and Morocco, Bernard and Jensen (1999b) examined for US. Although their econometric approaches and data used were different, the conclusions were similar. They found no strong evidence for the existence of learning effect and they concluded that indeed better firms self-select into export markets. Hence, the source of observed performance difference between exporters and non exporters dedicated to self-selection of the exporters. Wagner (2007) gives detailed survey for the literature of export behaviors of firms and he surveyed 54 empirical studies covering 34 countries and the general finding is that exporter are better and those better firms self-select into the export markets. Hence, self-selection hypothesis is commonly accepted commentary for the superiority of the exporters.

Findings in favor of self-selection direct researches towards investigation the impact of sunk-cost on the export decision of the firms. Theoretical papers, Dixit (1989a, 1989b), Baldwin (1989), Baldwin and Krugman (1989) and Krugman (1989) showed that existence of sunk entry cost for the foreign market produces hysteresis in trade flows. Using this result, Roberts and Tybout (1997) derived a model for export decision with sunk cost and proposed a method for testing the existence of sunk cost. They used dynamic discrete choice model for export status of the firms. The

test for existence of sunk cost is related with the significance of previous export status on current export decision. Using panel data for Colombia authors concluded that previous exporting history of the firms had an effect on the current exporting status. This is interpreted as the existence of sunk cost. Using same logic, existence of the sunk cost has been examined for different countries and these studies reveals strong evidences for the presence of sunk costs in the entry[5].

Empirical findings supporting the existence of high sunk costs lead the most recent literature considering export decision under liquidity constraints. Muuls (2008) used a panel of Belgian manufacturing firms to investigate the relation between liquidity constraints and exporting behavior of the firms for 1999-2005 periods. Muuls concluded that firms with higher productivity level and lower credit constraints are more likely to export. Bellone et al. (2010) investigated the link between financial constraints and export behavior using French manufacturing firms and showed that better financial health increases the likelihood of becoming exporter. Minetti and Zhu (2011) studied the impact of credit rationing on firm's export using Italian manufacturing firms and concluded that rationing affected both the likelihood of becoming exporter and the foreign sales.

Recent empirical literature has been giving a particular attention to the investigation of interactions between liquidity constraints, exchange rate movements and export decisions of the firms in order to gain more insight about unresponsiveness of trade to large devaluations especially after economic turmoil. Contrary to traditional trade theory predictions, empirical investigation of real exchange rate changes on export pattern reveals that favorable exchange rate movements not always create run ups in exports besides it can lead to a decline in some circumstances. For example in the case of 1997-1998 Asian financial crisis the impact of large devaluations was fairly limited for the Asian economies. Blalock and Roy (2007) noted that 50 percent real depreciation of rupiah is one of the largest in recent Indonesia history. However, despite this historically large depreciation

[5] Aw and Hwang (1995), Clerides et. al (1998), Bernard and Jensen (1998, 2004), Girma et. al (2004), Sinani and Hobbdari (2010), Özler et. al (2009).

aggregate export data did not show any uptrend. Not only for Indonesia but as Duttagupta and Spilimbergo (2004) mentioned the overall effect of the Asian crisis in the region was a modest increase in export volume. Blalock and Roy (2007) refer this situation as “export puzzle”. “New” new theoretical models that are mentioned in the previous section are able to explain those observed trade patterns. Chaney model predicts that exchange rate changes not only affect the amount of exports through competitiveness channel but also the entry-exit patterns of the firms in opposite direction through balance-sheets channel leading to ambiguous net impact of the exchange rate movements on exports. Therefore, in the recent period the importance of firm-level analysis has been recognized even for investigation macroeconomic interactions.

Blalock and Roy (2007) using large panel data set for Indonesia manufacturing firms try to explain the absence of export boom following the large devaluation caused by financial crisis. At the preliminary stage, exporting behavior changes over time are investigated by identifying export trends by exporter type in which each firm categorized according to the export history into five mutually exclusive types: Quitting Exporters, Starting Exporters, Continuing Exporters, Entering Exporters and Dying Exporters. Descriptive analysis shows that entry-exit dynamics of the firms changed dramatically following the devaluation. After confirming changing export behavior of firms following devaluation, authors tried to identify firm-level attributes that leads to changes in export behavior using World Bank survey however survey data did not help. Next, they tried to make this identification via econometric modeling and estimated likelihood of pre-crisis exporters to continue exporting post-crisis, likelihood of pre-crisis non-exporters to export post-crisis and effect of pre-crisis exporter attributes on post-crisis exporter output separately. Although not mentioned by authors explicitly, this fiction reflects the predictions of Chaney (2005). If we recall, according to Chaney (2005), the impact of exchange rate appreciation on export behavior can be summarized as follows: Some of the least productive exporters cease to export due to the negatively affected competitiveness. With the appreciation of the domestic

currency they lose market share and force to exit. Contrarily, some of the less productive but liquidity constrained firms start to export since appreciation causes the relaxation of the liquidity constraint. The value of domestic assets in foreign currency gains value. On the other hand, existing exporters lose market shares and reduce their exports due to the impact of competitiveness loss arises from appreciation. The first two mentioned impacts lead to changes in the set of exporters that is to say in the extensive margin of trade and they are tried to be covered by the first two econometric models given above (likelihood of pre-crisis exporters to continue exporting post-crisis and likelihood of pre-crisis non-exporters to export post-crisis). The mentioned last effect changes the exports amount of existing exporters (intensive margin of trade). Hence, the impact of real exchange rate on intensive margin is tried to be captured by the last econometric model given above. They concluded that devaluation after the crisis led to considerable increase in the extensive margin of trade (new exporters emerged) and simultaneously led to the failure of many pre-crisis exporters that accounts for the absence of an export booms.

The recent global financial crisis has fostered the empirical literature that studies the impact of financial shocks on export behavior. Amiti and Weinstein (2009) using Japanese firm-level data evaluated explanation power of deteriorated bank health on large export declines in the recent crisis. They concluded that the health of the financial institutions plays important role in the firm-level exports during the crises. Bernard et al. (2009) investigate the impact of the Asian crisis on US exporters and find that the most of declines in US exports came from intensive margin. Bricongne et al. (2010) study export behavior of the French firms in the 2008-2009 crisis and conclude that all firms have been evenly affected from the crisis. While large exporters mainly decreased their export sales, smaller exporters were forced to reduce the range of destinations served or to cease exporting. Behrens et al. (2010) using Belgian firm-level data investigate the determinants of considerable trade decline with 2008-2009 crisis. They found that the decline in trade stemmed from the intensive margin of trade and the extensive margin of trade impact was very limited.

The presence of sunk-costs influences export behavior of the firms from different perspective. Dixit-type model shows that in the existence of sunk-costs, firms export decision is considered as forward looking problem. Both theoretical and empirical models reveal the fact that in the existence of sunk-costs, some firms choose to absorb adverse effects of though periods and remains in the export markets in order to avoid paying re-entry costs. On the other hand, non-exporters have opportunity to wait until better or improved conditions attained for considering becoming exporters but they have to make an important decision about the appropriate timing for entrance into export markets. Therefore factors determining the survival of the exporters in international markets and the factors determining the waiting time for becoming exporter has been started to attract attention in the recent period. Sabuhoro and Gervais (2004) applied survival analysis in order to investigate the factors that determine the success or exit of Canadian exporting firms. Perez et al. (2007) investigated persistence in export behavior of Spanish manufacturing firms via survival analysis.

For Turkish empirical economic literature, analyzing export performance is one of the most popular topics. Among them, studies that concentrate on exchange rate exports relation have been stand out since there always has been ongoing debate about the importance of exchange rate for the export performance. Traditional trade models prediction about the encouraging impact of devaluated exchange rate on exports have been tested numerously for Turkey. Different crises resulted with high rates of devaluations in Turkey enable researchers to test this prediction empirically. Nevertheless, no consistent result has been obtained from those numerous studies. Some of studies[6] conclude that real exchange rate is the leading actor for the export performance of Turkey whereas others[7] could not find any evidence for this. Even if we discount those contradictory results, Turkey's recent notable export performance despite of real

[6] See Arslan and van Wijnbergen (1993), Barlow and Şenses (1995), Uygur (1997), Saygılı, Şahinbeyoğlu and Ulaşan (1998), Şahinbeyoğlu and Ulaşan (1999), Özatay (2000), Akbostancı (2004).

[7] See Zengin and Terzi (1995, 1999), Atabek and Çevik (2001), Sivri and Usta (2001), Aydın, Çıplak and Yücel (2004).

appreciated Turkish lira creates the need for a more detailed examination of the export behavior.

When empirical applications of the exporting behavior of firms for the case of Turkey are surveyed, we encountered with limited number of studies. Yasar, Nelson and Rejesus (2003) analyze the productivity effects of export status at different points of conditional output distribution and investigate the productivity effects of firms at different export status. TURKSTAT Annual Surveys of Manufacturing Industries was used and only apparel, food and textile industries were considered for the 1990-1996 period. The results indicated that the productivity effect of exporting was present at all points along the conditional output distribution. Yasar and Rejesus (2005) examined the learning-by-exporting hypothesis for the case of Turkey using TURKSTAT Annual Surveys of Manufacturing Industries for a period covering 1990-1996. They found evidence for the existence of the learning-effect. Yasar et al. (2007) try to determine whether learning-by-exporting is evident in two Turkish manufacturing sectors - the textile and apparel and the motor vehicle and parts industries. They used data from TURKSTAT Annual Surveys of Manufacturing Industries. Aldan and Günay (2008) using different dataset from Central Bank of the Republic of Turkey Sector Company Accounts Survey tested two alternative hypothesis, self-selection and learning-by-exporting, using matching and difference-in-difference technique. They found evidences that support both hypotheses. Özler et al. (2009) examined export market participation decision of Turkish manufacturing plants for 1990-2001 periods within the sunk-cost framework. They used TURKSTAT Annual Surveys of Manufacturing Industries and the results support the presence of sunk-cost. Kılıçaslan and Erdoğan (2012) used the largest 1000 industrial enterprises that are published annually by the Istanbul Chamber of Industry for the period 1997 to 2007 in order to analyze the validity of the learning-by-exporting hypothesis. Using unbalanced dynamic panel data models they did not find any evidence for the learning-effect. Maggioni (2012) using TURKSTAT Annual Surveys of Manufacturing Industries for the period 1990 to 2001 examined learning-by-exporting hypothesis.

This thesis will be the first and unique not only for Turkey but also for the empirical literature. To our knowledge, there is no such detailed study in the literature. In this thesis, the export behavior of the Turkish manufacturing firms is treated exhaustively from different perspectives.

2.3 Conclusion

Heterogeneous firms and trade literature highlight the importance of empirical investigation. Empirical evidences have been shaping the development of the theoretical literature. Various hypotheses have been tested for various countries since the pioneer work of Bernard and Jensen (1995) using different data sets, different variables and different time periods. Each study constitute only single piece of the big puzzle. In this thesis, the aim is to combine all the available pieces together in order to facilitate understanding of the big picture. To our knowledge, this thesis is unique in investigating exporting behavior of the firms in such a detailed and integrated way.

More than three decade exports are considered as the leading sector of the economy. The rise of the Turkish economy especially for the last decade together with the potential due to its proximity to different markets makes Turkey noteworthy economy. Moreover, Turkish economy has been experienced three important and different origin crises since 1990 that provides unprecedented research environment. Despite the importance of exports and privileged properties of Turkish economy, firm level investigation of export pattern is fairly limited and insufficient as all can recognize from the list given in the empirical framework section. In this thesis fairly large data set for fairly long time period, 1989-2010, is used. Hence the data set used in this thesis embrace all required properties for the unity and robustness of the detailed firm-level export behavior analysis.

CHAPTER 3

DATA T

DATA SET

Micro data allow performing detailed analysis. In our case, comprehensive and representative sample is required in order to put forth export behavior of the Turkish manufacturing firms satisfactorily. Unfortunately, firm-level data source in Turkey is fairly limited and even access to the existing ones is not easy due to privacy issues.

3.1 Comparison of Existing Data Sources

When studies in this field are surveyed, Yaşar, Nelson and Rejesus (2003, 2007), Yaşar and Rejesus (2005), Özler et al. (2009) and Maggioni (2012) used TURKSTAT Annual Survey of Manufacturing Industries (ASMI). Kılıçaslan and Erdoğan (2012) used the largest 1000 industrial enterprises that are published annually by the Istanbul Chamber of Commerce and Aldan and Günay (2008) used Central Bank of the Republic of Turkey (CBRT) Company Accounts database. Datasets compiled by CBRT and TURKSTAT are two leading and comprehensive ones but coverage and the contents are different. However, both datasets have their own advantages.

From 1983 to 2001, TURKSTAT collects enterprise level data via ASMI. The coverage of ASMI changed over time. For 1983, establishments with 10 or more employees in the private sector was covered, for 1984-2001 period establishments with 25 or more employees in the private sector was covered. Beginning from 2002, similar data have been started to be collected under the name of Annual Industry and Services Statistics (AISS) but the coverage is different. In AISS, for the enterprises having more than 20 employees full enumeration; for the enterprises having less than 20 employees sampling method is used. For the case of CBRT dataset, on the other hand, no such limit for the coverage exists; the volunteer participation

is applied. When the share of the firms with respect to number of employees is investigated it is observed that on average 16.3 percent of the existing manufacturing firms have less than 20 employees.

Compiled statistics also differ for two data sets. While TURKSTAT dataset contains information reflecting the structural characteristics such as qualification of employees by gender, wages, goods and services purchased sales and value of goods rendered, stocks, energy usage, inputs-outputs and value-added and fixed capital investment, CBRT dataset contains information mainly on financial structure of the firms.

The main shortcoming of the TURKSTAT data set is that it only covers 1983-2001 periods and it does not suitable for up-to-date analysis. On the other hand, CBRT data set covers 1989-2010 periods with fairly large number of observations. Another advantage of this dataset comes from the fact that it covers a time period that spans different crises, thus allowing analyzing the export behavior of firms in response to different crises.

Apart from technical problems, the main practical problem of the TURKSTAT data set is about its accessibility. TURKSTAT firm-level dataset is not available for public usage and it requires special authorization. Nevertheless, CBRT allows access to dataset for research purposes. In order to avoid loss of privacy, firm name and tax identification number is removed and user of the dataset can only observe unique identification numbers that are given to each firm.

Accessibility, consistency and lengthy coverage are the main advantages of the CBRT database. Due to its mentioned advantages, in this thesis, CBRT Company Accounts data set is used.

3.2 CBRT Company Accounts Data Set

CBRT data set provides detailed firm-level information for comprehensive number of firms for fairly long time period. Since 1989, balance sheets, income statements and firm specific information such as employment, establishment date, company town and legal status have been

collected from financial and non-financial firms on an annual basis. Unique identification numbers given to each firm allow matching across the years to form a panel data set. Its panel structure and comprehensive coverage, makes this dataset as good as gold for the microeconomic analysis.

The data has been compiling by economic sectors, classified according to four-digit level of NACE (Nomenclature Générale des Activités Economique dans les Communautes Européennes) Rev 1.1 but are aggregated to the two-digit level for most analysis herein[8, 9]. The majority of the Turkey's export is provided by the manufacturing sector. For this reason, for exploring the export behavior of Turkish firms, **only the manufacturing sector is considered**.

This valuable and unique data set needs to be reviewed at the first stage as all other data sets. This is crucial for robust, coherent and reliable analysis and results. Data is collected based on volunteer information and continuous participation or complete information for the given year cannot be expected. Hence some of the firms have to be excluded due to either missing information or inadequate number of observations. Those firms that do not partake in the sample at least two consecutive years or that do not have at least three observations are excluded. It can be argued that omitting those firms that did not survive at least 3 years can generate selection bias due to success. However, the number of observation that possesses these exclusion criteria is fairly limited: 1664 observations (belonging to 271 firms) only constitute 1.9 percent of total. As a result our final dataset contains 86675 observations corresponding to 8738 manufacturing firms. The following figure shows the distribution of the manufacturing firms for the observation period, 1989-2010.

[8] In 2010, economic sector classification is changed from NACE Rev 1.1 to NACE 2. The sector codes of the firms according to NACE Rev 1.1 for year 2010 are provided by CBRT.

[9] List of the two-digit manufacturing sectors and their corresponding abbreviations used in the text are given in Appendix A.

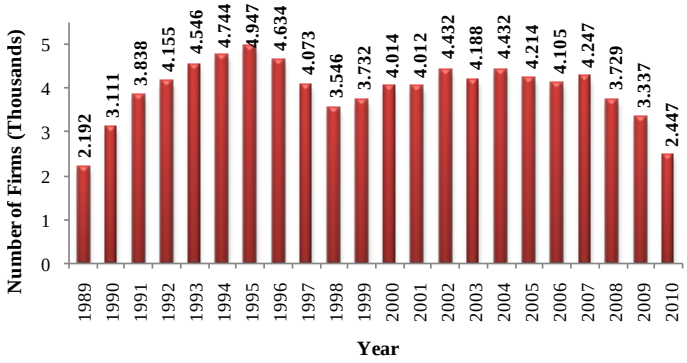


Figure 3.1 Number of manufacturing firms used in the analysis

The number of employees is an important variable for our analysis and some of the firms either do not provide this information for several participation years or incorrect entry exists. Instead of omitting those firms, we prefer to use a simple imputation algorithm in order to minimize data loss due to missing on the number of employees. The imputation process started with the outliers check (incorrect entry) of the data. Considering the total number of observations, firm by firm investigation of the employment statistics is not plausible in practice. Therefore an ad-hoc condition is determined and any entry that satisfy this condition is classified as an outlier. If the entry for the number of employee exceeds ten times the median of the firm's number of employee then that entry is considered as outlier and converted into a missing value. In total of 86675 observations, 184 outliers are detected. With these outliers that are converted into missing, 870 observations have missing data for the employment. The following simple imputation algorithm is used for the missing data;

(1) If X_t is missing but X_{t-1} and X_{t+1} are not then X_t is implemented by $(X_{t-1} + X_{t+1})/2$.

(2) If X_t and X_{t-1} are missing but X_{t+1} is not, then X_t implemented byX_{t+1}.

(3) If X_t and X_{t+1} are missing but X_{t-1} is not, then X_t implemented by X_{t-1}.

Although it seems the size of the sample is adequately large, its representativeness can be interrogated. The representativeness of the sample is evaluated with respect to the total number of workers and turnover values. Using TURKSTAT Annual Services and Industry Statistics which can be considered as the population, coverage of the sample for the period 2003-2008 is investigated (Table 3.1).

Table 3.1 Representativeness of the Sample: 2003-2008

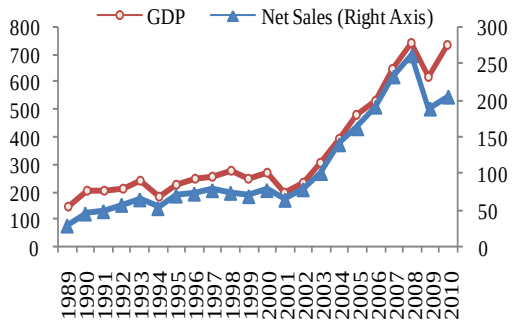
Year		Number of Firms	Number of Workers	Turnover (Million TL)
2003	Population	236275	2181718	230690
	Sample	4188	767178	150005
	Coverage rate (%)	1.8	35.2	65.0
2004	Population	281029	2404342	298230
	Sample	4432	879337	198891
	Coverage rate (%)	1.6	36.6	66.7
2005	Population	302459	2583747	328781
	Sample	4214	878894	216983
	Coverage rate (%)	1.4	34.0	66.0
2006	Population	309841	2684240	397917
	Sample	4105	919386	273910
	Coverage rate (%)	1.3	34.3	68.8
2007	Population	316596	2776303	435893
	Sample	4247	951551	303202
	Coverage rate (%)	1.3	34.3	69.6
2008	Population	321652	2858485	499431
	Sample	3729	867788	338560
	Coverage rate (%)	1.2	30.4	67.8
Average	Coverage rate (%)	1.4	34.1	67.3

Source: TURKSTAT, CBRT Company Accounts and author calculations.
For the sample, sales are used as turnover.

On average, 4152 firms in the sample correspond to only 1.4 percent of the population. However they account for 34.1 percent of the population of Turkish manufacturing firms in terms of employees and 67.3 percent in terms of turnover for 2003-2008 periods. This implies that those uncovered firms are mostly micro that do not have important contribution to total output[10].

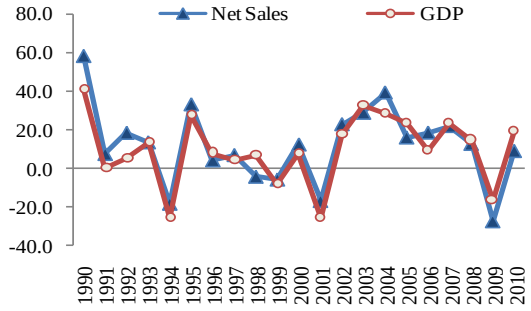
[10] For 2003, the average number of employees for the uncovered firms is around 6 which is calculated as $(2181718 - 767178)/(236275 - 4188) \cong 6$ and the average turnover is 0.35 calculated as $(230690 - 150005)/(236275 - 4188)$ which is fairly low when compared with the total average turnover, 0.98.

Moreover based on the survey conducted by World Bank for Turkey in 2008, we can assert that those uncovered firms were unlikely to engage in export activity. According to World Bank Enterprise Survey (2008), only 13.8 percent of the small firms[11] export. For those exporting firms, only 4.5 percent of total sales are exported. Those percentages are expected to be smaller for micro sized firms. Although coverage rate seems to be low, based on the reasoning given above, it is believed that the dataset possesses adequate representativeness for our purpose. Thus comparison of net sales and export figures deduced from sample with GDP and exports is reinforcing this presumption. Figure 3.2 and Figure 3.3 portrays aggregate net sales and GDP figures and their corresponding growth rates. Aggregate net sales series obtained from the data set moves together with the actual GDP which shows representation power of the sample.



Source: Minister of Development, TURKSTAT, author's own calculations.
Net sales data are converted into US $ by dividing annual total foreign sales by annual averaged US dollar exchange rate.

Figure 3.2 GDP and Net Sales (Billions US $)

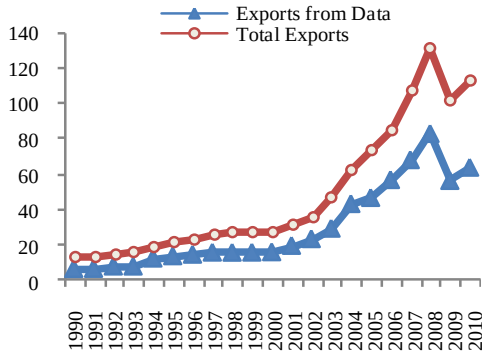


Source: Minister of Development, TURKSTAT, author's own calculations.
The annual growth rates given in these graph are calculated from the GDP and net sales that are given in Figure 3.2.

Figure 3.3 Annual Growth Rates (%)

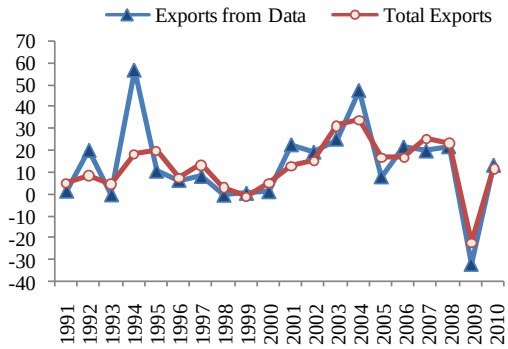
Likewise, Figure 3.4 and Figure 3.5 displays actual exports and aggregate exports obtained from data set and their corresponding growth rates. Except for spikes observed during the crisis general pattern of the data set seems successful.

[11] Firm size classification of this survey differs from ours. According to the Enterpresis survey a firm is classified as small if the number of employee is between 5 and 19. As medium if that number is between 20 and 99 and as large if exceed 100.



Source: Minister of Development, TURKSTAT, author's own calculation.
Total exports from data is converted into US $ by dividing annual total foreign sales by annual averaged US dollar exchange rate.

Figure 3.4 Exports (Billions US $)



Source: Minister of Development, TURKSTAT, author's own calculations.
The annual growth rates given in these graph are calculated from the exports figures that are given in Figure 3.4.

Figure 3.5 Export Annual Growth Rates (%)

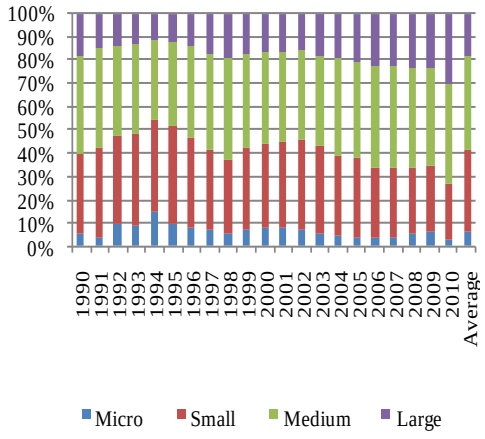
3.3 DESCRIPTIVE STATISTICS

Using descriptive analysis, general features of the data set will be explored in order to portrait general patterns of the Turkish manufacturing sector. In the first sub section, firm characteristics such as size, location, legal status of the average manufacturing firm will be revealed. In the next sub sections, structure of the production and growth in production by sectors, structure of exports and entry-exit behavior of Turkish manufacturing firms will be studied. Lastly, market choice and switching behavior of the manufacturing firms will be analyzed in the subsequent sub section.

3.3.1 Firm Characteristics of Turkish Manufacturing Sector

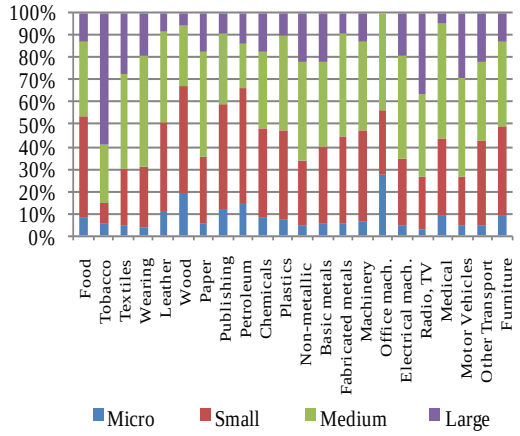
Main characteristics of the firms that can be derived from the existing information set such as size, location and legal status is investigated in this subsection. For the size classification of the firms, different criteria have been proposed in the empirical applications. Among them total employment, net sales and total assets are the most popular ones. For Turkey to be compatible to the European Union, definition of small and medium sized companies has been determined officially. Accordingly, firms are classified

as micro if their 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 lastly as large if the total number of employees exceeds 249. Using this criterion, the firms in the dataset are classified in four different size categories as micro, small, medium and large. The proportion of each size categories in total and by sectors are given in Figure 3.6 and Figure 3.7, respectively.



Source: CBRT, author's own calculations
* Each bar shows the share of each size category in the corresponding year t. Share of size category i for the corresponding year t is calculated as the ratio of number of firms that are in size category i at year t to the total number of firms at year t.

Figure 3.6 Size Distribution of Firms*



Source: CBRT, author's own calculations
* Each bar shows the share of each size category in the corresponding sector s. Share of size category i for the corresponding sector is calculated as the ratio of number of firms that are operating in sector s with size i to the total number of firms at that sector with size i.

Figure 3.7 Size Distribution of Firms Across Sectors*

In general the main drawback of firm-level studies is that datasets typically include only firms above certain size which makes results biased. Size distribution of the firms exposes one of the advantages of this data set. Not only large firms but also medium and small sized even micro firms are covered in this data set (Figure 3.6). On average, 40.7 percent of the sample is micro and small sized firms, 41.2 percent is medium-sized and 18.1 percent is large firms. As it can be observed from Figure 3.6, size of the firms has been increasing over time. In 1990, 18.3 percent of the manufacturing firms are classified as large but in 2010 large firm

proportion increased to 29.9 percent. Different from the general pattern, share of large firms in the tobacco, radio-TV and motor vehicles sectors is fairly large (Figure 3.7).

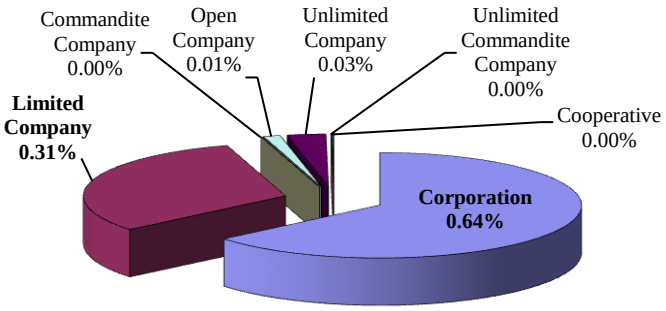
Due to its geographical position, Marmara region, with on average 56.9 percent share, is at the head of the industrialized region list. The Marmara, a bridge between Europe and Asia, is an important trade base for Turkey. Aegean and Central Anatolia has 17.3 percent and 11.6 percent shares respectively (Table 3.2). Sectoral differences were observed in the regional dispersion of the firms. Especially, food, wood and non-metallic minerals sectors seems to disperse all over the country whereas for the sectors such as tobacco and office machinery regional dispersion is low and firms in those sectors are mostly located at a specific region.

Table 3.2 Regional Dispersion of Manufacturing Firms

	Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7
Food	9.6	2.5	19.5	4.5	15.9	13.9	34.2
Tobacco	1.7	0.0	93.6	0.0	0.0	0.0	4.7
Textiles	8.9	0.8	17.7	7.3	3.9	0.4	60.8
Wearing	1.7	0.0	17.7	0.1	2.5	1.0	77.0
Leather	0.8	0.0	22.6	0.2	4.9	2.2	69.3
Wood	12.4	0.0	17.9	0.1	9.4	23.0	37.2
Paper	5.2	0.4	17.7	3.5	9.5	1.5	62.3
Publishing	1.9	0.0	11.3	1.6	22.8	0.0	62.4
Petroleum	0.0	0.0	36.2	2.9	0.0	4.4	56.5
Chemicals	4.2	0.0	15.1	0.9	7.1	1.3	71.5
Plastics	4.5	1.3	15.4	3.2	9.5	2.6	63.5
Non-metallic	7.1	2.2	22.1	2.7	15.0	10.4	40.6
Basic metals	4.6	0.3	13.0	0.5	13.8	7.3	60.6
Fabr. Met.	3.7	0.3	12.9	1.0	17.3	1.2	63.6
Machinery	4.0	0.0	16.2	1.1	24.7	3.7	50.2
Office mach.	0.0	0.0	0.0	8.7	0.0	0.0	91.3
Electrical mach.	0.4	0.8	13.7	0.0	14.9	2.3	67.9
Radio, TV	0.0	0.0	20.6	0.0	17.6	0.0	61.8
Medical	0.4	0.0	25.5	0.0	15.7	5.2	53.3
Motor Vehicles	3.2	0.0	18.2	0.3	9.5	0.9	67.9
Other Transport	0.0	0.0	6.6	0.6	10.0	0.4	82.4
Furniture	4.8	0.8	9.6	0.8	21.1	4.8	58.2
TOTAL	5.7	0.8	17.3	2.6	11.6	5.1	56.9

Source: Author's own calculations.
Region 1 represents Mediterranean, Region 2 represents Eastern Anatolia, Region 3 represents Aegean, Region 4 represents South-eastern Anatolia, Region 5 represents Central Anatolia, Region 6 represents Black Sea and Region 7 represents Marmara. Each entry of the table given above corresponds to the share of sector i at the corresponding region j, Sij. The share Sij is calculated as the ratio of total number of firms that operates in sector i at the jth region to the total number of firms that operates in sector i.

When legal status of the manufacturing firms is investigated, clear precedence is going for corporations (Figure 3.8). The share of corporations is about 64.0 percent and limited companies have a share of 31.4 percent.



Source: Author's own calculations.

Figure 3.8 Legal Status of Manufacturing Firms

As a summary, a typical Turkish manufacturing firm in this dataset is medium sized corporation located at Marmara region.

3.3.2 Structure of Production and Growth in Production

The structure of production can be examined by looking at the distribution of firms (Table 3.3) and net sales (Table 3.4) across sectors. From the data set, it can be said that Turkish manufacturing sector was dominated by producers of food, consumer non-durables (textiles and wearing apparel) and non-metallic mineral products. On average, 16.8 percent of firms are producing in food and beverages sectors and these sectors accounted for 13.9 percent of real net sales. The textile and wearing apparel sectors accounted for another 25.4 percent of firms and 16.4 percent of manufacturing real net sales. The motor vehicles and basic metals sectors can be considered as small in terms of their share in manufacturing firms (4.8 and 4.9 percent, respectively) but disproportionately large in terms of their share in manufacturing real net sales (11.0 and 11.2 percent, respectively).

Table 3.3 Sectoral Distribution of Manufacturing Firms (%)

	1990-99 Period	2000-10 Period	Full Sample	Growth (%)
Food	17.6	16.0	16.8	-8.9
Tobacco	0.3	0.3	0.3	-18.6
Textiles	14.2	16.4	15.3	15.8
Wearing	12.1	8.0	10.1	-34.3
Leather	2.0	1.7	1.9	-16.3
Wood	3.5	2.4	3.0	-33.0
Paper	2.0	2.4	2.2	16.7
Publishing	1.7	1.5	1.6	-12.1
Petroleum	0.2	0.3	0.2	67.7
Chemicals	6.1	6.5	6.3	6.4
Plastics	5.2	5.8	5.5	11.6
Non-metallic	6.1	6.7	6.4	9.7
Basic metals	4.7	5.2	4.9	12.2
Fabricated metals	5.7	5.7	5.7	0.3
Machinery	6.7	7.2	6.9	7.7
Office mach.	0.1	0.0	0.1	-52.7
Electrical machinery	2.9	3.0	2.9	1.5
Radio, TV	0.8	0.7	0.8	-21.8
Medical	0.9	0.8	0.9	-1.8
Motor Vehicles	4.2	5.3	4.8	25.5
Other Transportation	0.5	1.1	0.8	122.3
Furniture	2.3	2.9	2.6	24.7

Source: Author's own calculations.
The figures in this table represents the average proportions of the firms across sectors for the periods 1990-1999, 2000-2010 and for the full sample 1990-2010. The proportion for the ith sector at year t, pit, is calculated as the total number of firms in the ith sector at year t, Nit, divided by the total number of manufacturing firms in year t, Nt. Growth is calculated as the percentage growth of 2000-2010 average over 1990-1999 average.

$$p_{it} = {}^{N_{it}}/_{N_t}, p_i^{1990-99} = \sum_{t=1990}^{1999} {}^{p_{it}}/_{10}, \; p_i^{2000-2010} = \sum_{t=2000}^{2010} {}^{p_{it}}/_{11}, \qquad Growth_i = \left(\frac{p_i^{2000-10}}{p_i^{1990-99}} - 1\right) * 100$$

Manufacturing sector grew over the sample period and this growth was distributed somewhat unevenly among sub sectors (Table 3.4). The real net sales of manufacturing firms increased by 44.8 percent from 1990's to 2000's[12]. Office machinery and computers (352.3 percent), furniture (280 percent), other transportation (167.7 percent) and motor vehicles (152.9 percent) showed the strongest growth in the real net sales. The weakest increase observed in wearing sector with just 7.6 percent.

The share of each sector in total manufacturing according to net sales change appreciably from 1990's to 2000's which indicates existence of sectoral transformation. The largest share increase seemed to occur in office machinery and computers (173 percent), furniture (86 percent), other transportation (43.2 percent) and motor vehicles (37.1 percent). With an exception of motor vehicles sector, those sectors that showed large increase

[12]1990-99 cover the period from 1990 to 1999 and 2000-10 covers the period from 2000 to 2010.

in both real net sales and share were among the smallest sectors and large percentage increase represent only a small increase in real net sales. However the growth in motor vehicle sector is particularly striking because motor vehicle sector was already one of the largest manufacturing sectors in 1990, with 8.9 percent share in total real net sales and apart from motor vehicles all other dominant sectors' share in total real manufacturing net sales declined.

Table 3.4 Sectoral Distribution of Manufacturing Real Net Sales

	Real Net Sales (Trillion TL)				Share in Total Net Sales (%)			
	1990's	2000's	Overall	Growth (%)	1990's	2000's	Overall	Growth (%)
Food	362.2	616.0	495.1	70.1	14.4	13.5	13.9	-5.9
Tobacco	17.4	32.8	25.4	88.6	0.7	0.7	0.7	8.8
Textiles	298.2	430.0	367.2	44.2	12.0	9.8	10.8	-18.4
Wearing	164.1	176.7	170.7	7.6	6.6	4.1	5.3	-37.3
Leather	14.2	18.9	16.7	33.0	0.6	0.4	0.5	-23.7
Wood	20.6	39.7	30.6	92.5	0.8	0.9	0.8	5.0
Paper	45.9	77.0	62.2	67.8	1.8	1.7	1.8	-6.1
Publishing	28.0	36.9	32.6	31.8	1.1	0.8	0.9	-25.9
Petroleum	182.0	361.3	275.9	98.5	7.5	8.0	7.7	6.2
Chemicals	225.4	368.9	300.6	63.7	9.0	8.2	8.6	-9.1
Plastics	87.5	169.7	130.5	94.0	3.4	3.7	3.6	8.2
Non-metallic	157.0	258.4	210.1	64.6	6.3	5.7	6.0	-10.0
Basic metals	254.7	607.9	439.7	138.6	10.3	12.9	11.6	25.8
Fabr. metals	62.5	133.1	99.5	113.1	2.5	2.9	2.7	13.1
Machinery	157.1	276.8	219.8	76.2	6.3	6.0	6.2	-4.2
Office mach.	0.4	1.7	1.0	352.3	0.0	0.0	0.0	173.0
Electrical mach.	69.4	127.6	99.9	83.8	2.8	2.8	2.8	-1.2
Radio, TV	78.5	124.1	102.4	58.2	3.2	2.8	3.0	-12.2
Medical	4.7	8.4	6.6	79.1	0.2	0.2	0.2	1.2
Motor Vehicles	233.9	591.6	421.3	152.9	9.3	12.7	11.1	37.1
Other Transport	13.1	34.9	24.5	167.7	0.5	0.7	0.6	43.2
Furniture	20.6	78.4	48.0	280.0	0.8	1.4	1.1	86.0
Total	2497.3	4570.7	3580.5	44.8				

Source: Author's own calculations.

In the first panel of the table, average real net sales of the sectors are given for the period 1990-1999, 2000-2010 and for the full period 1990-2010. To convert net sales into real terms, wholesale prices index (1968=100) Istanbul Chamber of Commerce is used. At the last column of the first panel, the sectoral growth rates for the real net sales from 1990s to 2000s are presented.

The figures in the first three columns of the second panel represents the average share of the sectors' net sales for the periods 1990-1999, 2000-2010 and for the full period 1990-2010. The share of the ith sector at year t, sit, is calculated as the total net sales of the ith sector at year t, Sit, divided by the total net sales in year t, St. In the last column sectoral growth rates for the net sales are given and it is calculated as the percentage growth of 2000-2010 average over 1990-1999 average.

$$s_{it} = {}^{S_{it}}/_{S_t},\ s_i^{1990-99} = \sum_{t=1990}^{1999} {}^{s_{it}}/_{10},\ s_i^{2000-2010} = \sum_{t=2000}^{2010} {}^{s_{it}}/_{11},\ Growth_i = \left(\frac{s_i^{2000-10}}{s_i^{1990-99}} - 1\right) * 100$$

Turkey exposed to several different crises that affected whole economy deeply. In order to investigate sectoral effects of those crises annual percentage difference in the net sales is calculated. Motor vehicles (45.6 percent), radio and TV (23.8 percent), publishing (19.3 percent), wood (16.5 percent), machinery (16.1 percent), and fabricated metals (13.3 percent) sectors shrunk during the 1994 crisis. In 2001 crisis, office machinery and computers (47 percent), motor vehicles (27 percent), publishing (17.1 percent), machinery (15.3 percent), wood (14.1 percent) and paper (10.5 percent) sectors real net sales declined. Real net sales were declined in office machinery and computers (60.6 percent), wearing (19.5 percent), radio and TV (14.5 percent), leather (14.2 percent), textiles (13.5 percent) and motor vehicles (8.4 percent).

Table 3.5 Annual Percentage Change of Real Net Sales during The Crises

	1994	2001	2008
Food	4.3	-1.7	5.6
Tobacco	6.6	-12.1	5.0
Textiles	28.1	20.2	-13.5
Wearing	45.4	26.8	-19.5
Leather	11.9	9.4	-14.2
Wood	-16.5	-14.1	-9.0
Paper	18.7	-10.5	-7.0
Publishing	-19.3	-17.1	-6.1
Petroleum	5.1	-0.4	22.4
Chemicals	-1.7	4.5	3.5
Plastics	4.4	-5.8	-4.3
Non-metallic	-2.1	-1.3	-6.5
Basic metals	5.3	7.6	21.9
Fabricated metals	-13.3	-4.2	4.9
Machinery	-16.1	-15.3	-4.0
Office mach.	102.6	-47.0	-60.6
Electrical mach.	8.2	9.1	3.6
Radio, TV	-23.8	5.7	-14.5
Medical	-5.2	2.4	-8.5
Motor Vehicles	-45.6	-27.0	-8.4
Other Transport	-0.7	24.0	20.0
Furniture	10.4	3.8	-
Manufacturing	7.3	5.1	1.5

Source: Author's own calculations.

In summary, despite of chapter of crises, the Turkish manufacturing sector grow over time. The manufacturing sector's growth was accompanied by diversification away from food, textile, wearing and apparel sectors to

more technology intensive sectors such as motor vehicles, office machinery and computers, other transportations sectors.

3.3.3 Structure of Exports, Entry and Exit Behavior, and Growth in Exports

Here, the structure of exports and entry-exit behavior of Turkish manufacturing sector is going to be analyzed. Firms export status is determined according to the sales structure. Firms are classified as ***exporter if they have positive foreign sales in the given year*** and as non exporter otherwise.

In Table 3.6, the sectoral distribution of the exporters in terms of number of firms is given. According to the table given below, the number of exporting firms rose 35.8 percent from 1990s to 2000s in manufacturing sector. In 1990's, 50.7 percent of the exporting firms in the manufacturing sector were operating in wearing, textiles and food sectors whereas when comes to 2000s those dominant exporting sectors lose ground and there total share drops to 38.2 percent. The highest share lost observed in wearing sector which is about 53.2 percent. The gap emerged from wearing sector's descent engendered new exporting sectors. The strongest share increase was registered in the furniture (57.6 percent), plastics (42.8 percent), basic metals (31.7 percent), fabricated metals (26.3 percent), motor vehicles (24.5 percent), and machinery (24.3 percent)[13]. In the recent period, in addition to food, textiles and wearing sectors chemicals, machinery, plastics and motor vehicles sectors added to the dominated exporting sector list.

[13]Some sectors show even larger percentage growth rates but this is due to the very small number of firms exporting in these sectors in the initial survey year.

Table 3.6 Sectoral Distribution of Exporters (In terms of number of firms)

	1990-1999	2000-2010	Growth (%)
Food	14.5	12.7	-12.5
Tobacco	0.5	0.3	-33.5
Textiles	16.5	17.0	3.1
Wearing	19.7	9.2	-53.2
Leather	1.9	1.7	-9.7
Wood	1.4	1.8	32.0
Paper	1.8	2.5	40.3
Publishing	1.0	1.1	14.3
Petroleum	0.2	0.2	11.3
Chemicals	5.8	6.6	14.4
Plastics	4.3	6.1	42.8
Non-metallic	4.5	5.5	21.7
Basic metals	4.3	5.7	31.7
Fabricated metals	4.8	6.1	26.3
Machinery	6.3	7.8	24.3
Office mach.	0.1	0.0	-60.9
Electrical mach.	3.0	3.5	16.2
Radio, TV	1.1	0.8	-25.9
Medical	1.0	0.9	-6.4
Motor Vehicles	4.9	6.1	24.5
Other Transport	0.5	0.6	123.1
Furniture	1.9	3.0	57.6
Average Number of Exporters	2176	2955	35.8

Source: Author's own calculations.

The figures in this table represent the average share of exporters that is active in the corresponding sector for the periods 1990-1999 and 2000-2010. The share of the exporters for the i^{th} sector at year t, s_{it}, is calculated as ratio of number of exporters in the i^{th} sector at year t, EXP_{it}, divided by the total number of exporters in the manufacturing sector in year t, EXP_t. Growth is calculated as the percentage growth of 2000-2010 average, $s_i^{2000-2010}$, over 1990-1999 average, $s_i^{1990-99}$.

$$s_{it} = {}^{EXP_{it}}/_{EXP_t},\ s_i^{1990-99} = \sum_{t=1990}^{1999} {}^{s_{it}}/_{10},\qquad s_i^{2000-2010} = \sum_{t=2000}^{2010} {}^{s_{it}}/_{11},\ Growth_i = \left(\frac{s_i^{2000-10}}{s_i^{1990-99}} - 1\right) * 100$$

The sectoral distribution of exports in terms of foreign sales is shown in Table 3.7. Despite significant drop in real exports of leading exporting sectors such as food (-44.5 percent), textiles (-34.7 percent) and wearing (-59.8 percent), real manufacturing exports grew by 114.7 percent from 1990s to 2000s.

Table 3.7 also shows evidence of export diversification and structural changes over time. Wearing, food, textiles sectors exports decreased from 1990s to 2000s, but motor vehicles, furniture, machinery, fabricated metals sectors exports increased considerably. Export sales thus diversified away from 1990s' dominant exporting sectors to new sectors. Especially motor vehicles sector become a rising star of the manufacturing sector in exports.

Table 3.7 Sectoral Distribution of Exports (In terms of foreign sales)

	1990-1999	2000-2010	Growth (%)
Food	13.83	7.67	-44.5
Tobacco	1.62	0.58	-64.2
Textiles	16.93	11.06	-34.7
Wearing	18.32	7.37	-59.8
Leather	0.84	0.38	-54.4
Wood	0.21	0.30	41.9
Paper	0.68	0.74	9.3
Publishing	0.43	0.24	-45.0
Petroleum	1.91	3.66	91.4
Chemicals	5.27	4.05	-23.2
Plastics	3.06	3.48	13.8
Non-metallic	4.94	4.17	-15.5
Basic metals	13.42	16.96	26.4
Fabricated metals	1.53	2.57	68.0
Machinery	3.93	6.55	66.7
Office mach.	0.03	0.03	-5.7
Electrical mach.	2.44	3.03	24.2
Radio, TV	4.20	5.37	27.8
Medical	0.06	0.10	63.4
Motor Vehicles	5.17	19.30	273.0
Other Transport	0.67	1.22	82.2
Furniture	0.51	1.44	180.1
Real Exports (Million TL)	237.4	509.7	114.7

Source: Author's own calculations.

In this table, average real net sales of the sectors are given for the periods 1990-1999 and 2000-2010. At the last column, the sectoral growth rates for the real net sales from 1990s to 2000s are given.

To convert nominal export figures into real terms, wholesale prices index (1968=100) Istanbul Chamber of Commerce is used. The share of the ith sector at year t, sexpit, is calculated as the total real exports of the ith sector at year t, EXPit, divided by the total real exports in year t, EXPt. In the last column sectoral growth rates are calculated as the percentage growth of 2000-2010 average over 1990-1999 average.

$$sexp_{it} = {EXP_{it}}/{EXP_t},\ sexp_i^{1990-99} = \sum_{t=1990}^{1999} {sexp_{it}}/{10},\ sexp_i^{2000-2010} = \sum_{t=2000}^{2010} {sexp_{it}}/{11},\ Growth_i = \left(\frac{sexp_i^{2000-10}}{sexp_i^{1990-99}} - 1\right) * 100$$

As it was mentioned in the previous subsection, the manufacturing sector's growth was accompanied by diversification away from low-technology sectors such as food, textile, wearing and apparel to more technology intensive sectors such as motor vehicles, office machinery and computers, other transportations sectors. Same diversification observed in exports. Hence, it can be said that growth of the sectors such as motor vehicles, machinery, electrical machines are fuelled by exports.

The importance of the export market relative to the domestic market can be measured by the proportion of firms that export and the proportion of exports in total sales. Table 3.8 shows the percentage of exporters in each sector. The proportion of exporters seems to be considerably high for the sample. The focus on exporting was most intense in tobacco sector in which on average 93.2 percent of firms exported some portion of their products.

Wearing, radio and TV, motor vehicles and electrical machinery sectors also had substantial proportion of exporters.

Table 3.8 Export Intensity: Percentage of Exporters in Each Sector

	1990-1999	2000-2010	Overall	Growth (%)
Food	42.8	58.1	50.5	42.3
Tobacco	87.3	88.6	92.8	19.0
Textiles	59.7	69.8	69.3	33.5
Wearing	80.3	75.6	82.0	8.6
Leather	49.1	69.0	61.1	54.1
Wood	21.9	71.9	36.4	178.5
Paper	47.5	77.9	65.0	73.9
Publishing	30.4	60.4	42.4	95.6
Petroleum	46.6	54.1	52.7	29.8
Chemicals	49.6	73.6	63.3	58.2
Plastics	43.6	77.9	62.5	85.8
Non-metallic	37.8	59.5	49.9	62.8
Basic metals	48.2	78.5	65.6	72.1
Fabricated metals	45.2	77.5	61.9	80.6
Machinery	49.4	79.4	66.5	71.9
Office mach.	52.5	77.0	60.9	78.1
Electrical mach.	53.9	84.2	71.0	69.4
Radio, TV	65.6	86.6	76.6	42.8
Medical	57.5	79.4	70.6	53.7
Motor Vehicles	59.7	78.1	75.0	47.4
Other Transport	47.0	71.2	66.2	56.4
Furniture	43.4	74.9	63.1	78.7
Total	51.6	73.9	63.2	47.6

Source: Author's own calculations.

Percentage of exporters in the ith sector at year t, pit, is calculated as the ratio of total number of exporters in the ith sector at year t, N_{it}^{exp}, to the total number of firms in the ith sector at year t, Nit. Then, the averages of these percentages for the periods 1990-1999, 2000-2010 and 1990-2010 are calculated and given in the second through fourth columns of the table. The growth rates of the exporter shares are calculated as the percentage growth of 2000-2010 average over 1990-1999 average.

$$p_{it} = \frac{N_{it}^{exp}}{N_{it}}, \quad p_i^{1990-1999} = \Sigma_{t=1990}^{1999} p_{it} / 10, \quad p_i^{2000-2010} = \Sigma_{t=2000}^{2010} p_{it} / 11$$

$$Growth_i = \left(\frac{p_i^{2000-2010}}{p_i^{1990-1999}} - 1 \right) * 100$$

Table 3.9 shows the average share of the exports in total sales for the periods 1990-1999, 2000-2010 and full sample (1990-2010) and the corresponding growth rates are given for each sector. Overall, the share of exports in total sales grew from 18.5 percent in 1990s to 29.4 percent in 2000s. This increase is fuelled by the petroleum and motor vehicles sectors that stand out with conspicuous export performance. The export sales share increased from 2.5 percent to 13.7 percent in petroleum sector and increased from 12.4 percent to 47.3 percent in motor vehicles. Other transportations, radio-TV, electrical machinery, machinery and equipment

and basic metals sectors exported a large and growing percentage of their output.

Table 3.9 Export Intensity: Percentage of Nominal Output that is Exported

	1990-1999	2000-2010	Growth (%)
Food	18.5	16.3	-11.7
Tobacco	38.4	8.1	-79.0
Textiles	28.5	34.4	20.7
Wearing	53.9	54.0	0.1
Leather	28.7	27.5	-4.3
Wood	5.4	10.8	97.8
Paper	7.4	13.1	76.8
Publishing	5.3	8.1	52.2
Petroleum	2.5	13.7	439.7
Chemicals	11.0	13.9	25.7
Plastics	17.2	28.0	63.1
Non-metallic minerals	14.9	22.3	50.1
Basic metals	26.5	41.3	56.0
Fabricated metals	11.9	28.1	136.3
Machinery	13.0	33.7	158.9
Office mach.	45.7	14.6	-68.1
Electrical mach.	17.3	33.2	91.7
Radio, TV	27.6	60.5	118.8
Medical	6.8	17.3	154.8
Motor Vehicles	12.4	47.3	282.1
Other Transport	29.0	52.4	80.5
Furniture	12.8	25.9	102.6
Total	18.5	29.4	58.9

Source: Author's own calculations.

The average export shares for each sector given above are calculated as follows: Letting $sexp_{it}$ denotes the total value of exports for the ith sector at year t and $sale_{it}$ denotes total sales for sector i at year t, then export share of each sector at year t, $\exp share_{it} = {sexp_{it}}/{sale_{it}}$. Averages of export shares for the periods 1990-1999 and 2000-2010 are calculated just by simple arithmetic means as follows:

$$p_i^{1990-1999} = {\sum_{t=1990}^{1999} expshare_{it}}/{10}, \qquad p_i^{2000-2010} = {\sum_{t=2000}^{2010} expshare_{it}}/{11}$$

The growth rates given in the last column of the table is calculated as:

$$Growth_i = \left(\frac{p_i^{2000-2010}}{p_i^{1990-1999}} - 1\right) * 100$$

In summary, manufacturing sector increased its export orientation over time. Although wearing and textiles sectors declined in importance, these sectors remained an important source of export revenues. In 1990s exports was in the possession of food, textiles and wearing sectors. However, the sectoral structure of exports diversified and in 2000s together with food, textiles and wearing, motor vehicles, chemicals, basic and fabricated metal sectors became export market actors for the Turkish manufacturing sector.

3.3.4 Choice of Market and Market Switching

A manufacturing firm has to make three important decisions. The first one is the production decision, that is to say decide whether or not to produce in a given sector. If she decides to produce then has to decide whether to serve the domestic market, the export market or both. Then if firms choose to serve for both markets they have to decide on how to distribute production between the markets. In Table 3.10, distribution of firms by market served across sectors is given. On average, for 1990-2010 periods, 36.8 percent of the manufacturing firms serve domestic market only and only 0.6 percent of total serves to export markets only. Wood, publishing, non-metallic minerals, petroleum, and food sectors can be classified as domestic market oriented sectors since more than half of the firms that operate in those sectors serve only to domestic market. Tobacco, wearing, radio-TV and motor vehicles sectors are among the most export market oriented sectors.

Table 3.10 Distributions of Firms by Market Served (Mean %)

	Domestic Market Only	Export Markets Only	Both Markets
Food	49.5	0.5	50.0
Tobacco	7.2	7.6	85.2
Textiles	30.6	0.4	69.0
Wearing	17.9	2.3	79.8
Leather	38.7	0.4	61.0
Wood	63.5	0.1	36.4
Paper	35.0	0.0	65.0
Publishing	57.6	0.2	42.2
Petroleum	47.3	0.0	52.7
Chemicals	36.7	0.2	63.2
Plastics	37.5	0.3	62.2
Non-metallic	50.1	0.2	49.8
Basic metals	34.4	0.1	65.4
Fabricated metals	38.0	0.3	61.7
Machinery	33.5	0.4	66.2
Office mach.	39.1	0.0	60.9
Electrical mach.	29.0	0.7	70.3
Radio, TV	23.2	0.2	76.6
Medical	29.4	0.3	70.3
Motor Vehicles	25.0	0.2	74.8
Other Transport	33.6	2.0	64.4
Furniture	36.9	0.2	62.9
Total	36.8	0.6	62.7

Source: Author's own calculations.

Despite low number of firms that serves to export market only, real net sales is disproportionably higher. In Figure 3.9, real net sales according the type of the market that firm serve is given. It is observed that during 1994 economic crisis, the real net sales for the firms that serve to export market only increased markedly. For 2008-2009 economic crisis, the average real net sales of the firms that serve to export market only showed considerable decline.

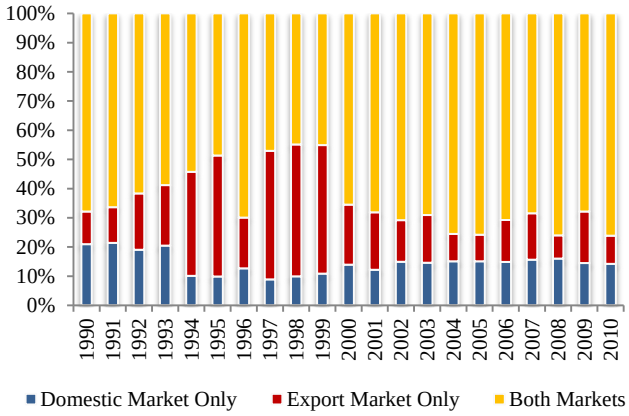


Figure 3.9 Average Real Net Sales

Table 3.11 reports the transitions of firms between markets in consecutive years. On average, 80.2 percent of the firms that produce only for the domestic market in one year continued to serve domestic market in the next year and 92.1 percent of the firms that serve for both markets continue to preserve their markets for the next year. The most binding domestic market producers were in food and non-metallic minerals sector. Firms that exported all their products in one year were more likely to serve both markets simultaneously. Sectoral differences observed in the transition properties of the firms. Tobacco and wearing are the two sectors in which the mobility is high. The rigidity in the choice of markets is consistent with the idea that entry costs prevent firms from smoothly moving between markets in response to changing market conditions.

Table 3.11 Market Transition, TURKEY

Market in year t-1	Domestic Only			Both			Export Only		
Market in year t	Domestic Only	Both	Export Only	Domestic Only	Both	Export Only	Domestic Only	Both	Export Only
Food	87.5	12.3	0.2	8.0	91.6	0.4	18.5	46.2	35.4
Tobacco	40.0	45.0	15.0	1.7	96.1	2.3	10.0	50.0	40.0
Textiles	75.6	24.2	0.2	7.5	92.4	0.2	20.4	50.0	29.6
Wearing	59.4	38.2	2.4	6.2	92.8	1.0	14.8	47.4	37.8
Leather	77.9	21.7	0.4	9.3	90.5	0.1	25.0	75.0	0.0
Wood	89.1	10.9	0.0	13.3	86.6	0.1	0.0	100.0	0.0
Paper	77.2	22.8	0.0	7.7	92.3	0.0	0.0	0.0	0.0
Publishing	85.8	14.2	0.0	14.3	85.3	0.4	100.0	0.0	0.0
Petroleum	86.5	13.5	0.0	7.5	92.6	0.0	0.0	0.0	0.0
Chemicals	78.3	21.5	0.2	8.8	91.1	0.1	22.2	44.4	33.3
Plastics	80.5	19.2	0.3	6.5	93.5	0.0	33.3	0.0	66.7
Non-metallic	87.0	12.9	0.1	9.1	90.9	0.1	25.0	50.0	25.0
Basic metals	79.8	20.2	0.0	6.8	93.1	0.1	0.0	83.3	16.7
Fabricated metals	79.7	20.2	0.2	7.9	92.0	0.1	14.3	42.9	42.9
Machinery	75.6	24.3	0.1	8.3	91.7	0.0	19.1	23.8	57.1
Office mach.	82.4	17.7	0.0	4.2	95.8	0.0	0.0	0.0	0.0
Electrical mach.	72.4	27.3	0.3	7.0	93.0	0.0	23.5	23.5	52.9
Radio, TV	74.8	25.2	0.0	5.6	94.2	0.2	0.0	0.0	0.0
Medical	62.4	37.6	0.0	11.7	88.1	0.2	0.0	0.0	100.0
Motor Vehicles	75.3	24.7	0.0	4.7	95.3	0.1	0.0	50.0	50.0
Other Transport	72.1	26.5	1.4	8.6	90.9	0.6	25.0	16.7	58.3
Furniture	78.3	21.7	0.0	8.1	91.9	0.1	40.0	20.0	40.0
Total	80.2	19.5	0.3	7.6	92.1	0.3	17.6	44.2	38.2

Source: Author's own calculations.
Cell entries are the percentages of firms that produce for the market indicated in year t-1 that move to the market indicated in year t.

3.4 Conclusion

Accessibility, consistency and lengthy coverage of CBRT Company Accounts data set influenced the decision about the selection of dataset. Descriptive statistics concerning the size of the firms betray one of the main advantages of this selected data set. The data set does not contain bulk of identical firms. Small even micro firms take place together with medium and large firms.

Descriptive analysis of the data set reveals some important empirical facts and evidences. On average the manufacturing firms are observed to be medium-sized corporations. Regional dispersion of manufacturing firms is found to be low for most of the sectors and Marmara is the most preferred region by the manufacturers. Sectoral distribution of the firms and net sales show that Turkish manufacturing sector dominated by food,

consumer non-durable (food, textiles and wearing apparels) and non-metallic mineral producers. Real net sales developments over time provide evidence for the sectoral transformation, production diversify from low-technological intensity sectors such as food, textile and wearing apparels sector to more technological-intensive sectors like motor vehicles, office machinery and computers and other transportation sectors. When share of exporting firms is considered, on average 62.7 percent of the manufacturing firms sell some portion of their output in international markets. Similar sectoral transition observed in exports over time. In 1990s, while the leading exporting sectors are limited with textiles, wearing and food, in 2000s motor vehicles, chemicals, basic and fabricated metal sectors become export market actors for the Turkish manufacturing sector. Another important empirical evidence emerge from descriptive analysis is that transition of the firms between domestic and foreign markets shows existence of high rigidity in the choice of markets.

This last observation about the persistence of the market choice constitutes the prerequisite for this thesis. The extensive heterogeneous firm trade literature has been developed based on this simple but important observation. Observed persistent market choice structure in our data set indicates the worth of further investigation of this topic.

CHAPTER 4
VARIABLES

VARIABLES

Various numbers of different firm characteristics can be thought to be important for the exporting behavior of the firms. Previous empirical studies make things smooth for us and some basic factors for the exporting behavior are determined. However, it is notably important to note that in the existing literature, it is possible to encounter different definitions for the same measure. This is mainly due to the availability of different variables provided by different data sets. In this thesis, based on the availability of the data the selection of the variables are in line with the empirical literature.

4.1 Dependent Variables

In this thesis, a wide range of econometric techniques has been employed which requires different types of dependent variables:

- In modeling the exporting propensity of the firms, the dependent variable is a dummy variable that shows the export status of the firms. The dependent variable takes the value of 1 if the firm is exporter and takes the value of 0 if it is non-exporter. Exporters and non exporters are determined according the sales structure. Firms are classified as exporter if they have positive foreign sales and as non exporter otherwise. Alternative to this definition, a nonzero threshold as in Aw and Hwang (1995)[14] can be used in determining the firms export status. However, using nonzero threshold in the classification of the exporting firms is believed to be objectionable.

[14] In Aw and Hwang (1995), a firm is defined as exporter if the export share in total firm sales exceeds 25%.

Hence, in line with the majority of the previous studies, in modeling the export propensity, the dependent variable is defined as a dummy variable that takes the value of 1 if the firm is exporter more precisely if it has positive foreign sales and zero otherwise.

- In modeling the export volume of the firms, the dependent variable is defined as the logarithm of the foreign sales (exports).
- In the duration analysis, the aim is to analyze both entry and exit dynamics of the firms so that two dependent variables are defined correspondingly. For modeling the entry dynamics the concern is the determinants of time to become exporters and the dependent variable is the number of years the firm stayed as non-exporter. In exit model, the survival in export markets is examined and the dependent variable is defined as the time passed in the export markets.

4.2 Independent Variables

When it comes to the independent variables, in order to attain coherence and to maintain unity, same set of independent variables are used for all models. Selection of the independent variables is based on the previous empirical literature. Pioneers of this literature, Bernard and Jensen, use variables showing the size, productivity, labor force characteristics (to proxy quality of the products) and ownership structure in the baseline specification. This setting has been used by many researchers. Broadly, our independent variable selection corresponds to this setting also. Wide empirical literature provides the expected predictions about the constructed independent variables. The considered variables along with their predictions are given as follows:

4.2.1 Efficiency Measures

There is general consensus on the self-selection of the exporters in trade literature. Better firms become exporter is the first and foremost finding of all empirical studies in this literature. Therefore, we expect to

have positive relationship between the efficiency measures and export behavior of the firms.

In the heterogeneous firm trade literature, the positive impact of firm size on export probability has been identified completely. Theoretical foundation of this relation is the existence of fixed entry-costs in export markets which introduces the self-selection of better firms into export markets. Larger firms are usually considered as having better performance since they have access to finance and due to economies of scale they can charge lower price and earn more profits. Accordingly, for large firms it is more likely to become exporter. For this reason, positive relation between firm size and export behavior is expected. Here, we use total number of employees in measuring the size of the firm and as an efficiency indictor.

Productivity of the firms is considered another measure of success and again positive relation is expected. In the empirical literature, different alternative productivity measures have been used within the framework of the dataset. Among them the most popular ones are total factor productivity (TFP), value added per worker and net sales per worker. The choice of the productivity measure depends mainly on the availability of the required data. Since our data set do not contain neither capital stocks nor value-added, partial labor productivity measured by real net sales per employee is used. To convert net sales into real terms, wholesale prices index (1968=100) Istanbul Chamber of Commerce is used.

Larger and more productive firms are expected to be more profitable and hence profitability is considered as another indicator for the efficiency of the firms. Different measures for profitability are encountered in the literature. We define firms' profitability as the ratio of operating profit to net sales due to the minimum number of missing values that is obtained with this definition.

4.2.2 Quality Measures

Quality is considered as an important prerequisite in exports. It is presumed that export markets require higher quality products. Producing those high quality products requires skilled workers, technology and

capital. Bernard and Jensen envisaged that qualified labor force put out high quality products that are more likely to be exported. Thus, it is expected the quality of the workforce to be positively correlated with the exporting activity. To embody labor quality they proposed different measures such as wages (average wage, production wage, non-production wage) and distribution of the labor force (share of white-collar, share of production workers and share of non-production workers). Our data set as mentioned before contains mainly information related with the financial status of the firms. Due to the limitation of the data set, we cannot construct any measures for labor quality such as wages or share of white-collars. Instead, alternative measures are constructed for measuring the quality.

Technology usage and innovation is one of the main requirements for obtaining quality production. Relationship between technology usage and export performance of the firms has been analyzed by many researchers[15]. The conclusion driven from those studies is that there is positive relation between innovation and export performance of the firms. The reasoning behind this finding is that exporting firm has to improve the quality of the products with lower costs. In order to achieve this goal, they have to invest to technology. Hence, R&D expenditures (proxy for innovation) are expected to affect the export performance of the firms positively. In our analysis, the ratio of R&D expenditures to the operating expenses is used as a proxy for the technology usage.

However, not all firms especially small and medium sized firms invest to R&D; instead they prefer to import technology by the machinery that they use. Therefore, capital can be considered as another input for quality production and it is used in explaining the exporting behavior of the firms. We defined capital intensity of the firms as real tangible assets per worker. To convert tangible assets into real terms, wholesale prices index (1968=100) Istanbul Chamber of Commerce is used. When it is considered as a measure of quality production, positive impact is expected. However, in several empirical studies, conducted for low-income countries (see Kumar

[15] Some of the studies are Wakelin (1998), Kumar and Siddarthan (1994) and Alvarez (2001).

and Siddharthan (1994) for India, Srinivasan and Archana (2009) for India, Hiep and Nishijima (2009) for Vietnam and Ma, Tang and Zhang (2011) for China) negative relation between capital intensity and exporting behavior is obtained. The main argument for negative association between capital intensity and export is that higher capital intensity operation is unlikely to give the firm a comparative advantage in a developing country with labor abundance and relative scarcity of capital. For example, Ma, Tang and Zhang (2011) found that within a narrow industry, exporters are less capital-intensive than non-exporters in China. They rationalized this opposite pattern in capital intensity by China's to be low-wage country and labor abundance which leads exporters to be more labor-intensive for reducing the cost share of capital. Kumar and Siddharthan (1994) using Indian manufacturing firm data concluded that while higher degree of capital intensity of operations (or automation) does not give a comparative advantage to exporting firms in low and medium technology industries, it is desirable for breaking into export markets in high technology industries. They explained this as in low and medium technology industries firms employing labor intensive processes have an edge over those with more automated production because of low wages. In the high-tech sectors labor intensive processes appear to be inefficient despite low wages. Negative relation between capital intensity and export behavior is not surprising finding for Turkey with low-wage and labor abundance. Therefore, currently to make prediction about the sign of the capital intensity variable is not possible.

According to the advertising and vertical product differentiation literatures, firms can attract consumer's attention and increase their willingness to pay for their products by investing to marketing, advertising and R&D. Those types of investments provide non-price competition (known as quality competition) power to the firms and they can forestall the competitors by charging higher prices. In the industrial organization literature, Sutton (1991) has named those expenditures made for increasing firm's quality competition as ***endogenous sunk-costs***. He argued that these costs are also fixed and sunk however they can be determined

endogenously by the firms, unlike the sunk-costs in the trade hysteresis literature or in the heterogeneous firm trade literature in which they are assumed to be exogenous. In the very recent period, endogenous sunk costs have been started to be considered in the theoretical models. However, impact of endogenous sunk-costs on export decision has not been tested empirically yet. Here, in order to investigate the possible impact of the endogenous sunk-cost we introduced the variable called marketing. Quality competition power or in other words endogenous sunk-costs of the firms is measured as the ratio of marketing, advertisement and distribution expenditures to the operating expenses.

4.2.3 Financial Health Measures

As it was mentioned in the literature survey chapter, empirical studies found evidences supporting that exporters are less credit constrained compared to non exporters. Hence, we would to expect to have negative relation between the severity of the credit constraints and export activity. It is possible to encounter with many different definitions for the terminology of liquidity constraint. Hence, we need to start by explaining what is meant by the term liquidity constrained firm. A firm is said to be liquidity constrained if it incurs difficulties to cover fixed costs for investments (including exports) due to either the scarce internal resources or difficulties in accessing to external financing means. In order to comprise the liquidity conditions of the firms, two different variables are used.

The first variable is relevant with the internal resources of the firms. In empirical literature when speaking of the internal resources firm's cash flow is used in general, however since our data set does not contain information about cash-flow, alternative measure is preferred. We prefer to use the liquidity ratio that is defined as short-term trade receivables over total assets. This ratio is assumed to be showing how well a firm is positioned to meet any future short-term obligations and this measure can be regarded as a proxy for *accessibility of the internal resources.* Positive relation with the export propensity is expected. However note that, trade receivables are categorized into two as notes and accounts receivables.

Accounts receivables may contain credit sales and there is always a risk for those credit sales to turn into uncollectable receivables. High level of liquidity due to high rate of credit sales can put firm to inconvenience and can have adverse effect on the export propensity. Especially, for the case of non-exporters that are planning to enter into export markets can hesitate to take action and prefer to postpone entry.

The second variable is constructed to show firm's ability to access external resources. For most of the firm, credits from financial sector are the main source of finance. However not all firms are able to raise external financing at the same amount and with the same cost. The credit constraint variable is defined as the ratio of bank loans to total liabilities. Inability to find credit from financial sector to finance liabilities is considered as the severity of credit constraints for the firms. The constructed measure shows the borrowing power of the firms and the ratio varies between zero and one. As the ratio approaches to zero, it shows the severity of the credit constraint.

4.3 Macroeconomic Variables

In addition to the firm specific variables, in this literature, time dummies are included in the analysis in order to capture business cycle effects. Roberts and Tybout (1997), Bernard and Jensen (2004), Bernard and Wagner (1998) use time dummies as macroeconomic variables, Campa (2000) includes real exchange rate as a separate variable in order to investigate the effect of exchange rate. Bugamelli and Infante (2003) uses real exchange rate, domestic and foreign demand separately as macroeconomic variables in place of time dummies. In order to investigate the effects of those macroeconomic variables following Bugamelli and Infante (2003), we include real exchange rate, domestic and foreign demand separately as macroeconomic variables.

The real exchange rate is chosen for measuring the price competitiveness of the Turkish products on export markets. The source of this data is CBRT. CPI based real effective exchange rate index calculated

using the IMF weights for 19 countries including Germany, USA, Italy, France, United Kingdom, Japan, Netherlands, Belgium, Switzerland, Austria, Spain, Canada, Korea, Sweden, Taiwan, Iran, Brazil, China and Greece. Its base year is 1995 and an increase in the index denotes an appreciation. It is expected to negatively affect the exporting activity of the firms since increase in the index shows the appreciation. More precisely, export is higher in years of real depreciation of Turkish Lira (decrease of the index).

In order to capture foreign demand for the Turkish manufacturing goods, world demand index is constructed. Turkey's trade partners import volume indices are weighted by the export shares.

$$wd = \sum_{i=1}^{k} M_i . Export_i^{share}$$

$$\text{Export}_\text{i}^{\text{share}} = \left(\frac{\text{Export}_\text{i}}{\text{Total Exports}}\right) \quad \textbf{(6)}$$

where i denote the ith trade partner of Turkey and $Export_i$ denote the Turkey's exports to country i. The index's base year is 1995. This variable is expected to have positive effect on the exporting behavior of the Turkish manufacturing firms since as foreign demand conditions get better exporting possibilities increases.

Domestic demand is also included to the models. Domestic demand measured as the private consumption derived from national accounts with 1998 prices. The base year of the constructed domestic demand index was changed to 1995. Conflicting ideas about the direction of the relation between domestic demand and exporting are available in the literature. A part of researchers believe that exporting and domestic demand are positively correlated, others believe that the relationship is negatively correlated. Negative relationship between exporting and domestic demand conditions supports the hypothesis that firms sell abroad especially when demand is scant in domestic market.

Domestic demand, foreign demand and real exchange rate can be augmented into a single variable named as relative demand. Relative demand, rdem, is calculated as:

$$\mathrm{rdem}_t = {}^{\mathrm{dd}_t}/_{\mathrm{wd}_t} \qquad \textbf{(7)}$$

Relative demand variable contains both demand and relative price information.

4.3.1 Dummy Variables

The empirical literature generally confirms the importance of technology in explaining the export performance. Like all developing countries, increasing the share of medium and high-tech exports is crucial for Turkey. Export market share of Turkish low-tech products has been threatening with the integration of tough competitors, China and India, into world markets. As it can be observed from Table 4.1, the structural transformation in Turkish manufacturing sector is obvious.

Table 4.1 Manufacturing Sector Export Structure (percentage share)

Technological Intensity (1)	2002	2008
High	6.2	21.6
Medium-high	24.3	41.1
Medium-low	22.8	19.1
Low	46.8	18.3

Source: SPO 2010 Annual Program
(1) Based on OECD classification

In order to investigate the sectoral differences, instead of using sector dummies according to NACE Rev. 1.1, sectors according to technological intensity are considered. Breakdown of manufacturing industry according to technological intensity is based on OECD. The corresponding breakdowns of the sectors are given in Table 4.2.

In order to investigate the export behavior differences of different firm size groups instead of using logarithm of the number of employment, size dummies are used in some of the models. Size classification of the firms is done according to the standards designated by Euro Stat and used officially for the definition of small and medium sized enterprises according to the regulation came into force on 18 May 2006 in Turkey. Firms are classified as micro if their 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 lastly as large if the total number of employees exceeds 249. Then for each of the four size categories dummy variables are constructed.

Table 4.2 summarizes the constructed variables with their definitions and expected signs if applicable.

Table 4.2 Variables and Their Definitions

Variables	Description	Expected Sign
Efficiency Measures		
Size	$\text{Size} = \log(\text{Number of Employee})$	+
Labor Productivity	$\text{Productivity} = \left(\frac{\text{Net Sales}}{\text{p} * \text{Number of employee}}\right)$	+
Profitability	$\text{Profitability} = \left(\frac{\text{Operating Profits}}{\text{Net Sales}}\right)$	+
Quality Measures		
Technology usage	$\text{R\&}D = \left(\frac{\text{R\&}D\ Expenses}{\text{Operating Expenses}}\right)$	+
Marketing Expenses	$\text{Quality} = \left(\frac{\text{Marketing, Advertising and Distribution Expenses}}{\text{Operating Expenses}}\right)$	+
Capital Intensity	$\text{Capital} = \left(\frac{\text{Tangible Assets}}{\text{p}*\text{Number of employee}}\right)$	+/-
Financial Measures		
Credit Constraints	$\text{Credit Constraint} = \left(\frac{\text{Total Financial Liabilities}}{\text{Total Liabilities}}\right)$	+
Liquidity	$\text{Liquidity} = \left(\frac{\text{Short} - \text{term Receivables}}{\text{Total Assets}}\right)$	+

Note: p denotes wholesale prices index (1968=100) Istanbul Chamber of Commerce

Table 4.2 (continued)

Macroeconomic Variables		
World Demand	$wd = \sum_{t=1}^{k} M_t Export_t^{share}$ $Export_t^{Share} = \left(\frac{Export_t}{Total\ Exports}\right)$	+
Domestic Demand	Private consumption derived from national accounts with 1998 prices	+ / -
Real Exchange Rate	CPI based real effective exchange rate index calculated using the IMF weights for 19 countries including Germany, USA, Italy, France, United Kingdom, Japan, Netherlands, Belgium, Switzerland, Austria, Spain, Canada, Korea, Sweden, Taiwan, Iran, Brazil, China and Greece.	-
Relative Demand	$rdem_t = {dd_t}/{wd_t}$	+ / -
.**Dummy Variables**		
Industry Dummies According to Technology[16]		
Low Technology	Dummy variable that takes value of 1 if the firm belongs to a low-technological intensity industry (Other manufacturing and recycling, wood, pulp, paper product, printing and publishing, food, beverage and tobacco, textiles and clothing) and 0 otherwise.	
Medium-Low Technology	Dummy variable that takes value 1 if the firm belongs to a medium-low-technological intensity industry (coke, refined petroleum products and nuclear fuel, rubber and plastic, non-metallic mineral products, shipbuilding, basic metals, fabricated metal products)	
Medium-High Technology	Dummy variable that takes value 1 if the firms belong to a medium-high-technological intensity industry (chemicals, excluding pharmaceuticals, electrical machinery, motor vehicles, other transport equipment, non-electrical machinery) and 0 otherwise.	
High Technology	Dummy variable that takes value 1 if the firms belong to a high-technological intensity industry (aerospace, pharmaceuticals, computers, office machinery, electronics-communications, scientific instruments) and 0 otherwise.	
Year dummies	Dummy variables that take value of 1 for the corresponding year and 0 otherwise.	

[16] Breakdown of manufacturing industry according to global technological intensity is based on EUROSTAT and OECD. Source: Euro Stat, Statistics in Focus, Science and Technology, 4/2005, R&D Statistics, Luxembourg, 2005.

CHAPTER 5

EXPORT BEHAVIOR OF THE TURKISH MANUFACTURING FIRMS

EXPORT BEHAVIOR OF THE TURKISH MANUFACTURING FIRMS

In this chapter, main features of the exporting behaviors of the Turkish manufacturing firms are going to be identified by exploiting a wide range of approaches used in the empirical literature. To our knowledge, there has not been any such a detailed analysis for any country in this literature. This is considered as one of the main contribution of this thesis.

The empirical literature in this field started with the investigation of productivity differences of exporters and non exporters. Conclusion from numerous studies is comparatively clear; exporters possess better performance compared with the firms that produce only for domestic markets. An incentive to find mainspring of this common finding throw up a window to a new strand of theory. Self-selection and learning-by-exporting are two hypotheses that were proposed for explaining the superiority of the exporters. Commonly, empirical studies suggested that exporters are better, and that better firms self-select into export markets, while exporting does not necessarily improve firm performance. Predominant evidences in favor of self-selection of the exporting firms brought to mind the presence of additional costs in export market entrance so that only “good” firms that can afford those additional costs can become exporter. This was hypothesized as existence of sunk-cost and propositions derived from hysteresis literature were used to test its validity empirically. Empirical studies concluded that there are high-sunk costs.

Existence of sunk-costs implies the importance of the timing decision of the firms. Dixit-type model shows that in the existence of sunk-costs, firms export decision is considered as forward looking problem. Both theoretical and empirical models reveal the fact that in the existence of sunk-costs, some firms choose to absorb adverse effects of though periods and remains in the export markets in order to avoid paying re-entry costs.

On the other hand, non-exporters have opportunity to wait until better or improved conditions attained for considering becoming exporters but they have to make an important decision about the appropriate timing for entrance into export markets. Although limited, in the recent period, exporting behavior of the firms started to be analyzed within the survival framework.

Consistent with the order of the literature, firstly, performance differences are studied by comparing exporters and non exporters in different selected performance measures via simple descriptive and regression analysis. Then self-selection and learning by exporting hypotheses are tested. Existence of sunk-cost is tested using dynamic discrete choice model and lastly in order to reveal the determinants of the waiting time of becoming exporter and survival in export markets, duration analysis is employed.

5.1 Export Premium

We start with the simplest but an important question. Are the common findings about the superiority of exporters for many different countries valid for Turkish manufacturing firms? To give answer to this question, first, the performance differences between exporters and non exporters are investigated through simple descriptive analysis. For this purpose efficiency indicators (including size, labor productivity and profitability), quality indicators (R&D, marketing and advertisement expenditures and capital intensity) and financial condition indicators (credit constraint and liquidity) are chosen as the main performance measures[17].

Then more technical approach is followed and exporter premia are calculated for the selected performance measures following Bernard and Jensen (1995).

[17] Detailed description of the corresponding variables are given in Chapter 4.

5.1.1 Descriptive Statistics

Before going into detailed analysis, as a first step some preliminary graphical comparisons of exporters and non exporters are carried out. Figure 5.1 through Figure 5.8, give the means of the selected performance measures by the export status of the firms over the period 1989-2010.

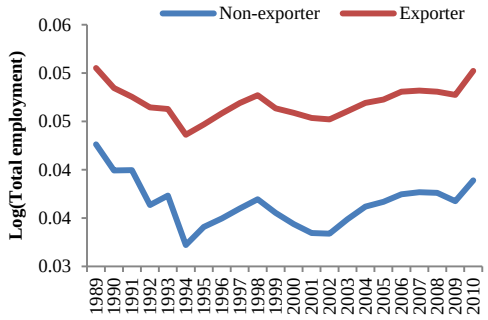


Figure 5.1 Size by Total Employment

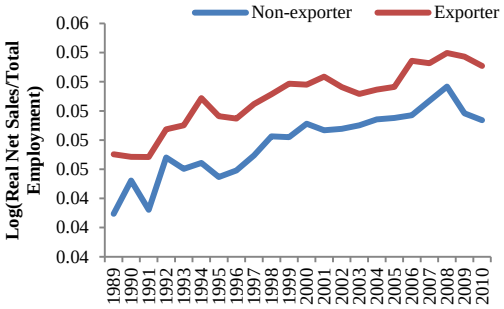


Figure 5.2 Productivity*

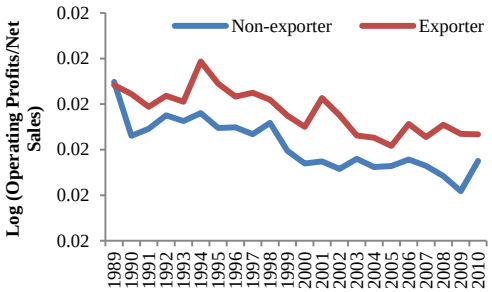


Figure 5.3 Profitability**

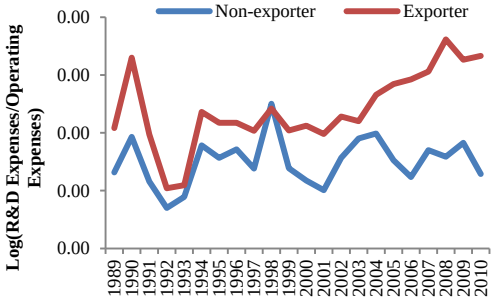


Figure 5.4 Technology Usage

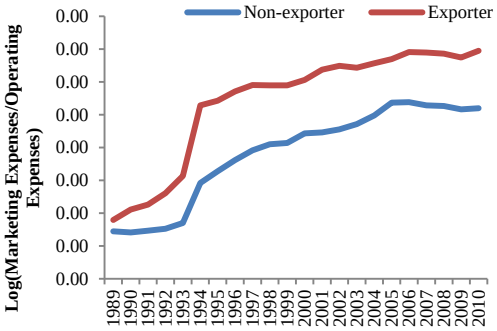


Figure 5.5 Marketing Expenses

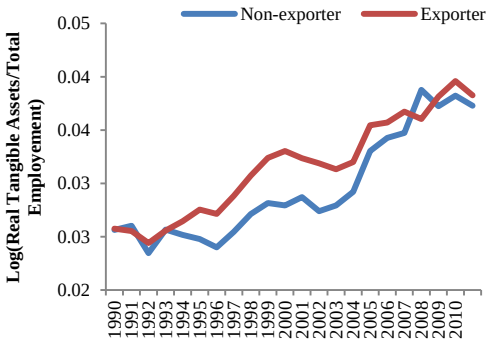


Figure 5.6 Capital Intensity*

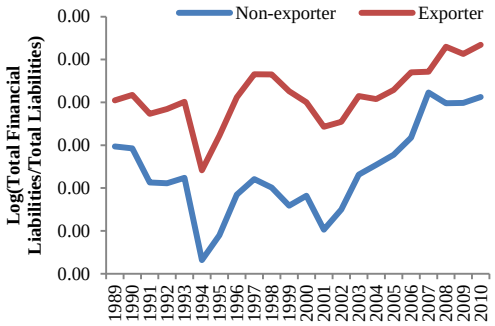


Figure 5.7 Credit Constraints

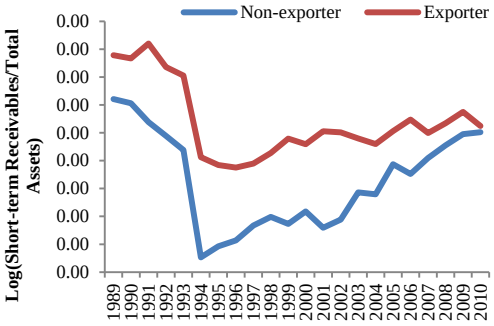


Figure 5.8 Liquidity

Source: Author's own calculations.
* To convert net sales and tangible assets into real terms, wholesale prices index (1968=100) Istanbul Chamber of Commerce is used.
** Due to the ease of follow, profitability of the firms is rescaled by adding the minimum profit value to each observation. This rescaling enables to take the logarithm of the measure which provides convenient presentation.

Graphical investigation reveals that exporters are more efficient than non exporters. More precisely, exporters are larger, more productive and more profitable compared to non-exporters. On average employment, productivity and profitability levels for the exporting firms remain above that of non-exporters. When quality measures are considered, that is to say R&D and marketing expenses and capital intensity of the firms, again

superiority of the exporters is obvious. For R&D expenses, differentiation between exporters and non-exporters has become more evident since 2004. Intuitively, this pattern can be the result of the new regulations made in the legal incentive for R&D activity that was put in force in 2004[18]. As it was mentioned in Chapter 4, marketing expenses variable shows the endogenous sunk-costs of the firms. As mentioned before, firms with higher productivity are willing to spend more on such investment since their marginal benefits is higher. Moreover, exporters receive additional marginal benefits from those investments when compared with non-exporters; hence observing higher endogenous sunk costs for the exporters is evident. As expected, exporting firms seem to have stronger financial structure. For exporters both internal and external financing seems to be easier. Although for the last few years, liquidity difference between exporters and non exporters vanishes, still exporters have better position. Underlying causes for observed higher external resource availability of exporters are given in Figures 5.1-5.3. For larger, more productive and more profitable firm, it is easier to access external resource especially the bank loans.

Briefly, those findings, derived from simple descriptive statistics can be regarded as the source of evidence for the superiority of the exporters. Following the literature in order to provide more evidence on the performance differences between exporters and non exporters, means of the selected performance measures for exporting and non exporting firms are given in Table 5.1.

[18] Dated 01.02.2004 and 25334 (repeated) published in the Official Gazette with law number 5035, this new regulation provides tax payers that engage R&D activity significant tax advantages.

Table 5.1 Comparison Means of Performance Measures for Exporters and Non-Exporters

	Non Exporter	Exporter	t-stat	p-value	Mean Comparison Test Result*
Efficiency Measures					
Size	3.65	4.68	-120.1	0.00	Reject H_o
Productivity	4.71	5.13	-52.2	0.00	Reject H_o
Profitability	1.79	1.80	-14.6	0.00	Reject H_o
Quality Measures					
R&D Intensity	0.01	0.01	-13.1	0.00	Reject H_o
Capital Intensity	2.79	3.24	-47.0	0.00	Reject H_o
Marketing Expenses	0.17	0.29	-87.9	0.00	Reject H_o
Financial Measures					
Credit constraint	0.19	0.29	-72.7	0.00	Reject H_o
Liquidity	0.31	0.34	-30.6	0.00	Reject H_o

Source: Author's own calculations.
Ho: diff = mean(0) - mean(1)=0 and Ha: diff = mean(0) - mean(1)<0.
* t tests on the equality of means

According to mean comparison test results, for all measures the difference between exporters and non exporters are found to be statistically significant. The next step in our empirical investigation is the computation of exporter premia.

5.1.2 Export Premia

With the descriptive analysis given above, the exporters display better performance than non exporters according to the selected measures. In order to support this descriptive evidence, exporter premia will be calculated. Exporter premia is defined as the percentage difference of performance measure between exporters and non exporters. It is computed from the following regression:

$$\ln(y_{it}) = \alpha + \beta \text{Export}_{it} + \delta \text{Control}_{it} + \varepsilon_{it} \quad \textbf{(8)}$$

where y denotes selected performance measures (namely size, productivity, credit constraint, capital intensity, profitability, liquidity, technology usage and marketing expenses) and $Export_{it}$ is a dummy variable showing the export status of firm i at time t. $Export_{it}$ gets the value of 1 if the firm i's foreign sale is greater than zero at time t and zero

otherwise. The vector $Control$ contains a logarithm of the number of employees (except in the case of the size regression) and a macroeconomic variable, relative demand. For the regression that covers full sample crises dummies (for 1994, 2001 and 2008) are also included into $Control$ vector and ε is the error term.

Exporter premia is computed from the estimated β coefficient as $100 \times (\exp(\beta) - 1)$ and is interpreted as the percentage difference between exporters and non exporters. If for the given measure, exporters have better performance then positive and statistically significant estimate for the β coefficient is expected.

In order to utilize panel structure of the data and account for unobserved, time-invariant heterogeneity problem, the model is estimated with fixed effect[19]. Estimation results of the logarithm of the selected firm performances on the export status and other control variables together with the calculated exporter premia are given in Table 5.2.

[19] Fixed effects model is chosen against random effects model according to the Hausman test results.

Table 5.2 Fixed Effect Panel Data Regression of Firm Performance Measures on Export Status

	Coef.	Std. Err.	Premium	No of Obs.	No of Firms	Adjusted R^2
Dependent Variable: Size = log(Number of Employment)						
Full Sample (1990-2010)	0.32***	0.012	37.2%	84482	8738	0.82
1994 Crisis (1993-1995)	0.03***	0.020	2.9%	14237	5591	0.89
2001 Crisis (2000-2002)	0.09***	0.032	9.5%	12457	4970	0.92
2008 Crisis (2007-2010)	0.12***	0.026	12.6%	13760	4399	0.90
Dependent Variable: Productivity = log(Real Net Sales/Number of Employment)						
	Coef.	Std. Err.	Premium	No of Obs.	No of Firms	Adjusted R^2
Full Sample (1990-2010)	0.48***	0.014	61.8%	84474	8738	0.68
1994 Crisis (1993-1995)	0.17***	0.028	18.1%	14237	5591	0.80
2001 Crisis (2000-2002)	0.18***	0.037	19.2%	12455	4969	0.84
2008 Crisis (2007-2010)	0.32***	0.050	37.4%	13755	4399	0.84
Dependent Variable: Profitability = log(Operating Profits/Net Sales+1)						
	Coef.	Std. Err.	Premium	No of Obs.	No of Firms	Adjusted R^2
Full Sample (1990-2010)	0.00***	0.001	0.3%	84317	8737	0.16
1994 Crisis (1993-1995)	0.00	0.001	0.1%	14215	5585	0.48
2001 Crisis (2000-2002)	0.01	0.004	0.5%	12439	4969	0.29
2008 Crisis (2007-2010)	0.01	0.004	0.7%	13710	4391	0.29
Dependent Variable: Technology Usage = log(R&D Expenses/Operating Expenses)						
	Coef.	Std. Err.	Premium	No of Obs.	No of Firms	Adjusted R^2
Full Sample (1990-2010)	0.00***	0.001	0.3%	84482	8738	0.15
1994 Crisis (1993-1995)	0.00	0.002	0.1%	14237	5591	0.10
2001 Crisis (2000-2002)	0.00	0.003	0.1%	12457	4970	0.37
2008 Crisis (2007-2010)	0.00	0.002	0.0%	13755	4399	0.39
Dependent Variable: Marketing Expenses = log(Marketing Expenses/Operating Expenses)						
	Coef.	Std. Err.	Premium	No of Obs.	No of Firms	Adjusted R^2
Full Sample (1990-2010)	0.09***	0.003	9.3%	84482	8738	0.56
1994 Crisis (1993-1995)	0.06***	0.007	6.5%	14237	5591	0.50
2001 Crisis (2000-2002)	0.02***	0.007	2.0%	12457	4970	0.80
2008 Crisis (2007-2010)	0.03***	0.006	2.7%	13760	4399	0.81
Dependent Variable: Capital Intensity= log(Real Tangible Assets /Number of Employment)						
	Coef.	Std. Err.	Premium	No of Obs.	No of Firms	Adjusted R^2
Full Sample (1990-2010)	0.38***	0.015	46.9%	84482	8738	0.66
1994 Crisis (1993-1995)	0.07***	0.024	6.9%	14237	5591	0.86
2001 Crisis (2000-2002)	0.03	0.030	3.0%	12457	4940	0.90
2008 Crisis (2007-2010)	0.03	0.056	3.2%	13760	4399	0.74
Dependent Variable: Credit Constraints= log(Total Financial Liabilities/Total Liabilities)						
	Coef.	Std. Err.	Premium	No of Obs.	No of Firms	Adjusted R^2
Full Sample (1990-2010)	0.06***	0.002	5.7%	84463	8738	0.43
1994 Crisis (1993-1995)	0.01	0.006	0.6%	14228	5587	0.56
2001 Crisis (2000-2002)	0.01**	0.008	1.4%	12457	4970	0.67
2008 Crisis (2007-2010)	0.00	0.009	0.2%	13760	4399	0.68
Dependent Variable: Liquidity= log(Short-term Receivables/ Total Assets)						
	Coef.	Std. Err.	Premium	No of Obs.	No of Firms	Adjusted R^2
Full Sample (1990-2010)	0.00	0.002	0.3%	84481	8738	0.42
1994 Crisis (1993-1995)	0.01**	0.006	1.0%	14237	5591	0.52
2001 Crisis (2000-2002)	0.01	0.007	1.2%	12457	4970	0.64
2008 Crisis (2008-2010)	-0.01	0.007	-0.6%	13760	4399	0.65

Source: Author's own calculations.

Reported coefficient estimates are the coefficients on export status in a fixed effect panel data regression of logarithm of the firm specific performance measures for the full sample covering 1990-2010 and sub-samples covering 1993-1995, 2000-2002 and 2007-2010. All regressions include logarithm of the total employment (except regression for size) and macro economic variable relative demand. Models that are using full sample, crisis dummies for 1994, 2001 and 2008 are also included as explanatory variables. The model is estimated as fixed effects regression and cluster standard errors at firm level are used. *, **, *** indicates significance at 10 % level, 5 % level and 1% level respectively. Reported calculated premia are the percentage differences given by $(\exp(\hat{\beta})-1)*100$.

According to the calculated exporter premia, when full sample results are considered, except liquidity, for all of the selected performance measures the average percentage differences between exporters and non exporters are found to be statistically significant. The most distinct difference between exporters and non exporters arises in the productivity, size and capital intensity. Exporters are found to be on average 37.2 percent larger, 61.8 percent more productive and 46.9 percent more capital intensive than non exporters. Moreover they are 5.7 percent less credit constrained and 9.3 percent more spending for marketing. Even for profitability and technology usage the difference between exporters and non exporters is found to be statistically significant; the difference is not notable from economic point of view.

When the exporter premia are investigated for the periods in which crises deepened, it is observed that the differences between exporters and non-exporters shrink. This observation has several possible implications. The first possibility is that crisis may lead to the reduction in trade barriers. Lower trade barriers enable entry of the firms with worse performance into export markets and this leads to the shrinkage of the export premia. Another possibility is that crisis squeezes the domestic market profitability. For exporters, unless the crisis is global, there is an opportunity to compensate domestic market profit loses with exports. However, for some of the least productive non-exporters, crisis may lead to failure which in turn increases the average performance measures of the non-exporters and decreases the export premium. Another possibility is that if the crisis is global, then this time, some of the least productive exporters may force to cease the export activity. In this case, averages of the exporters and non-exporters converge to each other. As mentioned above, source of the shrinking export premia during crisis depends mainly on the type of crisis.

These simple but primary results about the superiority of the Turkish manufacturing exporters are all consistent with the previous findings that are reviewed in Chapter 2 which encourage us for further analysis.

5.2 SELF-SELECTION HYPOTHESIS

Previously conducted empirical studies revealed the fact that firms that export possess better performance than purely domestic firms. According to the heterogeneous trade theory, trade costs constitute a threshold that only can be surpassed by the most productive firms. In other words, a firm self-selects into export markets on the basis its relative performance in the domestic market and this implies that even before start to export positive performance premium exists. Therefore, self-selection hypothesis can be tested empirically by assessing the pre-export performance difference of export starters and non-exporters. Then, if firms do self-select into export markets then we should expect to find significant differences in performance measures between future export starters and future non exporters several years before some of them begin to export. Wagner (2007) recommends estimating the following equation with the sample of firms that did not export between year t-δ and t-1 for testing the validity of the self-selection hypothesis.

$$\ln(y_{it-\delta}) = \alpha + \beta\, \mathrm{Export}_{it} + \gamma Z_{it-\delta} + \varepsilon_{it} \qquad \textbf{(9)}$$

Here, the dependent variable y_{it} shows the selected performance measures namely number of employees (size), productivity, credit constraint, capital intensity, profitability, marketing expenses, liquidity and R&D expenses. Export_{it} is a dummy variable taking the value of 1 if the firm i starts to export at the current year t. $Z_{it-\delta}$ is the combination of variables that are specific to firms such as the logarithm of number of employee and macro economic variables such as real exchange rate, domestic and foreign demand and ε_{it} is the regression error.

The pre-entry premium, computed from the estimated coefficient β as $100 \times (\exp(\beta) - 1)$, shows the average percentage difference between today's exporters and non exporters δ years before starting to export. Estimated coefficients for specified dependent variables and calculated pre-entry premium of the future exporters are given in Table 5.3.

Table 5.3 Self Selection: Pre-entry Export Premium in Levels

		δ=3	δ=2	δ=1	Obs(1)	Firm(2)	LL(3)
	Coefficient	0.10***	0.10***	0.11***	19857	4970	-12860
Size	Std. Error	0.017	0.014	0.012			
	Premium (%)	**10.35**	**10.47**	**12.15**			
	Coefficient	0.18***	0.17***	0.18***	19855	4969	-16288
Productivity	Std. Error	0.02	0.016	0.014			
	Premium (%)	**19.82**	**18.73**	**19.79**			
	Coefficient	0.01*	0.02***	0.02***	19847	4962	12937
Credit Constraint	Std. Error	0.005	0.004	0.003			
	Premium (%)	**0.98**	**1.54**	**1.70**			
	Coefficient	0.07***	0.13***	0.12***	19857	4970	-17400
Capital Intensity	Std. Error	0.022	0.019	0.015			
	Premium (%)	**7.48**	**13.99**	**12.87**			
	Coefficient	0.00	0.00**	0.00*	19803	4955	37889
Profitability	Std. Error	0.001	0.001	0.001			
	Premium (%)	**0.07**	**0.28**	**0.20**			
	Coefficient	0.00	0.00	0.00	19857	4970	15422
Liquidity	Std. Error	0.004	0.003	0.003			
	Premium (%)	**0.14**	**-0.16**	**-0.49**			
	Coefficient	0.00	0.00	0.00	19857	4970	33978
R&D Expenses	Std. Error	0.001	0.001	0.001			
	Premium (%)	**-0.17**	**0.06**	**0.01**			
	Coefficient	0.00	0.00	0.01***	19857	4970	14831
Marketing Expenses	Std. Error	0.004	0.003	0.003			
	Premium (%)	**-0.35**	**0.26**	**1.32**			

Source: Author's own calculations.
The reported coefficients are obtained from fixed effects panel data regression of logarithm of performance measure on export status dummy. The reported estimated premium are the average percentage difference given by (exp(β)-1)*100 where β is the export dummy coefficient from regression 3. Given standard errors are robust and *, **, *** indicates significance at 10 % level, 5 % level and 1% level respectively. All regressions (except regression for size) include logarithm of number of employee and real exchange rate, domestic and foreign demand. Regression for size includes real exchange rate, domestic and foreign demand.
(1) is the number of observations available for the model with d=1. (2) represents the number of firms available for the model with d=1 and (3) shows the log likelihood of the model with d=1.

Estimation results indicate that the pre-entry export premiums in levels are positive and statistically different than zero which can be regarded as strong evidence for the validity of self-selection hypothesis. Export starters have already displayed better performance during the pre-entry period. Future exporters are found to be on average larger, more productive and more capital intensive in the pre-entry period. Although, profitability, credit constraints and quality indicator marketing expenses differences are found to be statistically significant their magnitudes are negligible from economic point of view. A performance improvement of the future exporters as the time of becoming exporter approaches is another important finding of this analysis.

Wagner (2005) using 45 microeconometric studies for 33 countries concluded in his survey study that exporters are more productive and their pre-entry performances are also better which is considered as an evidence for the self-selection of the good firms into export markets. Therefore, our findings are in line with the common findings emerged from previous studies. While self-selection hypothesis almost gains the status of stylized fact, evidence regarding the learning-by-exporting hypothesis is still confusing. In the next section, using dataset for Turkey, answer of this dubious question will be searched.

5.3 Testing Learning-by-Exporting

In the previous section, it is concluded that one source of observed superiority of the exporting firms comes from self-selection of good firms into export market. In this section, other direction of the causality will be investigated that is to say validity of learning-by-exporting will be tested. According to the learning-by-exporting hypothesis, engaging exporting activity improves the firm's performance and its validity is tested by investigation post-entry performance change of exporting firms.

In the literature, previous research results related with learning-by-exporting hypothesis have been contradictory. The pioneers of this literature, Bernard and Jensen (1999b) and Clerides et al. (1998) failed to find evidence of learning-by-exporting for US and Colombia and Morocco firms respectively. Likewise, Aw et al. (2000) for Korean and Arnold and Hussinger (2004) for German manufacturing firms find no statistically significant evidence for this effect. Contrary to non-supportive evidences for learning effect derived from previous empirical studies, with more elaborate investigation of the recent studies reveal the importance of learning effect especially for the developing countries. Kraay (1999) for China, Isgut and Fernandes (2007) for Colombia, Bigsten et al. (2004) for sub-African countries, Blalock and Gertler (2004) for Indonesia, DeLoecker (2007) for Slovenia, and Albornoz and Ercolani (2007) for Argentina concluded on the

behalf of significant positive effect of export experience on the productivity of the firms.

Learning-by-exporting has also been studied using different data and techniques for Turkish manufacturing firms. Yasar and Rejesus (2005), Yasar et al. (2007) and Maggioni (2012) using TURKSTAT Annual Manufacturing Survey studied learning effect of exporting and found supportive evidence for it. Aldan and Günay (2008)[20] used CBRT Company Accounts data set and also concluded that learning-by-exporting holds for Turkish manufacturing firms. On the other hand, Kılıçaslan and Erdoğan (2012) using Turkey's top 1000 industrial enterprises for 1997-2007 periods found no statistically significant evidence for the learning effect. However, this conflicting conclusion can be the result of bias sample that the authors used. Already, in several studies such as Bin et al. (2012) for China and Albornoz and Ercolani (2007) for Argentina concluded that learning-by-exporting effects vary considerably with the size of the firms and smaller firms learn more from exporting. Therefore, Kılıçaslan and Erdoğan (2012) conclusion about no statistically significant learning-effect can be due to the considering only large firms.

Here, using relatively more representative sample the learning effect will be re-examined for 1990-2010 period with CBRT data set. In the following subsection data and the econometric strategy for investigating the impact of starting to export on various performance measures will be discussed.

5.3.1 Using PSM and DID in Learning-by-Exporting Assessment

There are two commonly used methods in testing empirically validity of the learning-by-exporting. The one is to add export status as an independent variable into the firm's performance equation and the other is to use treatment evaluation techniques by considering starting to export as a treatment for the firms. Self-selection of the exporting firms is well-documented characteristics of the manufacturing firms in the literature and

[20] They used same dataset, from CBRT but their analyses were based on different variables for a restricted period 1989-2003.

this selection bias leads to the failure of standard estimation techniques. Hence, treatment evaluation techniques, more precisely, Propensity Score Matching (PSM) and difference-in-difference (DID) approaches gains increasingly popularity in the recent empirical literature since it offers to mitigate, observable and non observable, selection bias.

As it was mentioned before, according to learning-by-exporting hypothesis, exporting fosters firm performance and its validity can be tested ideally by comparing the firm post-entry performance with the performance that if it were not begin to export. However, in reality, observing these two outcomes together is not possible. Rosenbaum and Rubin (1983) proposed Propensity Score Matching (PSM) approach to handle this impossibility. The idea of PSM is to match export starters (treatment group) with non-exporters (control group) that have similar pre-entry observable characteristics and then evaluate the average treatment effect on the treated. More formally, by letting, Y_{1i} and Y_{0i} denotes the outcome of unit i if i were exposed to treatment and if i were not exposed to treatment respectively and $D_i \in \{0,1\}$ is a dummy variable that takes the value of 1 if unit i received treatment. Then, the observed outcome can be expressed as follows:

$$Y_i = Y_{0i} + D_i(Y_{1i} - Y_{0i}) \quad \textbf{(10)}$$

The effect of treatment for an individual i is:

$$\tau_i = Y_{1i} - Y_{0i} \quad \textbf{(11)}$$

The basic problem is that actually only one outcome is observed for unit i (either it exposed to treatment or not). Hence, estimating individual treatment effect is impossible; instead, under some assumptions different average treatment effects can be estimated. The mean impact of the treatment is named as Average Treatment Effect (ATE) and it corresponds to the average impact of all units in the population,

$$ATE = E(\tau) = E(Y_1 - Y_0) \quad \textbf{(12)}$$

where E(.) represents the expected value.

The (conjectural) effect of treatment on those units that are not exposed to treatment is named as Average Treatment Effect on the Untreated (ATU):

$$ATU = E(\tau|D = 0) = E(Y_1 - Y_0|D = 0) = E(Y_1|D = 0) - E(Y_0|D = 0) \quad \textbf{(13)}$$

The last but the most attention received parameter is the Average Treatment Effect on the Treated (ATT) which captures the effect of treatment on those units that exposed to treatment:

$$ATT = E(\tau|D = 1) = E(Y_1 - Y_0|D = 1) = E(Y_1|D = 1) - E(Y_0|D = 1) \quad \textbf{(14)}$$

However, as noted before, each unit either exposed to treatment or not, hence $E(Y_0|D = 1)$ and $E(Y_1|D = 0)$ counterfactual means are not observable. According to Rosenbaum and Rubin (1983) under several assumptions consistent estimation of these counterfactual means can be obtained. The first assumption is related with the independence and it is assumed that with observed characteristics the selection can be identified completely. Another assumption is related with the common support which implies unit with the same covariates has a positive probability of receiving and not receiving the treatment.

The matching process starts with the calculation of the propensity scores. The likelihood of being treated is modeled by means of a binary choice model (either logit or probit):

$$\Pr(D_i = 1|x) = F(x\beta) \quad \textbf{(15)}$$

where x stands for observable covariates and F(.) denotes cumulative distribution function, for probit standard normal and for logit it takes logistic distribution function.

Then, using the estimated parameters, for each unit in the sample, the probability of being treated (known as propensity scores in treatment literature) is calculated. The next step in PSM is to match units that

exposed to treatment with non treated units that have similar observable characteristics by means of calculated propensity scores so that the treated and untreated units become comparable. There are different alternative approaches for the matching algorithm. Nearest neighbor (NN), NN with caliper, radius, stratification and Kernel matching are among the most commonly used alternative approaches. The nearest neighbor matching is the simplest and the most straightforward algorithm. A treated unit is matched with an untreated unit that has the closest propensity score according to the NN matching algorithm. NN with caliper is the modified version of NN matching algorithm in which a tolerance level (caliper) is pre-specified in order to avoid the risk of bad match. The radius matching algorithm is an extended version of NN with caliper and it uses caliper for all untreated units. In stratification matching, the common support of the propensity score is divided into several strata and matching is carried out within each strata. Kernel matching algorithm does not deal with choosing the best match instead it uses weighted average of all untreated units outcomes. However, weights play key role in Kernel algorithm, the weights are constructed by taking into account the distance between the treated and untreated propensity scores and the closest untreated unit takes the greatest weight. It has to be noted that there is no exact guidance for the selection of the optimal matching algorithm for different circumstances. Selection of the matching algorithm is related with the tradeoff between bias and efficiency. In Table 4.4 which is taken from Caliendo and Kopeinig (2005) shows the tradeoff between bias and variance according to the selection of the matching algorithm.

Table 5.4 Trade-Offs in Terms of Bias and Efficiency

Decision	Bias	Variance
Nearest neighbor matching:		
multiple neighbors / single neighbor	(+) / (-)	(-) / (+)
with caliper	(-) / (+)	(+) / (-)
Use of control individuals:		
with replacement / without replacement	(-) / (+)	(+) / (-)
Choosing method:		
NN-matching / Radius matching	(-) / (+)	(+) / (-)
KM or LLM / NN-methods	(+) / (-)	(-) / (+)
Bandwith choice with KM:		
small/ large	(-) / (+)	(+) / (-)

KM: Kernel Matching, LLM: Local Linear Matching NN: Nearest Neighbour
Increase: (+), Decrease (-)
Source: Caliendo, M and Kopeinig (2005), "Some Practical Guidance for the Implementation of Propensity Score Matching". IZA Discussion Paper Series, DP No. 1588.

PSM was designed for cross sectional data in order to cope with selection bias that arises from observable characteristics of the units. However, in heterogeneous trade literature, now it is well-known that unobserved firm specific characteristics also create selection bias. Heckman, Ichimura and Todd (1997) combined PSM which was designed for cross sectional data with DID method and extended this method for panel data.

5.3.2 Propensity Score Matching Estimates

In order to investigate the impact of starting export activity on firm performance, a firm is called export starter if it does not export at time t-2 and t-1, starts to export at time t and continue to export at time t+1 and t+2. The control group contains non-exporters which are identified as not export for all of the years from t-2 to t+2. Therefore, recursive time spans with five years are considered. Starting with 1989-1993 period, firms are classified as export starters and non-exporters, and then move to 1990-1994 period and so on. Hence, with this classification, firms with irregular export strategy are omitted. The pre-entry and post-entry firm characteristics are determined by the averages of the covariates. Pre-entry characteristic for a firm that starts to export at time t is defined as the average of firm characteristic at time t-1 and t-2. Post-entry characteristic is

defined as the average of firm characteristic at time t+1 and t+2. Therefore, it is end up with 10073 observations for 1991-2008 period and 8609 of the observations belong to non-exporters and 1458 observations to export starters.

As a first step, the propensity scores are estimated for each firm in the sample. To do so, the following discrete choice model is estimated with logit and the corresponding estimation results are presented in Table 5.5.

$$Estart_i = \Theta(\alpha + \beta_1 Size_0 + \beta_2 Productivity_0 + \beta_3 Credit_0 + \beta_4 Capital_0 + \varphi S_i + \gamma T + \varepsilon_i) \quad \textbf{(16)}$$

where $Estart$ is the dummy variable that takes the value of 1 if the firm is export starter and zero if the firm is non-exporter as explained above. The subscript 0 implies the pre-entry performance measures. Therefore, the propensity of starting to export is assumed to depend on the pre-entry size, productivity, credit constraint, capital intensity and profitability. S and T stands for the sector and time dummies. In Table 5.5, estimation result for the propensity score model is presented.

Table 5.5 Propensity Score Model Coefficient Estimates

	Coefficient	Standard Error
Size	0.31**	0.02
Productivity	0.08***	0.02
Credit Constraint	0.43***	0.10
Capital Intensity	0.16***	0.02
Profitability	0.92***	0.55
Number of observations		10036
Number of export starters		1450
Number of non-exporters		8586
Log likelihood		-3487
Pseudo R2		0.16

Source: Author's own calculations.

Pre-entry firm size, productivity, credit constraints, capital intensity and profitability are found to be statistically significant determinant for starting export. Using estimation results, propensity score for 10073 firms for 1991-2008 periods are calculated and the matching of the export

starters and non-exporters are carried out using the user-written STATA program psmatch2 (Leuven and Sianesi, 2003). Nearest neighbor with caliper 0.01 matching algorithm is preferred[21].

The matching quality of the algorithm is examined by means of investigation balancing property of pre-entry covariates. Table 5.6 gives the tests for the success of the matching of covariates.

Table 5.6 Assessing the Matching Quality: Balancing Property of the Pre-Entry Covariates

		Pre-entry					
		Mean			% Red.	t-test	
		Export Starter	Non-exporter	%Bias	|Bias|	t	p>|t|
Size	Unmatched	4.21	3.57	56.80		20.44	0.00
	Matched	4.17	4.17	0.00	99.9	0.01	0.99
Productivity	Unmatched	4.83	4.80	2.60		0.92	0.36
	Matched	4.83	4.84	-0.50	79.8	-0.15	0.88
Credit Constraint	Unmatched	0.19	0.17	14.50		5.15	0.00
	Matched	0.19	0.19	-1.80	87.4	-0.48	0.63
Capital Intensity	Unmatched	2.94	2.72	18.80		6.78	0.00
	Matched	2.94	2.99	-3.10	83.7	-0.82	0.41
Profitability	Unmatched	1.80	1.79	10.50		3.77	0.00
	Matched	1.80	1.80	0.10	99.9	0.03	0.97
Liquidity	Unmatched	0.33	0.30	17.60		5.95	0.00
	Matched	0.33	0.33	-1.90	88.9	-0.54	0.59
R&D Expenses	Unmatched	0.01	0.01	3.20		1.17	0.24
	Matched	0.01	0.01	1.90	33.7	0.54	0.59
Marketing Expenses	Unmatched	0.15	0.17	-12.90		-4.39	0.00
	Matched	0.15	0.16	-7.60	41.0	-2.11	0.04

	Pseudo R2	LR chi2	p>chi2
Unmatched	0.060	500.10	0.00
Matched	0.002	6.08	0.64

Source: Author's own calculations.

The first sign for the success of the matching algorithm is the obtained insignificant t-statistics after matching. The t-tests given in the

[21] Alternative algorithms estimation results are given in the Appendix.

following table show that matching quality is satisfactory since after matching, differences between the mean values of the treated (export starters) and control (non-exporters) groups disappear for each variables. Another sign for the success of the matching is the pseudo R^2 before and after matching that is given at the bottom panel of the table. After matching, fairly low pseudo R^2 is expected if the matching is satisfactory. In our case, pseudo R^2 declines even approaches to zero after matching. Lastly, the joint F test statistics for testing whether variables are jointly balanced imply that matching algorithm did good job. Hence, matching quality assessment shows that the chosen algorithm yields a satisfactory result and we obtain a control group which has similar pre-entry firm-specific factors that enables us to evaluate the impact of starting export on firm's performance.

Table 5.7 Estimated Average Treatment Effect of Export Starters

	Entry Period				Post-Entry Period			
	ATT	Bootstrap Std. Err.	Z	P>|z|	ATT	Bootstrap Std. Err.	Z	P>|z|
Size	0.09**	0.05	1.94	0.05	0.16***	0.04	3.89	0.00
Productivity	0.12***	0.04	2.69	0.01	0.19***	0.04	4.84	0.00
Credit constraint	0.05***	0.01	7.27	0.00	0.07***	0.01	8.31	0.00
Capital Intensity	0.07	0.07	1.00	0.32	0.12*	0.07	1.72	0.09
Profitability	0.00	0.00	1.51	0.13	0.01***	0.00	4.00	0.00
Liquidity	0.01	0.01	1.38	0.17	0.02***	0.01	3.17	0.00
R&D Expenses	0.00	0.00	0.44	0.66	0.00	0.00	0.93	0.35
Marketing Expenses	0.02**	0.01	2.12	0.03	0.05***	0.01	6.38	0.00

Source: Author's own calculations.
ATT stands for the average treatment effect on treated.
*, ** and *** denotes significance at 0.10, 0.05 and 0.01 level respectively.

First and foremost, positive and highly significant coefficient estimates for size, productivity, credit constraints and marketing expenses provide strong evidence for the existence of the learning-effect. Our results support both immediate positive entry and positive post-entry effects of export activity on size, productivity, financial health, quality competition and capital intensity. Efficiency gains (size and productivity), improvement

in financial health (credit constraints) and increase in quality competition (marketing expenses) for export starters observed immediately after entering the export market. Moreover, as time passes the efficiency gains, liquidity constraints relaxation and quality competition improves further in the post-entry period. In the post-entry period, positive effect of export activity is observed not only in productivity, size, and credit constraint and quality competition but also observed in capital intensity, profitability and liquidity. The results show that as export starters learn more by exporting they start to be larger, more productive, less credit constraint, more capital intensive, more profitable, more liquid and more quality competitive.

Findings supporting evidence for the existence of learning-effect for Turkish manufacturing firms are consistent with the recent empirical literature which asserts that learning-by-exporting is more plausible for developing countries. Moreover, the validity of the learning effect for Turkish manufacturing firms has been shown by various previously conducted studies that used different dataset and/or methods. As mentioned before, Yaşar and Rejesus (2005), Yaşar et al. (2007), Aldan and Günay (2008) and Moggioni (2012) used propensity score matching approach with difference-in-difference method for testing the hypothesis. These studies found evidence supporting the importance of learning-effect. Our findings in this section confirm previous findings and extend the analysis of Aldan and Günay by considering wider range of firm specific characteristics for wider time horizon.

Empirical literature proceeded by testing existence of sunk cost after observing self-selection of better firms into export markets. The idea of testing the existence of fixed exogenous trade costs came from theoretical models that reveal existence of sunk-costs act as barrier and only the most productive firms can cross this barrier and become exporter. Hence, following the existing literature existence of sunk-cost is investigated in order to gain better understanding of export behavior of Turkish manufacturing firms. In addition to testing the existence of sunk-costs, this section will enable us to investigate the impact of crises on the exporting behavior of firms.

5.4 Testing Existence of Sunk-Costs

Firms that are planning to enter into export markets may need to pay additional costs, referred to as sunk export costs. According to general belief only "good" firms can afford those sunk-costs and this is the leading reason for observing strong evidence for the self-selection of the exporters.

Roberts and Tybout (1997) proposed an empirical model for testing the validity of this belief. Their empirical model is based on the theoretical model given by Dixit (1989a, 1989b), Baldwin (1989), Baldwin and Krugman (1989) and Krugman (1988) in which they show that existence of sunk entry costs produces hysteresis in trade flows. Proceeding from this finding, Roberts and Tybout (1997) proposed dynamic discrete choice model for testing the existence of sunk cost.

In Roberts and Tybout (1997), it is assumed that for each period t, firm's expected gross profits differ by the amount $\pi_i(p_t, s_{it})$ if exports. Here, p_t denotes exogenous market-level variables and s_{it} denotes state variables specific to firms. Assume that firm faces an export market entry cost of F_i^0if it never exported previously and face a re-entry cost of F_i^j if it last exported in year $t-j$ ($j \geq 2$). Hence, their earnings become $\pi_i(p_t, s_{it}) - F_i^0$ if they enter export market for the first time and $\pi_i(p_t, s_{it}) - F_i^j$ if they exit and re-enter the export market at period t. Finally, a firm that exported in the previous period earns $\pi_i(p_t, s_{it})$ during period t by continuing exporting and $-X_i$ if exists. This information was collapsed together in a single expression and the following discrete choice is derived:

$$Y_{it} = \begin{cases} 1 \text{ if } \pi_i(p_t, s_{it}) + \delta\{E_t(V_{it+1}(\Omega_{it+1})|Y_{it}=0\} \geq F_i^0 - (F_i^0 + X_i)Y_{it-1} + \sum_{j=2}^{J_i}(F_i^0 - F_i^j)\widetilde{Y}_{it-j} \\ 0 \text{ otherwise} \end{cases} \quad \textbf{(17)}$$

Due to its difficulty, Roberts and Tybout pursued reduced form approach and assume that $\pi_i(p_t, s_{it}) - F_i^0$depends on three factors: time-specific effects that reflect sector specific or macro-level changes in export conditions (μ_t) such as exchange rates, credit market and policy conditions,

firm specific factors (Z_{it}) such as set of sector dummies, size, productivity, capital stock, age and standard error terms, ε_{it}.

$$\pi_i(p_t, s_{it}) - F_i^0 = \mu_t + \beta Z_{it} + \varepsilon_{it} \quad \textbf{(18)}$$

Additional restriction on sunk entry and exit costs are needed in order to identify the model. It is assumed that $\gamma_i^j = \gamma_i^0 = F_i^0 + X_i (j \geq t+1)$ implying that experience is completely depreciated if it was acquired more than J years ago. With this simplifying assumption the following dynamic discrete choice equation for the export market participation is obtained:

$$Y_{it} = \begin{cases} 1 \; if \; \mu_t + \beta Z_{it} + \gamma^0 Y_{it-1} + \sum_{j=2}^{J} \gamma^j \tilde{Y}_{it-j} + \varepsilon_{it} \geq 0 \\ 0 \; otherwise \end{cases} \quad \textbf{(19)}$$

In case in which all γ^J's are zero in equation (20), the export decision at time t does not depend on the exporting history which implies no persistence pattern in export behavior that is to say no sunk-costs exist. Therefore, with this setting, testing joint significance of $\gamma^0$and γ^1 is equivalent to test the existence of sunk-cost. It is also possible to analyze the rate of depreciation of experience and accumulated knowledge in export activities by looking at these coefficients individually.

The estimation of this dynamic binary choice model faces two main problems. One is the serially correlated error terms due to the presence of unobserved heterogeneity. To account for this, in general, random effects probit model is used. The other serious problem is known as the "initial conditions problem". There are several approaches for dealing the initial condition problem that is encountered in the dynamic discrete choice models. Heckman (1981) suggests specifying a conditional distribution for the initial condition, while Wooldridge (2005) suggests much simpler solution for this problem. Wooldridge (2005) proposes to include the initial value of the dependent variable and the mean values of the time variant explanatory variables for each firm as additional explanatory variables for

the solution of initial condition problem. Due to its practical ease Wooldridge approach is preferable.

Following Roberts and Tybout (1997), the existence of sunk-cost is tested by setting discrete choice model for the current export status of the firm (Y_{it}) as a function of export history($\sum_{j\geq 1}\gamma^j \tilde{Y}_{t-j}$), economy wide variables (X_t) and firm specific factors (Z_{it}).

$$\mathrm{Y_{it}} = \alpha + \sum_{\mathrm{j}\geq 1} \gamma^{\mathrm{j}} \tilde{\mathrm{Y}}_{\mathrm{t-j}} + \beta \mathrm{X_t} + \theta \mathrm{Z_{it}} + \varepsilon_{\mathrm{it}} \qquad \textbf{(20)}$$

Here we choose j to be three so that the export history of the firms characterized by $(\tilde{\mathrm{Y}}_{\mathrm{it-1}}, \tilde{\mathrm{Y}}_{\mathrm{it-2}}, \tilde{\mathrm{Y}}_{\mathrm{it-3}})$ where $\tilde{\mathrm{Y}}_{\mathrm{it-k}}$ is a dummy variable that indicates the firm i exports last in k years ago. More precisely,

$$\tilde{\mathrm{Y}}_{\mathrm{it-1}} = \begin{cases} 1, \text{if } \mathrm{Export_{it-1}} > 0 \\ 0, \text{otherwise} \end{cases}, \quad \tilde{\mathrm{Y}}_{\mathrm{it-2}} = \begin{cases} 1, \text{if } \mathrm{Export_{it-1}} = 0 \text{ and } \mathrm{Export_{it-2}} > 0 \\ 0, \text{otherwise} \end{cases} \text{ and}$$

$$\tilde{\mathrm{Y}}_{\mathrm{it-3}} = \begin{cases} 1, \text{if } \mathrm{Export_{it-1}} = 0 \text{ and } \mathrm{Export_{it-2}} = 0 \text{ and } \mathrm{Export_{it-3}} > 0 \\ 0, \text{otherwise} \end{cases} \qquad \textbf{(21)}$$

Then current export status of the firms is modeled as a function of the previous export history($\tilde{Y}_{t-1}, \tilde{Y}_{t-2}, \tilde{Y}_{t-3}$), firm-specific factors ($\mathrm{Z_{it}}$) such as efficiency measures (productivity, profitability and competitiveness), quality measures (endogenous sunk costs, R&D and capital intensity) and financial measures (credit constraints and liquidity). In order to account for the size and sectoral differences of the firms size dummies and technological intensity dummies are included. In order to investigate possible impact of the macro-level changes ($\mathrm{X_t}$), real exchange rate, foreign demand variables and crisis dummies for 1994, 2001 and 2008 are included. In addition to these standard independent variables, in order to investigate the variation of sunk-cost during the crisis interaction terms of the crisis dummies with lagged export status $\tilde{Y}_{it-1}$are also considered.

Unobserved time invariant heterogeneity problem is accounted by estimation the model with random effects[22]. Moreover, initial export status ($Y_{i,0}$) and the averages of time varying firm-specific regressors ($\bar{Z}_i$) are included in order to account for the initial condition problem as suggested in Wooldridge. Estimation results of the dynamic Logit model are given in Table 5.8.

Table 5.8 Testing Existence of Sunk-cost: Dynamic Logit Estimation Results

Dependent Variable, Y_{it} : Export Status of the Firm i at time t (Dummy variable that takes value of one if the firm foreign sales is positive at time t and zero otherwise)			
Independent Variables	**Coefficient**	**Std. Error**	**Marginal Effect**
Previous Export Status			
$\tilde{Y}_{t-1}$	2.45***	0.04	0.453
$\tilde{Y}_{t-2}$	0.44***	0.05	0.064
$\tilde{Y}_{t-3}$	0.02	0.07	0.004
Interaction of Previous Export Status and Crisis Dummy			
$\tilde{Y}_{t-1} \times D1994$	-0.70***	0.12	-0.135
$\tilde{Y}_{t-1} \times D2001$	0.03	0.13	0.004
$\tilde{Y}_{t-1} \times D2008$	0.51***	0.14	0.072
Size Dummies[(5)]			
Micro	-1.19***	0.07	-0.250
Small	-0.46***	0.03	-0.078
Large	0.39***	0.05	0.059
Technology Intensity Dummies[(6)]			
Medium-low	0.05	0.04	0.009
Medium-High	0.14**	0.04	0.020
High	0.35**	0.13	0.051

[22] Technical explaination for chosing random effects model is given in Roberts and Tybout (1997). Briefly, referring to Heckman (1981), for the models in which the time dimension is large, standard logit/probit estimator using firm-specific dummy variables will not yield consistent slope coefficient. Here, in our case T= 18 which is comparatively higher than T=8 that was noted as "...the bias in slope coefficients from a dynamic probit with unobservable effects is "distrubingly large" (p.180) when T=8" (p.16).

Table 5.8 (continued)

Dependent Variable, Y_{it} : Export Status of the Firm i at time t (Dummy variable that takes value of one if the firm foreign sales is positive at time t and zero otherwise)			
Independent Variables	**Coefficient**	**Std. Error**	**Marginal Effect**
Other Firm Specific Variables			
Productivity	0.06***	0.02	0.010
Credit constraint	0.58***	0.09	0.094
Capital Intensity	0.11***	0.02	0.018
Profitability	0.91**	0.40	0.149
Liquidity	-0.50***	0.11	-0.082
R&D Expenses	0.61**	0.25	0.100
Marketing Expenses	1.10***	0.10	0.180
Macro Economic Variables			
Real Exchange Rate	-0.01***	0.00	-0.001
World Demand	0.02***	0.00	0.003
Dummy for 1994 Crisis	1.07***	0.06	0.130
Dummy for 2001 Crisis	0.07	0.09	0.011
Dummy for 2008 Crisis	-0.40***	0.11	-0.072
σ_v (2)	0.71	0.02	
Rho(2)	0.13	0.008	
Number of Observations	76250	$\chi^2_{(42)} = 18652^{***}$ (3)	
Number of Firms	8737	$\chi^2_{(1)} = 435.0^{***}$ (2)	
Log Likelihood	-21676	$\chi^2_{(3)} = 31.1^{***}$ (4)	

Source: Author's own calculations.
(1) *, **, *** indicates significance at 10 % level, 5 % level and 1% level respectively.
(2) σ_v stands for the panel-level variance component and rho=$\sigma_v^2/(1+\sigma_v^2)$ shows the share of panel-level variance in total variance. $\chi^2_{(1)}$ is the LR-test statistics for testing the significance of rho; Ho: rho=0.
(3) $\chi^2_{(42)}$ is the Wald chi-square test statistics for joint significance of the estimated parameters that show the performance of the given specification.
(4) $\chi^2_{(3)}$is the test statistics for testing H_o: $Coefficients\ for\ \tilde{Y}_{t-1} \times D1994,\ \tilde{Y}_{t-1} \times D2001, \tilde{Y}_{t-1} \times D2008$ are all jointly equal to zero.
(5) Medium sized firms are the control group
(6) Low technological intensity sector is the control group.

In the second and the third columns of the table, coefficients and their corresponding robust standard errors for the parameters from dynamic logit model are given. In the last column, the marginal effects at the means for each continuous covariate and discrete changes for the dummy variables are presented. Specification tests and the general model information are given at the bottom part of table. Significance of the parameter estimates is denoted by *, **, *** according to different significance levels. At the first sight, estimated model seems to perform well. Model

specification test statistics, $\chi^2_{(42)}$, implies that jointly insignificance of the parameters can not be accepted. Moreover, the rejection of the null hypothesis for rho equals to zero, shows that panel estimation is appropriate for this model.

The lagged export status, $\tilde{Y}_{t-1}$, is highly significant and positively large, implying highly persistence pattern in export status. Significance of the previous export status reveals the importance of sunk-cost on the export propensity of the Turkish manufacturing firms. When marginal effect of the previous year's export status is taken into account, the persistence becomes more obvious. The firm's export probability increases by 0.451 when it exported last year. Referring to the theoretical hysteresis literature, this persistence (or hysteresis in other words) is the result of existing sunk-cost. Therefore, estimation result provides strong evidence for the existence of the sunk-cost on the export decision. Besides significance of lagged export status, the coefficient on last exported two years ago is diminishing but still positively significant which implies that the benefits of past export market participation do not depreciate fully immediately after the exit. However, statistically insignificant coefficient on, $\tilde{Y}_{t-3}$, points out that previous export market experience perishes after three years and firms that last exported three years earlier face re-entry costs. The existence of sunk-costs for the case of Turkey was first studied by Özler et al. (2010) using different dataset coming from TURKSTAT for the period 1990-2001. They found high sunk-costs of entry into export markets and moreover full history of the exporting matters for the current export decision. Consistent with our findings they concluded that past export market experience depreciates rapidly.

When firm specific factors are considered, all variables are found to be statistically significant determinants of the likelihood of becoming exporter. Increases in efficiency (size, productivity and profitability) and quality (capital intensity, R&D and marketing expenses) increase the probability of exporting. Moreover, as capacity to borrow increases the probability of exporting increases. This can also be considered as an evidence for the existence of sunk-cost. If the firm finances the sunk-cost

through credit then borrowing power is more likely to be an important determinant for the exporting probability. Negatively significant estimate for the liquidity implies deliberate approach of the firms. As mentioned in the chapter related with the variables, liquidity variable is constructed as the ratio of trade receivables to total assets. Trade receivables contain credit sales which entertain a risk of bad debt. Hence, in case of which liquidity level increases as a result of credit sales then firms may prefer to wait and see if they can get the payments. This wait and strategy of the firms is thought to be the initiative for the negative sign for the liquidity variable.

Among the firm specific factors, R&D and marketing expenses variable requires special attention since their implications are important to discuss. The variable that is named as marketing expenses includes expenditures for marketing, advertisement and distribution together with the R&D expenditures are considered as firm's investment for non-price competition. Sutton (1991) argued that marketing, advertising and all other costs for enhancing consumer's willingness to pay for the firm's products are sunk-costs but they are endogenous since firm can choose to invest in. Unlike the exogenous sunk-costs, increase in endogenous sunk-costs has positive impact on exporting propensity since increase in endogenous sunk-costs implies increasing quality competition. The estimated coefficients for R&D and marketing expenditures (endogenous sunk-costs) are statistically significant and positive. Another important point is that marginal effects on the probability of becoming exporter are pretty high. Therefore, in addition to importance of exogenous sunk-costs, endogenous sunk-costs are also important factors in the exporting behavior of the firms.

In addition to firm-specific factors, according to the estimation results, macro economic developments also play significant role in the propensity of exporting. The real exchange rate has negative and significant impact as expected. A decrease in the real exchange rate implies depreciation of the Turkish Lira which increases the expected revenues from exporting by increasing competitiveness power of the Turkish firms against their foreign counterparts and consequently increases the propensity to become exporter. When foreign demand is considered it is

found that the impact of foreign demand is significantly positive implying expanding foreign markets encourages firms to become exporter. This implies that Turkish manufacturing firms do not hesitate to enter into expanding and more competitive markets.

Turning to the sunk-costs variables, the interaction terms between the crisis dummies and the previous export status show the sunk-cost variation during the crisis years. First of all, joint significance of these terms is checked and it is concluded that at least one of the interaction terms is different than zero. This finding implies that sunk costs vary during the crisis. Negatively significant interaction coefficient estimate for 1994, $\tilde{Y}_{t-1} \times D1994$, implies that for 1994 crisis, the importance of the sunk-cost is found to be weakened which facilitates entrance into export markets. On the contrary, the estimated interaction coefficient for 2008, $\tilde{Y}_{t-1} \times D2008$ is found to be statistically significant and positive which implies with the occurrence of 2008 crisis the importance of sunk-cost magnifies. As mentioned in Roberts and Tybout (1997), it is easier to enter into an expanding world market than shrinking one. Hence, during 2008 global crisis, the world demand shrunk considerably which makes engaging export activity difficult and positively significant coefficient for the interaction term reflects this challenge. For 2001 crisis, no statistically significant sunk-cost difference is observed.

Interpreting the coefficients of the crisis dummies with the varying sunk-costs during the crisis clarifies the picture. According to the estimation results, occurrence of 1994 crisis increases the propensity to become exporter. This is inherently expected since it is concluded that in 1994 the sunk-cost declined which increased expected profits from exporting and stimulated export market entry. In the case of 2001, neither statistically significant difference in the sunk-cost nor statistically significant impact of the crisis is observed. This can be due to the characteristics of the crisis. Stagnated domestic demand, depreciated Turkish lira and banking sector failures characterized 2001 crisis. Therefore, although currency devaluation increased competition in the export markets and shrinking domestic demand encourages firms to

become exporter, failing banking system may limit finance to these potential exporters. Hence it seems as if these two opposing factors absorb each other and the net effect is found to be statistically insignificant. Consequently, insignificant impact of 2001 crisis on the export propensity may be the reflection of credit rationing of banking sector that was exposed to smaller and less productive firms. On the other hand, recent crisis that occurred in 2008 found to have negative impact on the export propensity of the firms. Unlike, previously experienced crisis, in 2008 crisis, relatively mild currency devaluation and sharp contraction in foreign demand was experienced. Estimation results related with the sunk-cost variation during the crisis suggested that sunk-cost increased during 2008 crisis which made export entrance more difficult for the Turkish manufacturing firms.

Analysis from this section reveals the importance of sunk-costs on the export decision of the firms. Within hysteresis literature framework, existence of sunk-costs implies that some firms choose to absorb adverse effects of though periods and remains in the export markets in order to avoid paying re-entry costs. On the other hand, non-exporters have opportunity to wait until better or improved conditions attained for considering becoming exporters. Therefore, while presence of sunk-costs affects the export propensity of the firms, varying sunk-costs affects the timing decision of the firms. More precisely, for both exporters and non-exporters, another important decision is related with the selection of the appropriate timing to change export status (either to become exporter for non-exporters or to cease export activity for exporters). In the next section export market entry and exit dynamics of the Turkish manufacturing firms will be analyzed within the duration modelling framework.

5.5 Export Market Entry and Exit Dynamics

In the previous section, strong evidences about the presence of sunk-costs obtained. Moreover, estimation results showed that sunk-costs may vary with shocks. Those findings trigger the importance of analysing entry-exit dynamics of the firms. According to the sunk-costs literature, existence

of sunk-costs generates persistency in the export status. In order to avoid paying re-entry costs, exporters prefer to survive in export markets even in the though periods. On the other hand, sunk-costs not only influence the timing-decision of the exporters but also may affect decision of non-exporters. Since non-exporters have waiting opportunity, they can postpone entry into export markets in response to unfavourable shocks in the existence of sunk-costs.

Importance of entry-exit dynamics of the firms has been emphasized by Besedes and Prusa (2007). They characterized duration and export growth relation by linking exit and entry dynamics with the extensive and intensive margins of the trade. They proposed to decompose the sources of export growth into three as: (i) establishing new partners and new markets, (ii) having relations survive and (iii) having relationships deepen. The first source is related with the entry dynamics which in turn affect the extensive margins of trade and the other two sources are considered to be related with exit dynamics (survival in export markets) so linked with the intensive margins of trade. They showed that survival is a significant factor in explaining difference in long run export performance. Moreover, they claimed that higher export growth for developing countries can be achieved if they can improve survival in the export markets.

Contrary to theoretical model predictions, empirical findings show that survival of firms is short-lived despite the sunk-costs. Sabuhoro and Gervais (2004) found that one third of the Canadian establishments export for one month only and the median survival time is 20 months. Görg et al. (2008) using Hungarian firm-level data showed that the hazard rate reaches its maximum between 3 or 4 years. Ilmakunnas and Nurmi (2010) studied Finnish manufacturing firms' entry-exit dynamics and showed that approximately 25 percent of the plants that start exporting exit after the first year and the exit rate continue to be high for the first 5 years. Freund and Pieorola (2010) using firms in non-traditional agriculture sector of Peru found high exit rates during the first year. Tovar and Martinez (2010) for Colombian firms calculated that the average survival duration in the export markets is 3 months. Esteve-Perez et al. (2006) examined the survival of

Spanish manufacturing firms and reported that the median duration of export spells is 6 years and 25 percent of the firms that start exporting exit after the first year. Esteve-Perez et al. (2011) analyzed trade relationships by destination and concluded that firm-country trade relations are short-lived and 47 percent of spells end after the first year with the median duration of 2 years. Jaud and Kukenova (2011) examined the survival of African enterprises and found that the median spell duration is 1 year. Cadot et al. (2011) showed that the survival rate of the African exporters is considerably low; 59 percent of the export starters in 2001 dropped out by 2002.

An explanation for the contrary empirical findings to the theoretical implications has been proposed by Gullstrand and Persson (2012). By exploring core and peripheral markets with different sunk-costs, they showed that a theoretical model can predict the results of both literatures. The idea behind the theoretical model is neat. They defined the core markets as if the firms' most important export destinations and the importance of sunk-costs as well as the future returns in those markets are high. On the other hand, peripheral markets of the firms referred to as such that the importance of sunk-costs and expected future returns from exporting are low. They showed that firms tend to stay longer in their core markets (as implied by the sunk-cost literature) but not so decisive for the survival in peripheral markets. According to the authors, the main source of the puzzling results obtained from empirical survival analysis is the coverage of the data. While sunk-costs literature builds export decision on core markets, empirical duration literature uses data that covers both core and peripheral markets.

As it can be recognized, identifying exit and entry dynamics of the firms will provide important and distinct contributions. The first and foremost, it will provide additional insight for the exporting behavior of the firms. To our knowledge, this is the first and unique application for Turkish manufacturing sector. However, analysis in this section is not only provides insight about the entry-exit timing decision, but also provides important evidences for the changing export behavior of Turkish manufacturing firms. Lastly, focusing on the impact macroeconomic variables on the entry-exit

dynamics, we will contribute to real exchange rate-trade relation literature that contains quite mixed results.

5.5.1 Analyzing the data

The interest is to determine the factors that affect entry and exit dynamics of the firms. Hence our duration analysis consists of two stages; first modeling the duration until a firm becomes exporter and the other is to model for the survival of these export starters in international markets. Our dataset is suitable for converting it to survival-time data. Firms export status can be followed up over the observation period 1989-2010 and necessary variables required for the duration analysis can be derived. However, the follow up period for each firm, that is to say period during in which firms were under observation differs and the data set contains several problems which are common for survival data.

Among them, censoring is the most obvious one which prevents to have information about the exact duration of each spell. Our data set suffers from both left and right censoring. Some of the firms followed for a specific length of time but by the end of that time, the failure event has not occurred. This is known as right-censoring and the aim of the duration models is to handle this problem. Another censoring problem known as left-censoring arises when the event of interest occurs some time before the follow-up period. For exit dynamics this problem is abolished by considering only new exporters. For entry dynamics, no special treatment is applied due to the fact that most of the firms were already non exporters when they entered into the observation set and omission of these firms will lead to analysis with fairly small number of observation.

Another problem is the interruption of the data. Some firms disappear due to unknown reason and some other firms disappear for a while but then reports back to the study causing a gap in follow-up. This situation is named as interval truncation in survival literature. In our case, there are 1404 firms which constitute 16 percent of the total, with an interval truncated data. Those firms are excluded from the analysis. Among

this remaining 7344 firms, 1707 of them never export, 2279 of them always export and 3348 of them shift across the markets during the observation period at least once. The distribution of initial export status for the firms that shift across markets is as such that 2694 firms are non-exporters and 654 firms are exporters as they enter into the observation sample.

Table 5.9, excluded firm groups and the resulting number of firms that will be used for the corresponding models are given.

Table 5.9 Number of Firms Used in the Analysis

	Number of firms	Model 1	Model 2
Total	8738		
with interval truncated data	1404	(-)	(-)
remaining (after exclusion of firms with interval truncated data)	7334		
never export	1707		(-)
always export	2279	(-)	(-)
changes export status	3348		
non-exporter in the initial state	2694		
exporter in the initial state	654	(-)	(-)
Number of firms used in the analysis		4401	2694
Censored (No failure during the observation period)		1707 (38.8 %)	1447 (53.7 %)
Single failure		1930 (43.9%)	952 (35.3 %)
Multiple failure		764 (17.3%)	295 (16.0 %)

Source: Author's own calculations.
1. (-) indicates exclusion from the analysis.
2. Model 1 stands for the duration model for becoming exporter.
3. Model 2 stands for the duration model for the survival of new exporters in international markets.
4. Numbers given in the parentheses represents the percentage of the corresponding group in number of firms considered for each model.

The aim is to derive firm dynamics both for non-exporters and new exporters. Hence, in the first case, named as Model 1, the time to become exporter will be studied and the failure event is defined as to start export and hence those firms that always export and/or exporter at the initial observation period are excluded from the analysis. As a result, for Model 1, 4401 firms remained for the analysis (Figure 5.9). In the second case, named as Model 2, the survival of new exporters in international markets will be considered and the failure event is defined as ceasing the exporting

activity at least two consecutive years[23]. Firms that never exports, always exports and are exporter at the initial year of the observation period are excluded and 2694 firms left for Model 2 analysis (Figure 5.9)

The simplest and common way to model survival-time data is to consider only time-to-until first failure, that is to say single spell. In our data set, for Model 1, 17.3 percent of the firms and for Model 2, 16 percent of the firms experienced more than one failure event (Figure 5.9). However since the share of firms with multiple failures is considerably small, only the first failure events are considered and single spell data approach will be employed.

5.5.2 Empirical Approach in Survival Analysis

Survival analysis is first used in the medical researches for modeling the time to event data in which death or failure is considered as an event. Adaptation of this technique to the problems in economics and social sciences did not take long time. Survival data analysis requires different and special statistical treatment since they are not normally distributed and usually contains censored observations. The preliminary evaluation method in the survival analysis is the Kaplan-Meier method which is non-parametric and purely descriptive technique for estimating the survival functions. In order to investigate the magnitude and the direction of the impact of subject characteristics on the survival, duration models are used.

Nonparametric Estimation

The survivor function $S(t) = \Pr(T \geq t)$ denotes the probability of event duration to be at least t and is usually estimated non-parametrically using the Kaplan-Meier estimator. Assuming a sample contains n independent observations denoted as (t_i, c_i), $i = 1,2, \dots, n$ where t_i is the survival time and c_i is the censoring indicator variable taking on a value of 1 if failure occurred and 0 otherwise. Assume there are m<n recorded times of failures.

[23] In the previous section that tests the existence of sunk cost reveal that benefits of past export market participation do not depreciate fully immediately after the exit and firms that last exported three years earlier face re-entry costs. In the light of this information, failure event for the survival in export markets is defined as ceasing the exporting activity at least two consecutive years.

The rank-ordered survival times are denoted as t(1)<t(2)<…<t(m) and n_j denote the number of subjects at risk of failing at t(j) and d_j denote the number of observed failures. Then, the Kaplan-Meier estimator of the survival function is given as,

$$\hat{S}(t) = \prod_{t(i)<t} \frac{n_j - d_j}{n_j} \quad \textbf{(22)}$$

Parametric Estimation

Parametric models are continuous-time models in that they assume a continuous parametric distribution for the probability of failure over time. A general parametric duration model takes its starting point with the hazard rate in which gives the probability of failing in the next short time interval given that the subject survived until time t,

$$h(t) = \frac{f(t)}{S(t)} \quad \textbf{(23)}$$

where f(t) is the density function and S(t) is the survival function which represents the probability of surviving at least until time t.

Parametric estimation is carried out by the maximum likelihood estimation and observations are distinguished according to their contributions to the parametric likelihood. For a set of observations indexed by i, some observations can be complete, $C_i = 1$, that is to say the exact time of the failure is observed and its contribution to the likelihood is $f(T_i)$. Some other observations can be censored, $C_i = 0$, so that we only know that the observation survived at least to time T_i and their contribution to the likelihood is their survival function, $S(T_i)$. Hence, with this information a general parametric likelihood for the survival model is:

$$L = \prod_{i=1}^{n} \left(f(T_i)^{C_i}\left(S(T_i)\right)^{1-C_i}\right) \quad \textbf{(24)}$$

And the corresponding log-likelihood is:

$$\ln L = \sum_{i=1}^{n} \{C_i \ln(f(T_i)) + (1 - C_i)\ln(S(T_i))\} \quad \textbf{(25)}$$

To include covariates (X), the distribution and survival functions are written as condition on X. Different kinds of hazard models may be obtained by making different assumptions about the baseline hazard functions. The most popular parametric models are those that uses exponential and Weibull distributions.

The exponential model is the simplest parametric duration model. It assumes that the failure time random variable, T_i, follows exponential distribution with a parameter λ_i that depends on covariates x_i. Then, the hazard function for the exponential model can be represented as:

$$h(t, x, \beta) = h_0(t)\exp(\beta x) \quad \textbf{(26)}$$

Exponential model assumes that the baseline hazard is constant over time which implies that the hazard rate be the same for any two subjects with the same covariates. Given hazard function, the corresponding survival and density functions are used to construct the log-likelihood function for the observed data and using maximum likelihood method parameters are estimated.

In spite of frequent use of Exponential distribution constant hazard assumption is fairly restrictive. The Weibull model allows different shapes for the hazard functions which increase the capacity of capturing the features of real data. The Weibull model asserts that the hazard rate is[24]:

$$h(t, x, \beta) = pt^{p-1}\exp(\beta x) \quad \textbf{(27)}$$

where p stands for shape parameter, t is the observed duration data and x denotes a vector of explanatory variables. The shape parameter, p,

[24]In the literature diffent parameterizations of this model exist. The given parameterization belongs to Kiefer.

characterizes how the hazard function changes as a function of time. When, p is equal to one, the Weibull model reduced to the exponential model and it represents the case in which the hazard rate is constant over time which is said to have no memory. For the values of p between 0 and 1, the hazard ratios are decreasing monotonically over time and negative duration dependence is observed. For the values of p that are greater than 1, the hazard ratios are increasing monotonically over time and positive duration dependence is implied. This flexibility of the Weibull model can be considered as the main reason for its popularity in the survival analysis literature.

5.5.3 Explanatory Variables

In order to ensure consistency and coherence, same firm specific covariates are considered as in the previous econometric techniques. In order to compare the Kaplan-Meier survival functions for different levels the covariates are converted into dummy variables by comparing them with the median values. Median values are calculated for each sector at the given year separately by assuming each variable can possess sectoral differentiation. After obtaining the median values, firm specific variables are compared with those medians and the covariates are constructed as follows.

For the productivity variable, the firm i's productivity level $\text{Productivity}_{it} = \left(\frac{\text{Net Sales}_{it}}{\text{Total number of employees}_{it}}\right)$ that is operating in sector s is considered as low at time t if it is less than the sector median productivity of at time t, $Productivity_{st}^{Median}$.

$$\text{Productivity}_{it} = \begin{cases} 0 \text{ Low if Productivity}_{it} < \text{Productivity}_{st}^{\text{Median}} \\ 1 \text{ High if Productivity}_{it} \geq \text{Productivity}_{st}^{\text{Median}} \end{cases}$$

The credit constraint of the firm i that is operating in sector s at time t, is considered as low if the level of the constructed credit constraints variable, $\text{Credit Constraint}_{it} = \left(\frac{\text{Total Financial Liabilities}_{it}}{\text{Total Liabilities}_{it}}\right)$, is greater than the sectoral median level of credit constraint at time t, $\text{Credit Constraint}_{st}^{\text{Median}}$, and assumed to suffer low level of credit constraint otherwise.

$$\text{Constraint}_{it} = \begin{cases} 0 \text{ Low if Credit Constraint}_{it} > \text{Credit Constraint}_{st}^{\text{Median}} \\ 1 \text{ High if Credit Constraint}_{it} \leq \text{Credit Constraint}_{st}^{\text{Median}} \end{cases}$$

The firm's capital intensity is classified as low if the constructed capital intensity variable,$\text{Capital Intensity} = \left(\frac{\text{Tangible Assets}_{it}}{p_t * \text{Number of employee}_{it}}\right)$, is less than the median capital intensity level and high if it exceeds the median level, $\text{Capital Intensity}_{st}^{\text{Median}}$.

$$\text{Capital}_{it} = \begin{cases} 0 \text{ Low if Capital Intensity}_{it} < \text{Capital Intensity}_{st}^{\text{Median}} \\ 1 \text{ High if Capital Intensity}_{it} \geq \text{Capital Intensity}_{st}^{\text{Median}} \end{cases}$$

The profitability level, $\text{Profitability}_{it} = \left(\frac{\text{Operating Profits}_{it}}{\text{Net Sales}_{it}}\right)$, at time t of the firm i that is operating in sector s is classified as low if the level of the constructed profitability variable is less than the sector s's median at time t, $\text{Profitability}_{st}^{\text{Median}}$ and as high otherwise.

$$\text{Profitability}_{it} = \begin{cases} 0 \text{ Low if Profitability}_{it} < \text{Profitability}_{st}^{\text{Median}} \\ 1 \text{ High if Profitability}_{it} \geq \text{Profitability}_{st}^{\text{Median}} \end{cases}$$

The firm's R&D intensity is classified as low if there is no R&D expenditures at time t and as high if the firm i expends for R&D.

$$\text{RD}_{it} = \begin{cases} 0 \text{ Low if RD Expenditure} = 0 \\ 1 \text{ Low if RD Expenditure} > 0 \end{cases}$$

Firm's i quality competition (endogenous sunk-cost) is classified as low at time t that is operating at the sector s if the level of the constructed quality variable, $\text{Quality}_{it} = \left(\frac{\text{Marketing,Advertising and Distribution Expenses}_{it}}{\text{Operating Expenses}_{it}}\right)$, is less than the median level and as high otherwise.

$$\text{Quality Competition}_{it} = \begin{cases} 0 \text{ Low if Quality}_{it} < \text{Quality}_{st}^{\text{Median}} \\ 1 \text{ High if Quality}_{it} \geq \text{Quality}_{st}^{\text{Median}} \end{cases}$$

In the duration models, for efficiency measures productivity[25] and profitability variables are included; for liquidity constraints of the firms

[25] In order to ease the interpretation of the coefficient estimates, dummy variable that shows the productivity level of the firms relative to the sector median is used.

credit constraint and liquidity variables are considered; for quality measures capital intensity, R&D expenses and marketing, advertisements and distribution expenses[26] variables are used. Size dummies and industry dummies according to technology are also included as the firm-specific control variables.

In addition to the firm specific covariates macroeconomic variables such as real exchange rate, domestic, foreign demands and crisis dummies for 1994, 2001 and 2008 are included into the duration models. The inclusion of real exchange rate serves two purposes. Firstly, it will provide better understanding in export behavior of the Turkish manufacturing firms. The secondary aim is to contribute to real exchange rate-trade relation literature. Following Besedes and Prusa (2007), the entry and exit dynamics are associated with the extensive and intensive margins of trade respectively and the firm-level response of trade margins to the changing exchange rate will be explored within the duration analysis.

Crisis dummies are presumed to embody information about the implemented strategic action of the firms to the crisis. Pencarelli et al. (2010) categorized possible responses of the enterprises to the crisis in three groups; (1) Offensive strategies that include both concentration within the sector and diversification through outside the sector that the firm operates (2) defensive and waiting strategies aim to protect market position and competitive advantage. The typical actions of the firms that apply this strategy are to focus on traditional activities and to cut investment. (3) Strategies of contraction contain usually two steps. First firms that adopt this strategy try to improve situation by various ways however if the situation remains difficult then firm chooses among three alternatives, to to sell or exit the market or bankruptcy. In the entry process, if crisis are found to be positively affecting the hazard rate then this implies that occurrence of the crisis shortens the waiting time to become exporter. Hence, this can be considered as firms prefer offensive strategies and by entering into export markets they try to improve their competition power. In

[26] For quality measure variables, dummy variable versions of those variables that are given above are preferred.

the case in which crises are found to be negatively affecting the hazard rate which implies that occurrence of the crisis lengthened the time to become exporter. Accordingly, this implies firms' preference is in favour of defensive strategies during the crisis and they prefer to wait for the settlement of better economic conditions.

5.5.4 Empirical Results for Entrance into Export Markets

In this section, entry dynamics into export markets are going to be investigated via duration analysis. In Table 5.10, descriptive statistics for the duration of becoming exporters in years are given. The minimum waiting duration for becoming exporter is 1 year and the maximum is 22 years whereas the median waiting time for the entry is 4 years.

Table 5.10 Descriptive statistics for the duration of becoming exporters

			Per Subject		
	Total	Mean	Min.	Median	Max.
Number of Subjects	4 401				
Number of Records	19 209	4.4	1	4	22
Failures	2 694				

Source: Author's own calculations.

Kaplan-Meier Analysis

Nonparametric analysis for the duration of becoming exporters is carried out with the estimation of the survival function with the Kaplan-Meier estimator. In Figure 5.9, the survival function for non-exporters; more precisely the probability of continuing to be non-exporter is given. Only 19 percent of the firms start to export within the first year of the follow-up period. This can be regarded as a sign for the importance of sunk-costs. Ilmakunnas and Nurmi (2010) estimated the corresponding ratio as 50 percent for Finnish plants and they interpreted this high participation as an indication of relatively low sunk-costs.

Turning to the survival function, it can be concluded that the entry dynamics displays positive duration dependence. This is drawn from the

fact that survival function is downward sloping with an increasing slope which implies firms face a large probability of failure as they survive.

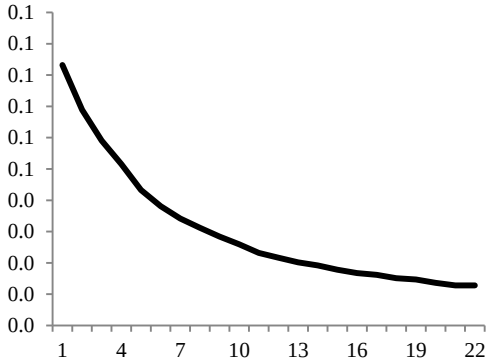


Figure 5.9 Kaplan-Meier Survival Estimate For the Firms To Become Exporter

Figures from 5.11 through 5.18 show how the other variables relate to the survival of non-exporters. In particular in Figure 5.10, the survival functions are given for size groups. As the size of the firm increases the survival of non-exporter decreases. The probability of becoming exporter for large firms is fairly large and the duration for becoming exporter is considerably shorter compared to micro and small firms. Approxiamtely 35 percent of the large firms become exporter at the first year whereas this ratio is 12 percent, 14 percent and 26 percent for micro, small and medium sized firms respectively. Survival curves for low and high productive firms are given in Figure 5.11, and according to the Kaplan-Meier estimates the duration for becoming exporter is shorter for firms with high productivity level as expected. Survival curves by profitability is given in Figure 5.12 and the Kaplan-Meiere estimates imply that firms with higher profitability becomes exporter in a shorter time period. In Figure 5.13, there is presented the survival curves for the levels of credit constraints and the waiting time to become exporter is longer for the credit constrained firms. Figure 5.14 shows the survival curves of the firms according to the liquidity level and the survival time of the firms as purely domestic is shorter for more liquid firms. Likewise, Figure 5.15-Figure 5.17 display the survival curves for the R&D expenses, capital intensity and marketing expenses of

the firms. According to the estimated Kaplan-Meier estimates, we can conclude that there is significant difference in probabilities of becoming exporter between the firms that invest to quality and the firms that do not invest.

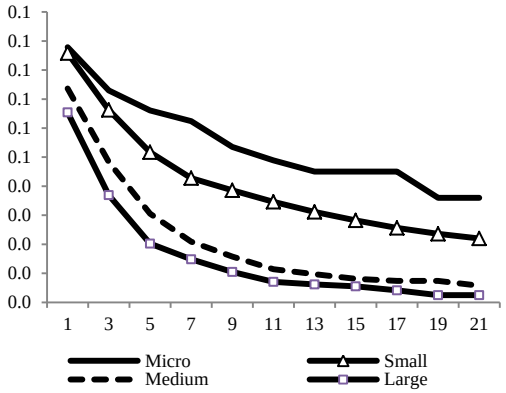


Figure 5.10 Survival and Size

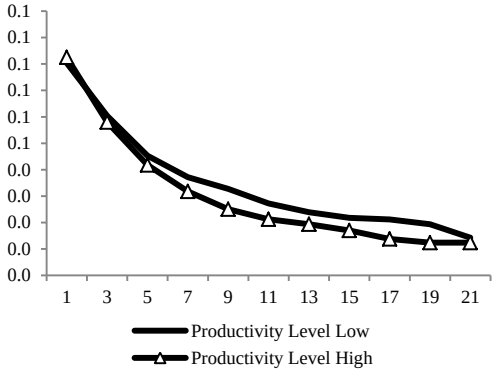


Figure 5.11 Survival and Productivity

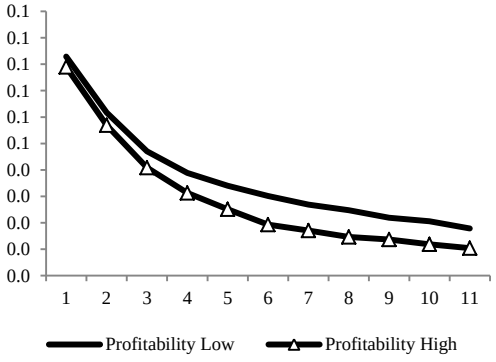


Figure 5.12 Survival and Profitability

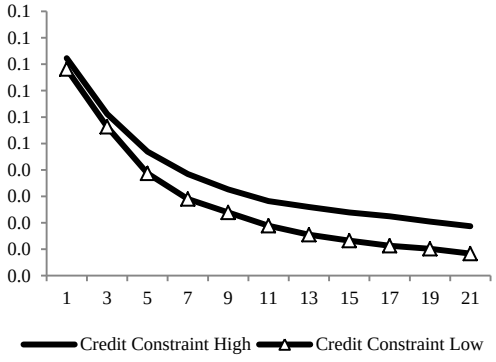


Figure 5.13 Survival and Credit Constraint

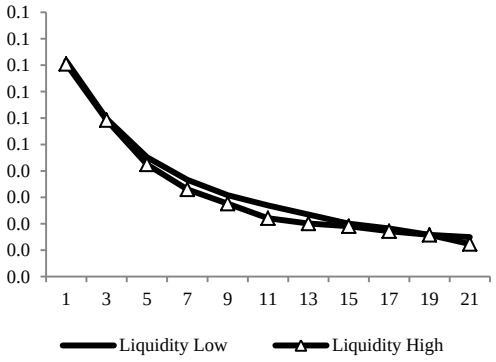


Figure 5.14 Survival and Liquidity

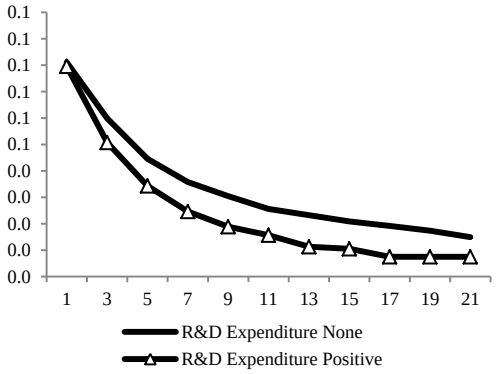


Figure 5.15 Survival and R&D Intensity

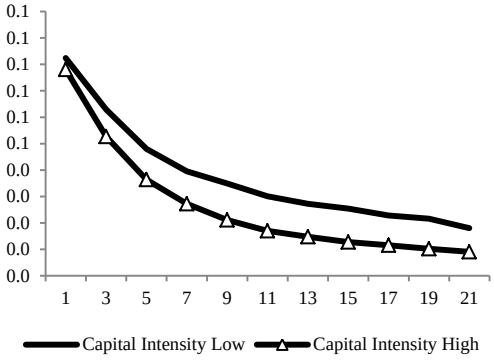


Figure 5.16 Survival and Capital Intensity

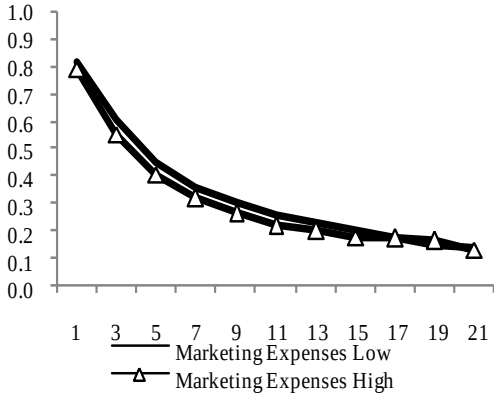


Figure 5.17 Survival and Marketing Expenses

Descriptive analysis for the duration of becoming exporter reveals that waiting time to become exporter for the firms with better performance measures is shorter. Especially size, productivity, competitiveness, profitability, credit constraints, capital intensity and R&D expenses of the firms seem to be influential on the waiting time of the firms to become exporter. Better performance on these variables increases the probability of becoming exporter and shortens the waiting time. Shortly, all these findings point out self-selection of the exporters from another perspective.

Kaplan-Meier survival functions have explored unconditional associations between the variables of interest and firm survival. In the next section, the impact of these variables is going to be analyzed in a conditional framework.

Determinants of time to become exporter

The results based on Weibull model are presented in Table 5.11. The first and the second column contain the estimated coefficients and their standard errors. In the last column, corresponding hazard ratios are given.

Table 5.11 Estimation Results for the Export Market Entry Time

	Coefficient	Standard Error	Hazard Ratio
Micro	-0.92***	0.08	0.40
Small	-0.53***	0.04	0.59
Large	0.17**	0.07	1.19
Medium-low	-0.19***	0.05	0.83
Medium-high	0.17***	0.05	1.19
High technological	0.45***	0.14	1.56
Productivity	0.12***	0.04	1.13
Credit constraint	0.23**	0.10	1.25
Capital Intensity	0.08***	0.02	1.09
Profitability	-1.07***	0.08	0.34
Liquidity	0.06	0.11	1.06
R&D Expenses	0.02	0.08	1.02
Marketing Expenses	0.07	0.05	1.07
Real Exchange Rate	0.01***	0.00	1.01
World Demand	-0.01***	0.00	0.99
Domestic Demand	-0.01*	0.00	0.99
Dummy for 1994 Crisis	0.17**	0.08	1.19
Dummy for 2001 Crisis	-0.15	0.15	0.86
Dummy for 2008 Crisis	-1.33***	0.32	0.26
Shape parameter (ln p)	**0.19*** **	**0.02**	
Number of observations	4378		
Number of failures	2694		
Time at risk	19208		
Log Likelihood	-5372		

Source: Author's own calculations.
(1) Medium sized firms are the base group for the size dummies and low- technological intense sector is the base group for the technological intense sector dummies.
(2) *, ** and *** indicates significance at 10, 5 and 1 percent levels respectively.

Starting with the shape parameter, positive and statistically significant coefficient is estimated as expected. As it was mentioned before, positive shape parameter implies positive duration dependence and it shows that as time goes the probability of failure (to become exporter) increases which implies waiting time to become exporter shortens. A rational for positive duration dependence for becoming exporter comes from literature and our previous findings about the self-selection of the exporters. According to passive learning model of Jovanovic (1982), each firm starts to business with an initial level of efficiency that is unknown during the pre-

entry period. Over time, firms learn about their efficiency levels and firms with higher efficiency level, grow and survive whereas less efficient firms choose to exit. Hence, according to passive learning model as firms survive and get older, they become more efficient. In the previous section, we concluded that better firms self-select into export markets. Therefore, implication of the passive learning model and finding supporting self-selection of the exporters explains the expected positive duration dependence. Before starting to the discussion of the impact of the covariates, it would be useful to mention the implication of estimated coefficient sign for the hazard rate and expected duration. Positive estimated coefficient indicates that the hazard of the event increases as the value of the variable increases implying shorter expected duration. Conversely, negative estimated coefficient indicates that the hazard of the event declines as the value of the variable increases implying longer expected duration.

Estimation results are to a large extent are consistent with the previously obtained empirical evidences. For the size dummies medium sized firms is chosen as the base category and our results show that the hazard rate for micro firms is 62 percent (1-0.38) lower than that of medium sized firms. For small sized firms the hazard rate is 43 percent lower and for large firms the hazard rate is 23 percent higher than that of medium sized firms. Therefore, estimation results show that as size increases the hazard rate increases so that the expected duration to become exporter decreases. When other things are equal, the hazard rate of firms with high productivity level is 17 percent higher than that of the firms with low productivity level. This estimate suggests that expected duration to become exporter decreases as firms become more productive.

Credit constraint of the firms is found to be another significant determinant for the duration of becoming exporter. The hazard rate difference between fully credit constrained firms and firms with no credit constrained firms is 29 percent and this implies firms that can find external financial sourcing wait shorter for becoming exporter. This finding is consistent with the theoretical prediction and empirical findings of Chaney

(2005). Chaney developed Melitz (2003) heterogeneous trade model by introducing credit constraint exporters and he showed that in the presence of sunk-costs and liquidity constraint, only those firms that have sufficient liquidity are able to export. Efficient firms are able to generate liquidity either via domestic sales or via financial borrowings. Therefore, significance of the variable (credit constraints) that is constructed for measuring borrowing power of the firm from financial sources provides the importance of sunk-costs from different perspective.

The relation between the capital intensity and the hazard rate is found to be positive and significant that implies as the capital intensity increases duration declines. The impact of the profitability of non-exporting firms on the hazard of becoming exporter is found to be statistically significant and negative. This implies that as the profitability in domestic market increases the probability of being exporter declines. Although, it seems as if counter-intuitive a possible rational for this negative relation between profitability and the hazard of becoming exporter is the risk-averse behavior of non-exporters. To start exporting is risky since export markets are more competitive and an anticipated profit from exporting is uncertain. Therefore, for a risk-averse non-exporter, higher profitability will cause disincentive to start exporting and this will lengthen the duration of becoming exporter.

Besides firm specific factors, there are also control variables aiming to capture macroeconomic changes. Starting with the real exchange rate, this variable has a negatively significant coefficient as expected. This implies favorable exchange rate movements (decrease in the real exchange rate so depreciation) leads to increase in the hazard rate and decrease in the expected duration for becoming exporter. Therefore, this shows that exchange rate depreciations lead to an increase in the extensive margins of the trade. Estimated coefficients for crises dummies reveal that exporting behavior of the firms differ under different crises. According to the estimation results, occurrence of 1994 economic crisis leads to increase in the hazard rates of non-exporters (shortens the duration); occurrence of 2001 and 2008 crisis reduces the hazard rate (lengthened the duration).

Interpretation of these results with the findings obtained in the previous section will make more sense in understanding the mechanism. In the previous section, it has been found that in 1994 crisis the sunk-costs for export market entry declines and the propensity to become exporter increases. Here we observed that those firms that are waiting to become exporter bring forward their decisions with the occurrence of 1994 crisis. On the other hand, for the 2008 crisis the situations is reversed, and with the increase of the sunk-cost, propensity to become exporter decreases and firms prefer to postpone export market entry decision. For the case of 2001 crisis, no statistically significant difference in the sunk-costs observed, however, it is well known that 2001 crisis is characterized by severe credit crunch. Hence, credit constraints hindered the entry of potential exporters into export markets. This can be regarded as another indication for the importance of the sunk-costs. When the impacts of the crises are evaluated within strategic actions framework, while the firms during 1994 crisis on average adopted offensive strategy, during 2001 and 2008 crises, they preferred defensive wait-and-see strategy.

To summarize for larger, more productive, more capital intensive, more competitive, less credit constrained firms that are operating in technologically more intense sectors, the hazard rate is higher and consequently the waiting time to become exporter is shorter. This can be regarded another indicator for the self-selection of the better firms into export markets. Apart from firm-specific factors, favorable exchange rate movements foster export market participation.

Although becoming exporter is considered as a challenging process, the actual challenge for firms starts with the entry into export markets. Export markets are more competitive and risky. Hence, analyzing exit dynamics is at least as important as analyzing the entry dynamics.

5.5.5 Empirical Results for the Survival in Export Markets

In the previous section, the factors that influence the duration of becoming exporter are determined. In this section, exit dynamics of the export starters will be analyzed. Table 5.12 gives the description of the

survival data. For the observation period 1989-2010, there are 2694 firms that start to export and 906 of this new export starters which corresponds to 33.6 percent cease to export during the observation period. The mean survival duration is found to be 6.4 years and the median duration is 4 years (Table 5.12).

Table 5.12 Description of the Survival-Time Data

Model 2: Survival of the New Exporters in International Markets					
		Per Subject			
	Total	Mean	Min.	Median	Max.
Number of Subjects	2 694				
Number of Records	17 176	6.4	1	4	21
Failures	906				

Source: Author's own calculations.

The Kaplan-Meier survival analysis shows that approximately 18 percent of the new exporters cease to exporting after the first year. When compared with the other country examples, the survival rate seems to be higher for the Turkish manufacturing firms[27]. The failure of the new exporters becomes considerably modest after the first year and the survival rate in export markets for the new exporters fairly high (Figure 5.18).

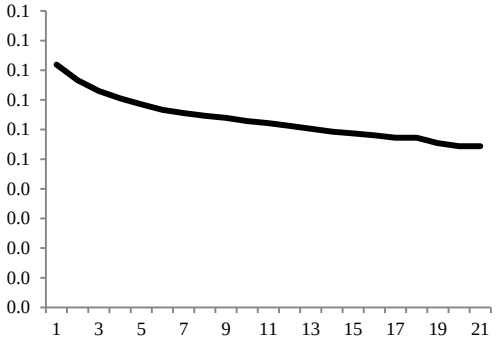


Figure 5.18 Kaplan-Meier Survival Estimate In The Export Markets

[27] For Canadian establishments this ratio is approximately 33 percent (Sabuhoro and Gervais, 2004). For Finnish manufacturing firms the ratio is 25 percent (Ilmakunnas and Nurmi, 2010). For Spanish firms 25 percent o the firms that start exporting exit after one year (Esteve-Perez et al.,2007). Cadot et al. (2011) showed that 59 percent of the African export starters in 2001 dropped out by 2002.

Descriptive analysis (Figure 5.19-Figure 5.26) reveals that survival in the export markets is higher for the firms with better performance. The most distinct difference observed in the size of the firms. While the survival of the large firms is considerably high, for micro sized firms, survival in the export markets seems to be very difficult.

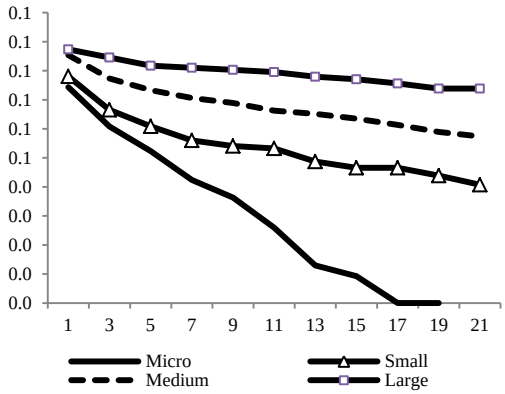


Figure 5.19 Survival in Export Markets and Size

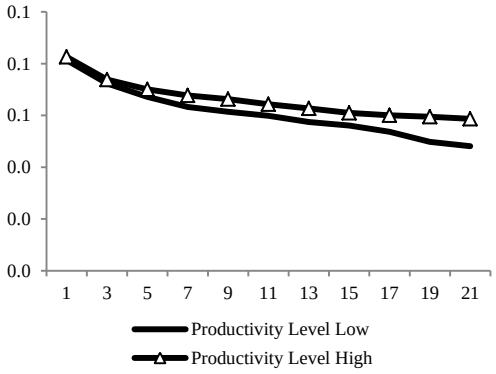


Figure 5.20 Survival in Export Markets and Productivity

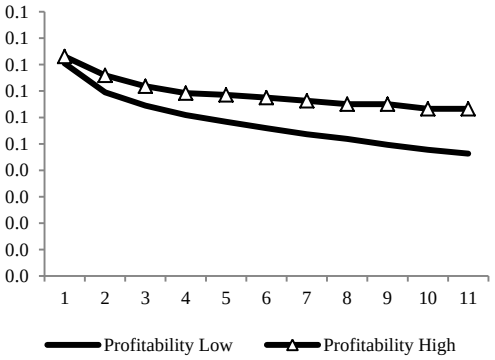


Figure 5.21 Survival in Export Markets and Profitability

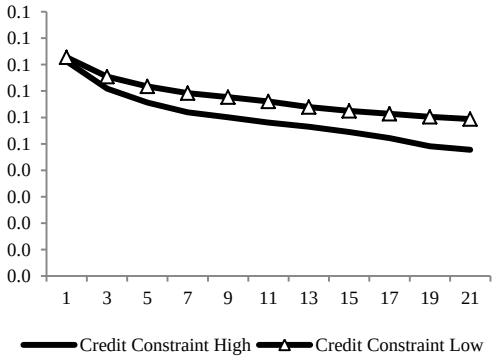


Figure 5.22 Survival in Export Markets and Credit Constraint

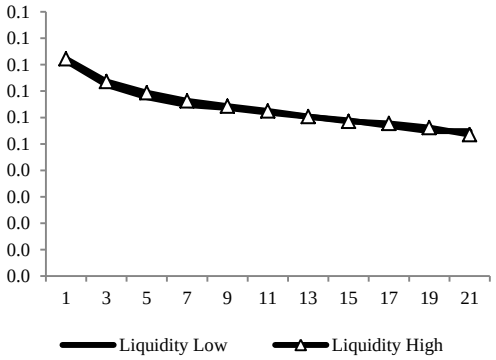


Figure 5.23 Survival in Export Markets and Liquidity

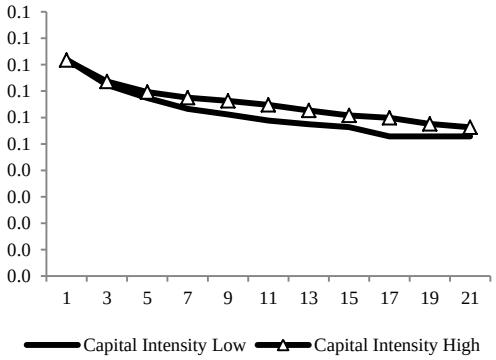


Figure 5.24 Survival in Export Markets and Capital Intensity

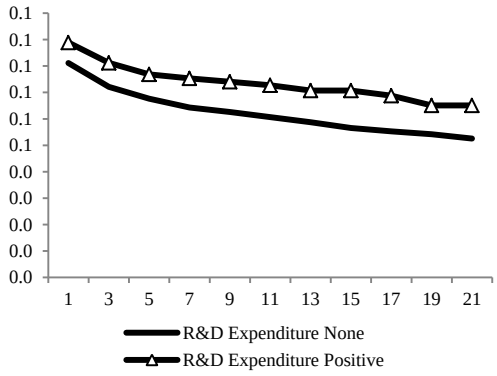


Figure 5.25 Survival in Export Markets and R&D Expenses

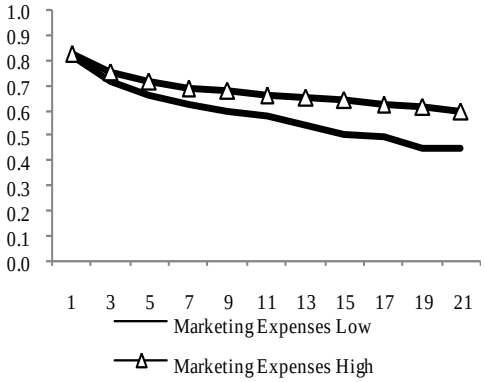


Figure 5.26 Survival in Export Markets and Marketing Expenses

Using Weibull model, the export market survival of new export starters is examined and the results are presented in Table 5.13.

Table 5.13 Estimation Results for the Export Market Survival of New Exporters

	Coefficient	Standard Error	Hazard Ratio
Micro	1.09***	0.14	2.88
Small	0.56***	0.07	1.74
Large	-0.63***	0.14	0.53
Medium-low	-0.09	0.08	0.90
Medium-high	-0.19**	0.09	0.83
High technological	-0.06	0.23	0.97
Productivity	-0.23***	0.07	0.81
Credit constraint	-1.01***	0.18	0.37
Capital Intensity	-0.02	0.03	0.97
Profitability	-0.26***	0.07	0.42
Liquidity	0.00	0.21	0.99
R&D Expenses	-0.38***	0.12	0.67
Marketing Expenses	-0.35***	0.07	0.69
Real Exchange Rate	0.00	0.00	1.00
World Demand	-0.02***	0.01	1.01
Domestic Demand	0.01	0.00	0.99
Dummy for 1994 Crisis	-0.15	0.14	0.86
Dummy for 2001 Crisis	-0.27	0.17	0.74
Dummy for 2008 Crisis	0.94***	0.18	1.33
Shape parameter (ln p)	**-0.12*** **	**0.03**	
Number of observations	2693		
Number of failures	904		
Time at risk	17167		
Log Likelihood	-2721		

Source: Author's own calculations.
(1) Medium sized firms are the base group for the size dummies and low- technological intense sector is the base group for the technological intense sector dummies.
(2) *, ** and *** indicates significance at 10, 5 and 1 percent levels respectively.

The estimated shape parameter is statistically significant and negative which implies as time goes the probability of ceasing exporting activity declines, in other words, the survival chance in export markets increases. Negative duration dependence for the export market survival is consistent with the theoretical predictions of the learning models. Both active and passive learning theories predict that the risk of exit from export markets reduces over time (Jovanovic, 1982; Ericson & Pakes, 1995).

Starting the investigation of firm specific factors with the efficiency measures reveal that there is a positive relation between the efficiency and the survival of the new exporters. To be more precise, the hazard is 191 percent higher for micro, 73 percent higher for small and 46 percent lower for large firms when compared with medium sized firms' hazard. This implies expected duration increases by size and survival of larger firms in export markets becomes higher. This finding is consistent with the majority of other studies and seems to reflect economies of scale advantage. The

hazard rate of the firm with higher productivity level is 20 percent lower than that of a firm with low productivity level. This implies that for more productive firm the probability of surviving is higher and surviving time is longer. Positive correlation between productivity and export activity of the firms is well established both in the theoretical and empirical strands. Engaging export activity is costly and export markets are more competitive therefore only the most productive firms can accomplish those challenges.

Profitability of the firms is found to be another statistically significant covariate that affects the survival of the exporters. As exporters become more profitable the survival probability and duration increases. In addition to efficiency measures, credit constraints of the firms are found to be statistically significant determinant for the survival of new exporters in export markets. The estimated coefficient for credit constraint is negative and it implies relaxation of constraint (increase in the constructed variable) reduces the hazard ratio and consequently increases the survival duration in export markets. This finding emphasizes the situation in which the external financing source is not only important for the potential exporters but also important for the incumbent exporters. This finding is consistent with the theoretical foundation of the Manova. As it was mentioned before, Manova setting assumes that both exporters and export starters used external sources for financing. While export starters used those external sources for financing sunk-costs, existing exporters are using external sources for financing variable costs of export

The impacts of covariates on exit dynamics are consistent with the entry dynamics. They have significant symmetric effects on entry and exit dynamics. The duration for becoming exporter is shorter and once they enter into export markets the survival is longer for larger, more productive, more profitable and less credit constraint firms.

Different from entry dynamics, quality investment is found to be significant for the survival of the new exporters. Firms with quality investment that is to say with R&D, marketing and advertisement expenditures face lower hazard and the survival in export markets is higher. Empirically it has been shown that quality investment (R&D, marketing,

advertisement) is considered as a tool for exporters in resisting great competitive pressure of international markets and it enhances export survival chance (Kleinschmidt & Cooper, 1990; Kotable, 1990). It seems that quality investment is not pre-requisite for becoming exporter but it is crucial for the survival of new exporters in international markets. This is mainly due to the fact that international markets are more challenging arena for the firms which forces firms to take into account quality by attaining efficiency.

Turning attention to the role of macroeconomic conditions on survival reveals that among macroeconomic variables only foreign demand is found to be statistically significant covariate that affects the survival of the exporters.

When crises are considered it is observed that 2008 crisis affected negatively the survival of the exporters. Sharp contraction of foreign demand forced some firms to exit the export markets. Although for 1994 and 2001 crisis estimated coefficients are negative implying increasing survival duration, they are not statistically significant. real exchange rate and domestic demand has no statistically significant impact on the survival of new exporters. Insignificant estimated coefficient for the real exchange rate is contrary to general beliefs. Turkish exporters frequently express their complaints about the overvaluation of domestic currency. However, our findings show that these beliefs are now obsolete and Turkish manufacturing firms have realized the fact that the lifeblood of export performance is not only the price competition arise from currency undervaluation. With this awareness, they started to invest non-price competition that is to say quality production. This is crucial and necessary action for Turkish exporters since it no longer seems possible for them to be able to rely on price competition with undervalued currency with the integration of China and India into world market. Therefore estimation results can be interpreted as in order to off-set competition pressure coming from these tough competitors, Turkish manufacturing firms choose to upgrade quality of the products by investing to R&D, marketing and advertisement.

5.6 Summary of the Results

This chapter was motivated by the fact that although importance of exports for the Turkish economy has been noted, studies considering recent empirical developments that emphasized firm heterogeneity are fairly limited for the case of Turkey. In this chapter, a wide range of econometric tools is used to understand export behavior of the Turkish manufacturing firms in a comprehensive way. The main focus is to understand the source of observed export premium, to assess the importance of sunk-costs and to evaluate the entry and exit dynamics. In each section a series of consistent and complementary conclusions are drawn and those conclusions provide comprehensive picture of the export behavior of the Turkish manufacturing firms. Moreover, by focusing on macroeconomic variables, especially to real exchange rate considerable contribution is provided to the exchange rate-trade relation literature that contains quite mixed results with the macro-data.

To summarize briefly the obtained results: The descriptive analysis and simple regression applications show the superiority of the exporters consistent with the other studies. Econometric analysis used to explain the source of this observed performance differences between exporters and non exporters and the main findings can be summarized as follows: First, the results strongly support both the self-selection and learning-by-exporting hypothesis in which implies bi-directional casual relation between export activity and firm performance. It is found that while better firms become exporter, at the same time, export activity improves firm performance. The other important finding is the notable impact of previous export status on current export decision which generates strong persistency in export status that is attributed to the existence of sunk-cost. Firms' entry exit dynamics reveals the fact that larger, more productive and less credit constraint firms can enter export markets in a shorter time period that confirms self-selection and existence of sunk-costs from different perspective. Moreover, it is concluded that although quality investment is not pre-requisite for the entry, it is crucial for the survival of new exporters in international markets.

The estimation results as a whole showed the importance of the size on the export behavior of the Turkish manufacturing firms. The main conclusion is that the probability of entry into export markets and then survival probability of the micro, small and medium sized (MSM) firms is fairly low. Moreover, when the impact of crises investigated, it is observed that while the most productive and large incumbent exporters are able to overcome the adverse effects of disruptions, some of the MSM exporters cannot cope with the crisis and they are forced to exit the export markets. Besides, the consequences of the crisis are worse for some of the MSM purely domestic producers; the least productive ones disappear. However, SMEs play a particularly important role for the Turkish economy due to the fact that SME's are the predominant source of employment. Therefore, protective policies for the SME exporters will provide support to withdrawing chronic high unemployment rates downwards which is the biggest problem of the Turkish economy.

Another important finding of this thesis is the importance of credit constraints on export behavior. Credit constraint which is an indicator for the accessibility of the external financing sources plays crucial role on the export participation decision, entry-exit dynamics and export volume decisions of the firms. Even for large, productive and profitable firms, export behavior depends heavily on credit constraints. Therefore, in order to encourage firms for export market participation, to increase the survival rate of the new export starters and also to increase the export volume, more effective measures should be implemented to allow easier access to financial sources. For Turkey, since alternative financial instruments are not well developed, banking sector constitutes the backbone of the external financing sources. The prerequisite for motivating banks to lend to companies is to provide stable economic conditions. Under unstable economic conditions, banks prefer to purchase government bonds and then make loans only to large firms in order to protect themselves. For this reason, the health of the banking sector and its willingness to provide credit, especially to SMEs, has great importance. Healthier banking system has been attained at a great extent with the Banking Sector Reconstruction

Programme that was launched after the crisis in May 2001. However, the reluctance of banks to provide loans to the enterprises (especially to SMEs) is still a problem. The main reason for the reluctance of the banks in providing credits to SMEs is the lack of healthy and reliable evaluation mechanism for the default risks of credits. Government should encourage banks to develop an objective evaluation mechanism. Moreover, alternative financing tools can be developed.

Another important variable that is found to be statistically significant in general is the non-price competitiveness measures (R&D and marketing expenses). Moreover, it is important to highlight that contrary to general belief, the impact of exchange rate on export behavior is fairly limited when compared with the other competitiveness measures. Therefore, competitiveness of the firms should be increased via policies that contain more structural changes in place of being obsessive about the undervalued currency policies. Especially for increasing the survival rate and survival duration of the existing exporters, quality competition plays crucial role. Quality competition can be attained by investing to marketing and advertisement. Nowadays with the increasing use of Internet, marketing and advertisement activities came to be done more quickly and easily. Therefore, firms should be informed about the possible benefits of Internet usage and they should be encouraged for increasing their information and communication technology usage capacities.

Negative relation between the technological sophistication and the export volume and also negative impact of the capital-intensity on export volume is attributed to the comparative advantage of Turkey in low-tech products. However, it is important to note that Turkey's comparative advantage in export markets has been under threat with the entry of China and India in the world market. To be prevailing against China or India in price competition is unlikely for Turkey. In order to preserve export market share, government should encourage Turkish manufacturing firms either to focus on upgrading non-price competition power without changing sector or to specialize in more sophisticated sectors.

Estimation results point out significant impact of macroeconomic conditions on the export behavior of the firms. While exchange rate developments are found to have important role on the export market participation decisions, no particular impact on the export decisions of the incumbent exporters is observed. This is interpreted as the awareness of the exporters related with the quality production.

Estimation results show the importance of crisis impacts on export behavior of the firms. The crisis dummies are found to be statistically significant for export decision, entry and exit dynamics of the firms. Dynamic discrete choice model estimation results imply that with the occurrence of 1994 crisis the importance of sunk-costs declined whereas with 2001 and 2008 crisis the importance of sunk-costs increased. Accordingly, 1994 (2001 and 2008) crisis can be regarded as positive (negative) shock to the fixed exporting cost. Therefore, with the reduction of the fixed cost in 1994, the export propensity increased and the waiting time to become exporter increases. Contrarily, with the increase of the fixed costs in 2001 and 2008, the propensity to be exporter declines and the waiting time to become exporter increases. This is consistent with the implication of the Chaney model. As it was noted in Chaney (2005), as fixed costs of export declines, the export behavior of the non-exporting firms alter and more firms start to export. This is considered as the adjustment of extensive margin to the changing fixed trade costs. Moreover, another prediction of the Chaney model is that the changing fixed trade costs is only affecting the extensive margin of trade but not have any impact on the behavior of the existing exporters. However, in the survival analysis we concluded that occurrence of the crises significantly affects the export behavior of the existing exporters. Therefore, again referring to Chaney model, we can say that crises not only change the fixed trade costs but also led to changes in the variable trade costs and simply we can say that crises led to changes in the trade barriers. Recent theoretical and empirical literature focuses on the adjustment mechanism of export margins as opposed to changing trade barriers. This is the main motivation for the formation of the next chapter. The next chapter focuses on export behavior of the firms under different

crisis. The impact of crisis on trade margins will be explored by considering export market participation decision (extensive margin of export) of pre-crisis non-exporters and exporters and export volume decision (intensive margin of export).

CHAPTER 6

EXPORT BEHAVIOR OF TURKISH MANUFACTURING FIRMS UNDER CRISES

The main concern of recent firm-level trade literature is the detection of credit constraint-export behaviour relation. This issue has been considered both theoretically and empirically. The adverse effect of credit constraint on extensive margin of export is widely accepted but its impact on intensive margin is ambiguous. Chaney (2005) and Manova (2008) is two theorists that implicate credit constraint into Melitz model and show the importance of credit constraints on firms' export decisions and dynamics. The prediction of Chaney and Manova models about the extensive margin of export is same; the probability of becoming exporter is higher for less credit constraint firms. On the other hand, they fractured regarding the impact of credit constraints on intensive margin of export. While Manova predicts that credit constraints will lower the volume of exports, Chaney predicts that credit constraints will not affect the intensive margin of export. Different assumptions about the financing of variable production costs constitute the basis of disagreement. According to Manova setting, firms need to attain outside financing for variable costs associated with the exports whereas according to Chaney setting outside financing required only for paying fixed export market entry costs and once the firm becomes exporter, the export volume only depends on the productivity level. Empirical investigations, on the other hand, generally find evidence about the impact of credit constraints on both extensive and intensive margin of exports. For UK, Greenaway et al. (2007) found no evidence for significant positive impact of better financial health on export propensity instead it is found that exporting improves the financial health. For Belgium, Muuls (2008), for Italy Minetti and Zhu (2011) and for India Kapoor et al. (2012) concluded that credit constraints affect both extensive and intensive margin of export.

Although, the impact of financial imperfection on export has been attracted considerable attention, export behaviour under crisis which is one of the main sources of the financial imperfection has not been studied yet[28]. The aim of this chapter is to fill this gap by investigating Turkish manufacturing firms export behaviour under crisis more precisely, investigating the impact of different crises on intensive and extensive margin of export and to contribute to a set of literatures.

Turkish economy has been hit by several times by different type of crises in the last twenty years and consequently, Turkish economy, undoubtedly, provides a good case for studying the crisis. Especially investigation of the export behaviour of the firms during the crisis is crucial since exports usually considered as a way for riding out the crisis in Turkey. Hence, understanding firms' responses in the wake of crisis is important for reducing the costs of the crisis for Turkish economy. Moreover, investigation of this issue by using the advantage of Turkish economy and this dataset will provide several important contributions to different literatures.

The first stage is to identify and classify different crisis that the Turkish economy exposed for the 1990-2010 periods. To do so, among alternatives the easy and tractable one proposed by Kibritçioğlu (2002) is employed. Then in order to gain insight about the identified crises and to understand macro-economic conditions that firms were exposed to, some of the basic macroeconomic developments during 1990s and the first decade of 2000s will be given briefly. Descriptive evaluation of change in extensive and intensive margins over time will provide insight. However, descriptive analysis is not adequate in identification the determinants of the changing exporting behaviour under crisis. The next step is to use econometric analysis in order to fully display the impact of crises on the export margins. The impact of crises on the extensive margin will be estimated modelling export propensity of pre-crisis non-exporters and pre-crisis exporters

[28] An exception is Amiti and Weinstein (2011) who examined the impact of financial crisis on export behaviour of Japan firms and concluded that health of financial institutions is an important determinant of firm-level exports during crises.

separately. The impact of crises on intensive margin will be investigated by modelling export volume of the firms.

6.1 Defining, Measuring and Identifying Crises in Turkish Economy

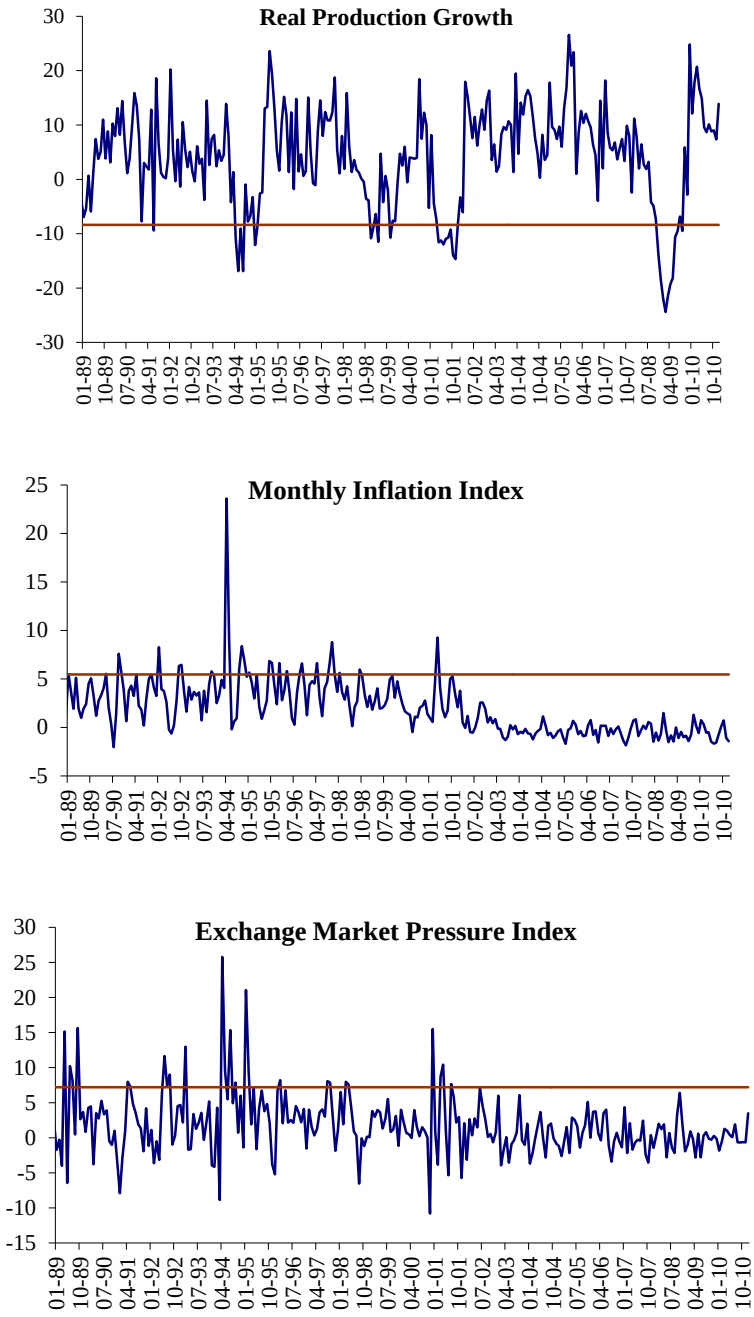
In the literal sense crisis is an unstable condition, as in political, social or economic affairs involving an impending abrupt or decisive changes[29]. Even from this simple definition, it can be understood economic crisis contains sudden, unexpected and significant changes. Hence, the identification of the crisis requires an indicator for monitoring the changes and a threshold for evaluating the significance of the corresponding change. Exceeding the threshold is considered as a signal of a crisis. Different types of economic crisis are defined in the literature. The analysis and identification of the crises in this chapter is based on Kibritçioğlu (2002) definitions and methodology. The underlying reason for preferring his approach is its simplicity and tractability.

Kibritçioğlu (2002) classify economic crises in two broad categories; real sector crisis and financial crisis. Severe contraction in the supply of the goods and services sector and/or severe decline in labor demand can be regarded as causes of the real sector crisis. Real sector crisis is divided into two groups: Goods and services sector crises and labor force market crisis. These two types of real sector crises have subgroups called inflation and stagnation crisis. Inflation crisis is experienced when prices in goods and services sector increase steadily and these price increases are above some threshold. Financial crises, on the other hand, arise when extremely high volatility in exchange rate and stock-market prices is observed or when there are noticeable increases in the bad loans. Financial crises are divided into three main categories as banking sector crisis, currency crisis and stock-market crash. Then, currency crisis is divided into two as balance of payments crisis and exchange rate crisis. Kibritçioğlu proposed

[29] Collins English Dictionary- Complete and Unbridged HarperCollins Publishers 1991, 1994, 1998, 2000, 2003.

to use the standardized industrial production growth, standardized inflation and standardized exchange market pressure indices[30] as the indicators for the different types of crises. Standardized industrial production growth is used for the identification of the real sector crisis. Inflation crisis is identified based on the level of the standardized monthly consumer inflation and exchange market pressure index is used for the identification of the exchange rate crisis. As it was mentioned at the beginning, the common approach in identifying the crisis is the comparison of the indicator with the threshold. Percentiles are used as the threshold values. Accordingly, the economy is said to be in real sector crisis if the annual growth rate of real production is below the corresponding threshold (5th percentile) and in inflation crisis if the standardized monthly consumer inflation exceeds the threshold value (95th percentile) and likewise economy is considered to be experiencing exchange rate crisis if exchange market pressure index is above the threshold value (95th percentile). In Figure 6.1, constructed real production growth, monthly inflation index and exchange market pressure index from 1989 to 2010 are given with the corresponding thresholds that are represented by the red lines in each graphics.

[30] Standardized industrial production growth index is derived from standardization of 12 month changes of industrial production index. Standardized inflation index is derived from standardization of monthly consumer price index changes. Standardized indices are calculated by subtracting sample mean from the index number and then dividing it to the sample standard deviation Exchange market pressure index is simply the average of monthly growth rates of exchange rate and Central Bank's gross foreign exchange reserves. The detailed explanation of the indexes can be found Kibritçioğlu (2002) paper.



Source: TURKSTAT, CBRT and Author's own calculations.
Red lines in the figures represent threshold values for the corresponding series. Threshold values are 5th percentile for the annual real production growth and 95th percentile for the other two series. Those thresholds are used in determining the periods and type of the crises.

Figure 6.1 Real Production Growth, Monthly Inflation and Exchange Market Pressure Indices

Crises are identified by comparing the indicators with the corresponding thresholds. In the following figures for 1989-2010 periods, identified real sector, inflation and exchange rate crises for Turkish economy are given.

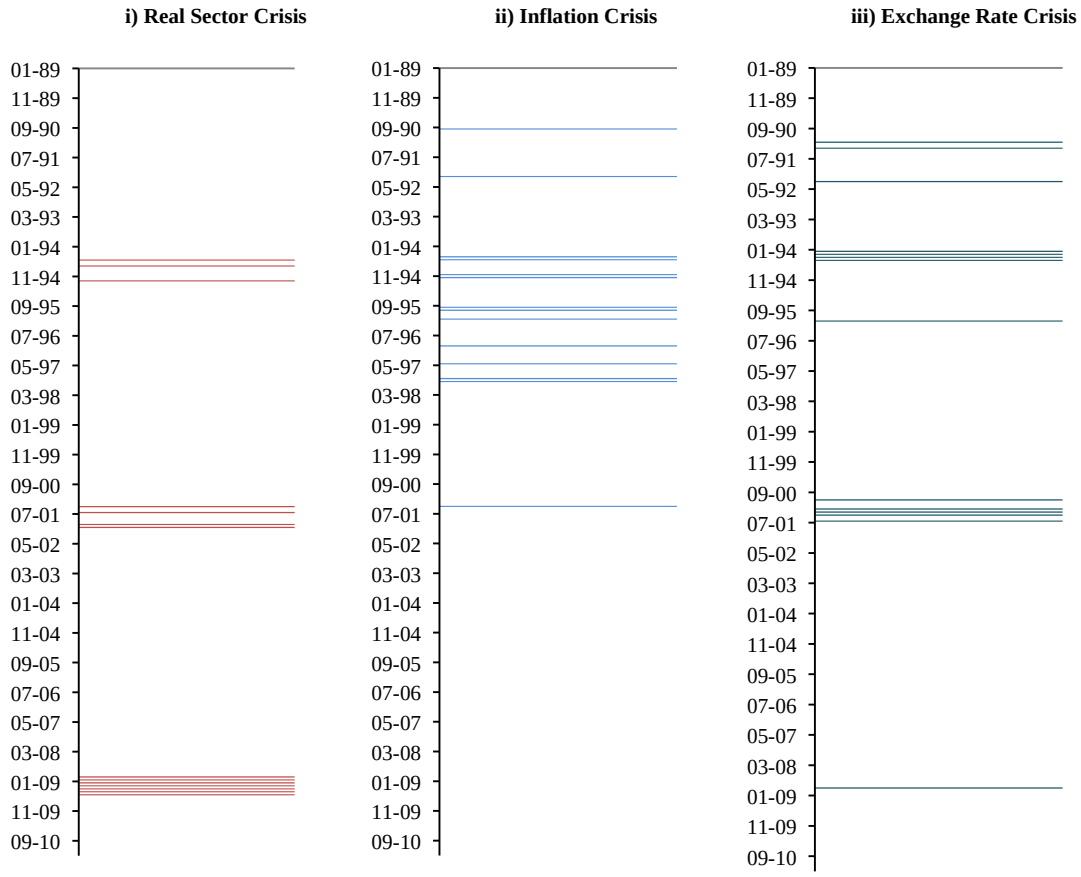


Figure 6.2 Real Sector, Inflation and Exchange Rate Crises in Turkish Economy for 1989-2010 Period

According to the crises indices given above, inflation crises seem to be common feature of 1990s. In recent period, with the liberalization of capital movements, financial crisis risk is becoming increasingly more important. Distinguishing feature of this new threat is that instability

started in the financial sector can easily affect real sector of the economy. Even, it can spread into other countries that have close trade relations. The latest example of this is the 2008 global financial crisis which was started as a financial crisis in USA, affected real sector and then spread out all over the world and its influences still felt.

Exchange rate crises seem to be the by-product of other crises. Each exchange rate crisis seems to be associated with the real sector and inflation crisis that were observed in 1990-1991, 1994, 1996, 2001 and 2008. It is observed that exchange rate crises occurred in 1994 and 2001 had relatively longer effects.

Unlike other crises types, the real sector crises are concentrated on three periods 1994, 2001 and 2008-2009. These correspond to three severe and destructive economic phenomena that experienced in the last thirty years of Turkish economy. Causes and results of these crises will be analyzed shortly in the next section. It is important to note that the aim of the following section is not to discuss the sources or to give comprehensive crisis analysis since this issue has been investigated thoroughly by many researchers. Instead, the purpose is to give quick review and to bring out main characteristics of the crisis mainly based on previously made studies.

6.2 Three Recent Significant Crises of Turkey

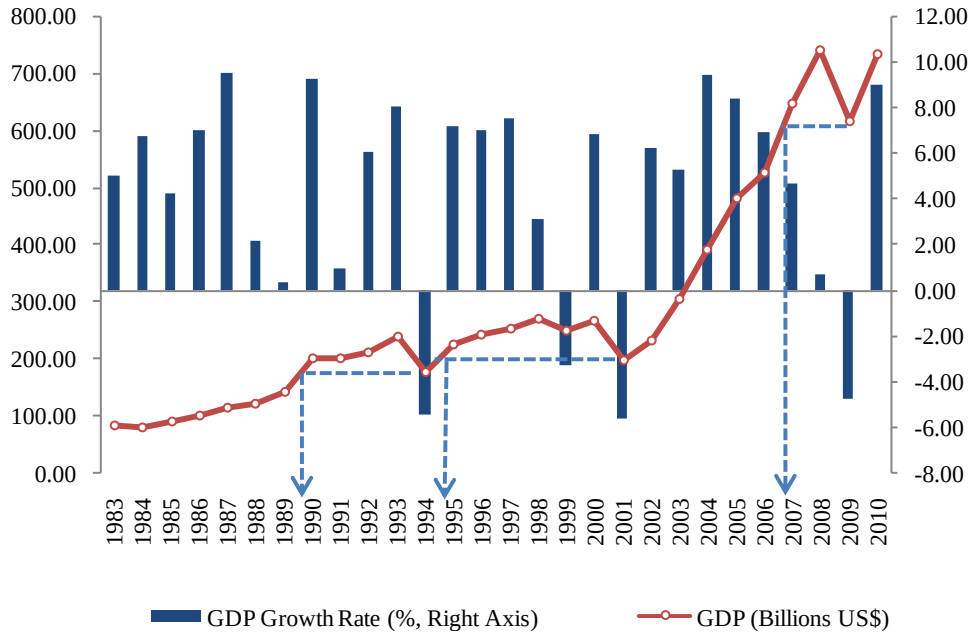
The process of trade liberalization and market-oriented economic reform that had started in many developing countries in early 1980s eventuated in the Turkish economy after the so-called "24 January Decisions" in 1980. Instead of "import substitutive" policies, Turkey relied on free trade regime and has begun to implement "export-led growth model" since the 1980s. When comes to 1990s with more liberalized trade and capital accounts, Turkish economy became more fragile to external shocks and the 1990s are remembered as challenging period. In the remaining part of this section, three severe and destructive economic crisis of Turkish economy will be reviewed.

6.2.1 1994 Economic Crisis

There are several studies that discuss the causes of 1994 crisis. One of them, Özatay (1996), suggested that 1994 crisis was inevitable when unsustainable level of budget deficit and current account deficit combined with the loss of confidence to the government about its debt payment ability. According to Celasun (1998), burden of public sector borrowing, extravagant agricultural subsidies, suffering of state owned enterprises, increased military expenditures and interest payments were among the sources of 1994 crisis. On the other hand, Üçer et al. (1998) blamed systematic worsening of the macroeconomic variables for the occurrence of 1994 crisis. Despite differences in approaches, the characterization of the crisis was similar.

The common view about the first triggering episode of the 1994 crisis was the government attempt to mitigate public debt burden with the Central Banks cash advances after cancelling auctions of short-term maturity Treasury bills in the last month of 1993. Moreover, when the government's 1994 budget did not contain any fiscal measures for tightening triggered the anxiety in the financial markets and with the downgrading of Turkey's credit rate in January 1994 fostered the increasing anxiety in the financial sector. As the government's ability to borrow from domestic market decreased, the government began to relay more on cash advances from the Central Banks and buildup of liquidity affected exchange rate and the margin between the official and market exchange rates began to increase (Durgut, 2002). Depreciation of the Turkish Lira directed commercial banks and depositors to foreign exchange. In order to close their foreign exchange positions, commercial banks rushed to the foreign exchange market and the depositors rushed to withdraw their foreign exchange deposits simultaneously. Meanwhile, Central Bank's attempt to defend the exchange rate caused lost half of its international reserves and sharp increase in the overnight interest rates; from 70 percent on January to 700 percent on March 11. After that occurrence of economic crisis was inevitable and Turkish economy took a major blow with the 1994 crisis. The main features of the 1994 crisis were 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. To sum up shortly; with the occurrence of 1994 crisis, Turkish economy collapsed. The gross domestic production (GDP) level development shows the devastating impact of the crisis more clearly; level of GDP fell to the level of 1989-1990 which implies the cost of this crisis to Turkey is about four years (Figure 6.3).

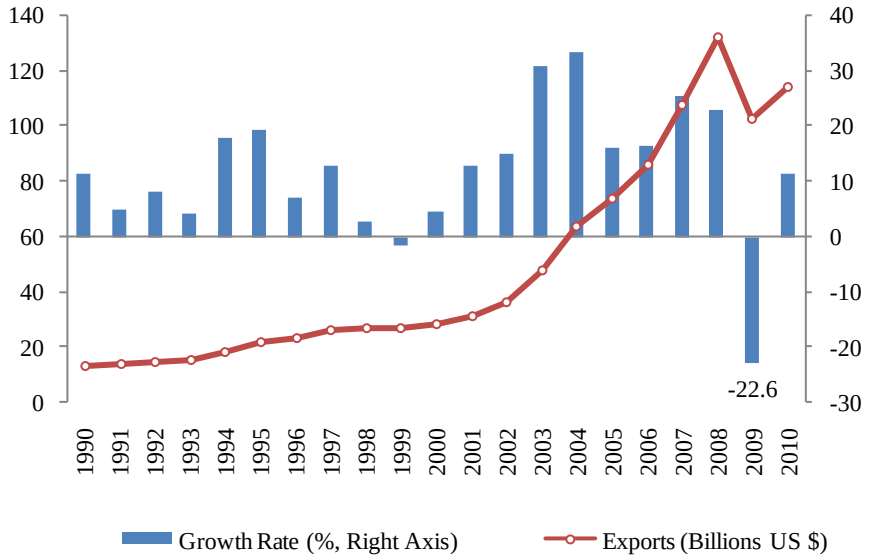


Source: TURKSTAT, Republic of Turkey Ministry of Development Economic and Social Indicators (1950-2010).

Figure 6.3 Annual GDP (Billions US $) and Annual GDP Growth Rate (%), 1990-2010

Despite observed negativity in the overall economy, the performance of exports during 1994 crisis was glamorous. The goods exports increased 18 percent and 19.5 percent respectively in 1994 and 1995 which were considerably above the average growth rates (Figure 6.4). It seems that

sharp contraction of domestic demand and highly devaluated Turkish Lira with 1994 crisis increased the export incentive.



Source: TURKSTAT, CBRT Electronic Data Delivery System

Figure 6.4 Exports (Billions US $) and Annual Growth Rate (%), 1990-2010

Although, contribution of this impressive export performance on the course of recovery can be divisive issue, immediate high growth pace after the crisis leads to the characterization of 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. 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, adverse effect of earthquake was continuing, this time, Turkey encountered with another severe crisis in 2001.

6.2.2 2001 Crisis

In order to overcome the economic instability caused by chronic high inflation and undisciplined financial system in December 1999, Turkey started IMF supported Disinflationary Program with crawling peg exchange rate anchor. 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 increase in domestic demand slowed down the exports; consequently current account deficit widened. 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 considers about the sustainability of 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 as a result of banks attempts to close their foreign exchange rate positions, with the increase of interest rate great volume of capital out flowed and the market risk of Turkey increased. In order to prevent deepening of the crisis, Central Bank preferred to provide extra liquidity to the troubled banks by violating the stabilization program. In conjunction with the IMF announcement about its support to the program by opening a new credit line, government made a new agreement with IMF and Central Bank announced its new monetary program in 22th December. These implemented measures, albeit for a short period, provided to soothe 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. However, the announcement of Prime Minister about the severe political

crisis in 19th February 2001 started crumbling process of fragile banking system.

The political crisis hit the economy in a devastating way and triggered financial crisis. In the same day, stock market declined by 18 percent with this announcement and Central Bank lost approximately its one-third of total official reserves. The next day, two state banks (Ziraat and Halkbank) declared that they were exposed to liquidity squeeze and forced to sell USD 6 billion to Central Bank (Selçuk & Gençay, 2006). The overnight interest rate rose abruptly to 2000 percents on 20th February and 4000 percents on 21st February, exchange rate peg policy was not sustainable anymore and in 22nd February authorities adopted floating exchange rate regime which led to a depreciation of 40 percent against dollar. Although, experiencing 2001 crisis leads to reconstruction of the banking sector and conduces to healthier banking system, it brought out severe and wide-ranging damages. The adverse effect of the financial crisis on banking sector is obvious; 11 banks were taken over by the Saving and Deposit Insurance Fund (SDIF) in the period of November 2000 and February 2001 twin crises (BRSA Turkey, 2010) and total number of brunch offices reduced by 11.7 percent (Yücel & Yıldırım, 15-16 April 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 6.3). This time the cost of crisis was much more, 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[31], 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 6.4). In spite of deep contraction, again strong and decisive recovery period observed during 2002-2007 period. The average annual real GDP growth was 6.8 percent and in two years, pre-crisis GDP level attained (Figure 6.3).

[31] The Radikal, April 29, 2001.

6.2.3 2008-2009 Crisis

After disastrous financial crisis, with the reforms banking sector in Turkey strengthened. Moreover, Turkey's economy enjoyed the macroeconomic stability that obtained by post-crisis tight monetary and fiscal discipline: 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 & Zortuk, 2011). During post-2001 crisis period, 2002-2007, despite Turkish Lira's real appreciation, exports also displayed better-than-expected performance (Figure 6.5).

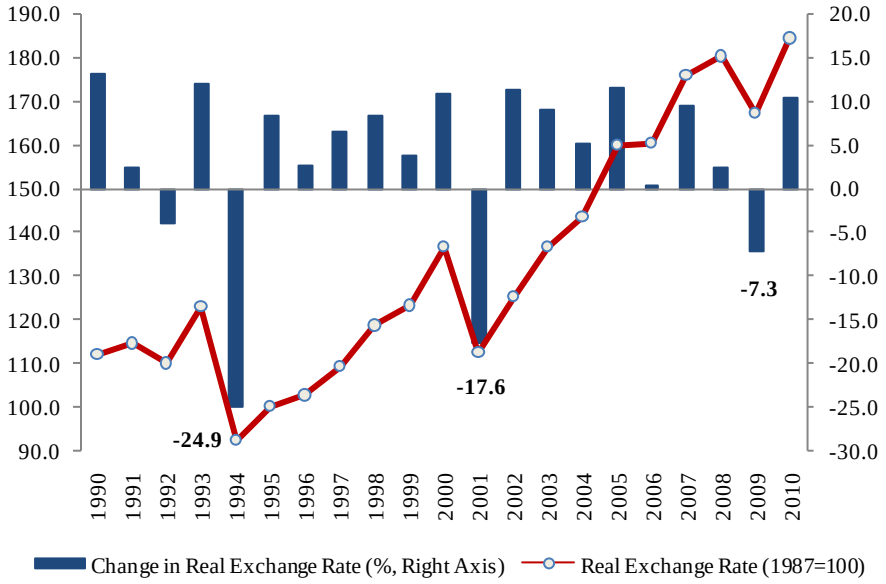


Figure 6.5 Real Exchange Rate (1987=100)

However, increasing economic integration with world in recent period makes Turkey more responsive to global developments. Started as housing bubble in U.S., the financial crisis gripped the world in short period of time.

Kibritçioğlu (2010, p.7) mentions four potential spread channels of the crisis that emerged in a large economy to other economies:

1. Over-risky asset trade channel: Existence of financial actors that are engaged in over-risky asset (named as “toxic” assets) trade with the country in crisis increases the contamination risk of the crisis.
2. Credit channel: Contraction in global liquidity can make difficult to reach external financing for domestic banks and companies. This in turn can lead to liquidity constraints and consequently crisis.
3. Trade channel: Stagnation in countries (that led to crisis and that affected from the crisis) can reduce the demand for the third countries export to the extent of the trade relation.
4. Confidence channel: Increasing uncertainty and/or implemented economic policies of the third country can lead to the reduction in the confidence of consumers and investors. Confidence loss can trigger the impact of the previously mentioned channels.

Thanks to the lack of derivative assets trade, the impact of the over-risky asset trade channel was scarce for the case of Turkey. However, severe demand contraction in Turkey’s the most important trade partner, Europe, affected primarily exporting sector and then via expectation channel flowed through other sectors. In addition to trade channel, Turkish economy has taken its share from the global financial crisis through credit channel also. Contraction in global liquidity and increasing uncertainty in the international markets enforced banks to maintain a liquid position.

Despite having many different crises, the recent global crisis was extraordinary for Turkish economy. High inflation rate, high public debt or unsustainable current account deficits; up until now, Turkey experienced endogenously origin crisis. However, the recent crisis arose mainly due to the external factors. Primarily the adverse effects of this crisis were not recognized and may be because of this, government was late to take precautions against the crisis. However, the impact of this extraordinary crisis started to reveal in 2008 by the slow down and stared in 2009 by the contraction of the economy by 4.8 percent. The real exchange rate

continued to be appreciated in 2008; the real depreciation rate remained fairly limited (7.3 percent) compared to 1994 and 2001 crises (Figure 6.5). However, unlike previously experienced crises, exports influenced severely by the crisis through trade channel as mentioned above. In 2009, goods exports declined 22.6 percent annually.

These three recent crises display important differences according to their dynamics and consequences. The main difference between 1994-2001 crises and 2008 crisis is that while 1994 and 2001 crises originated from internal dynamics, 2008 crisis stemmed mainly from global developments. When these crises are evaluated from exporters' perspective, our intuitions are as follows: The gold medal goes to 1994 crisis. The main characteristics of 1994 crisis, shrinking domestic demand and devalued currency, can be regarded as the promoting factors for export activity. Then, silver medal goes to 2001 crisis. Like 1994 crisis, 2001 crisis can be characterized by shrinking domestic demand and devalued currency but in addition to these, existence of severe credit crunch created challenges. Lastly, the bronze medal goes to 2008 crisis. As mentioned before, dynamics of the 2008 crisis is completely different from the previous two crises. Domestic demand contraction and devaluation of the currency is relatively moderate. Already, Turkish exporters have learned how to progress with valued currency. On the other hand, sharp decline in foreign demand and shrinking international liquidity, caused obstacles for the export activity.

The remaining of this chapter is devoted to the investigation of the impacts of different crises on the firms' exporting behaviour. Investigation starts with descriptive analysis of the crisis on extensive and intensive margins of exports. Although descriptive analysis can provide valuable insights, it is not adequate for identifying determinants and their significance. Behavioral changes caused by crisis will be identified econometrically in the last section.

6.3 Descriptive Analysis

The first signs of behaviral changes caused by the crisis can be obtained from transition rates. Transition rates show the transition of firms across markets and are evaluated by considering export status for two consecutive years. In Table 6.1, summary for the possible transitions across markets and corresponding category names are given.

Table 6.1Transition Across Markets

		Firm Export Status at time t+1	
		Non-exporter	Exporter
Firm Export Status at time t	Non-exporter	Continuous Non-exporter	Export Starter
	Exporter	Quitter	Continuous Exporter

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 as continuous exporters. When a non-exporting firm starts to export in the following year is categorized as export starter and when an exporting firm cease to export in the next year is called quitter. Following transitions rates over time is expected to give signal for the possible effects of crises on the firms' exporting behavior.

Table 6.2 Transition Rate across Markets

Year t status	Non-exporter		Exporter	
Year t+1 status	Non-exporter	Exporter	Non-exporter	Exporter
Export Status	Continuous Non Exporter	Export Starter	Export Quitter	Continuous Exporter
Pre 1994 Crisis (1990-1993)	82.7%	17.3%	17.9%	82.1%
1994	67.5%	32.5%	7.2%	92.8%
Post 1994 / Pre 2001 Crisis (1995-2000)	80.9%	19.1%	7.5%	92.5%
2001	78.4%	21.6%	6.2%	93.8%
Post 2001/ Pre 2008 Crisis (2002-2007)	81.4%	18.6%	5.5%	94.5%
2008-2009	78.7%	21.3%	5.2%	94.8%
Post 2008 Crisis	80.9%	19.1%	5.0%	95.0%
Overall Average (1990-2010)	**80.4%**	**19.6%**	**8.5%**	**91.5%**

Source: Author's own calculations.

Transition rates in Table 6.2 clearly indicate some degree of persistence in the export status, since on average 80.4 percent of the previous year's non exporters continue to be non exporter in the current year and on average 91.5 percent of the previous year's exporting firms continue to export in the current year. However, there are also movements across states; on average 19.6 percent previous year non-exporters start to export and 8.5 percent of the exporting firms cease to export. We also observe that during the crisis period, the strength of persistence lost some pace for non-exporters. 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 which is considerable above the overall average share of export starters (19.6 percent). In 2001 and in 2008/09, the shares of export starters were 21.6 percent and 21.3 percent respectively. Table shows that export quitters share was high during the pre-1994 crisis period. With 1994 crisis, the share of export quitters decline to 7.2 percent from (average) 17.9 percent and continue to decline over time. Table also reveals the fact that although shares vary over time, the persistence of the export status is fairly high. This is considering as an indication for the existence of sunk-cost. 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). Next, in order to investigate transition patterns of different size groups, the same analysis is repeated for different size groups.

Table 6.3 Transition Rates across Markets by Size

	Year t status	Non-exporter		Exporter	
	Year t+1 status	Non-exporter	Exporter	Non-exporter	Exporter
	Export Status	Continuous Non Exporter	Export Starter	Export Quitter	Continuous Exporter
Micro Firms	Pre 1994 Crisis (1990-1993)	91.6%	8.4%	27.5%	72.5%
	1994	86.8%	13.2%	16.9%	83.1%
	Post 1994 / Pre 2001 Crisis (1995-2000)	91.5%	8.5%	18.7%	81.3%
	2001	89.0%	11.0%	21.3%	78.7%
	Post 2001/ Pre 2009 Crisis (2002-2007)	89.9%	10.1%	22.7%	77.3%
	2008-2009	86.6%	13.4%	23.7%	76.3%
	Post 2008 Crisis - 2010	97.1%	2.9%	15.4%	84.6%
	Average	88.8%	11.2%	22.1%	77.9%
Small Firms	Pre 1994 Crisis (1990-1993)	89.0%	11.0%	22.5%	77.5%
	1994	75.3%	24.7%	11.7%	88.3%
	Post 1994 / Pre 2001 Crisis (1995-2000)	83.8%	16.2%	14.0%	86.0%
	2001	81.3%	18.7%	11.8%	88.2%
	Post 2001/ Pre 2009 Crisis (2002-2007)	83.2%	16.8%	9.6%	90.4%
	2008-2009	82.1%	17.9%	8.7%	91.3%
	Post 2008 Crisis - 2010	81.0%	19.0%	10.9%	89.1%
	Average	82.4%	17.6%	12.4%	87.6%
Medium Firms	Pre 1994 Crisis (1990-1993)	79.3%	20.7%	17.3%	82.7%
	1994	53.4%	46.6%	6.4%	93.6%
	Post 1994 / Pre 2001 Crisis (1995-2000)	73.6%	26.4%	6.0%	94.0%
	2001	68.3%	31.7%	4.0%	96.0%
	Post 2001/ Pre 2009 Crisis (2002-2007)	77.2%	22.8%	4.6%	95.4%
	2008-2009	74.0%	26.0%	4.2%	95.8%
	Post 2008 Crisis - 2010	81.1%	18.9%	4.2%	95.8%
	Average	71.4%	28.6%	6.7%	93.3%
Large Firms	Pre 1994 Crisis (1990-1993)	65.0%	35.0%	14.7%	85.3%
	1994	35.1%	64.9%	1.9%	98.1%
	Post 1994 / Pre 2001 Crisis (1995-2000)	69.3%	30.7%	2.5%	97.5%
	2001	67.9%	32.1%	1.1%	98.9%
	Post 2001/ Pre 2009 Crisis (2002-2007)	71.4%	28.6%	1.7%	98.3%
	2008-2009	68.7%	31.3%	2.3%	97.7%
	Post 2008 Crisis - 2010	64.9%	35.1%	2.7%	97.3%
	Average	63.7%	36.3%	3.8%	96.2%

Source: Author's own calculations.

When transition rates for different firm types are investigated it is observed that the dynamics of the firms with different characteristics differs. It seems as if there is a positive association between size and the rate of firms entering into the export markets. As firms become larger the share of export starters increases. Moreover, for all size categories, during the crisis the share of export starters displays considerable increases. The relation between size and the rate of quitting export, on the other hand, is negative; micro and small firms have higher export quitter shares. Table reveals some additional interesting trends related with the crisis. While crisis seems to be creating challenges for the survival of the micro firms, for large firms it seems to be creating opportunities for entering into export markets.

In Table 6.4, the transition rates by technological intensity are given. The pattern that emerged across sectors is remarkable. The persistence of non-exporters is fairly weak within sectors. Moreover, it seems as if the degree of persistence decreases with the sophistication of the sector. The highest share of export starters belongs to high-tech firms. For high-tech firms, the highly dynamic structure during the crisis is notable. Again interesting observations are obtained. The export market entry-exit dynamism is higher for the high-tech sector. For 1994 and 2001 crisis, the export starters share increased considerably for the high-tech sector, meanwhile, the export quitter share also displayed sharp increase in 2001 crisis.

Table 6.4 Transition Rates across Markets by Technological Intensity

	Year t status	Non-exporter		Exporter	
	Year t+1 status	Non-exporter	Exporter	Non-exporter	Exporter
	Export Status	Continuous Non Exporter	Export Starter	Export Quitter	Continuous Exporter
Low Technological Intensity Sectors	Pre 1994 Crisis	81.7%	18.3%	15.3%	84.7%
	1994	66.7%	33.3%	5.6%	94.4%
	Post 1994 / Pre 2001 Crisis	82.5%	17.5%	7.0%	93.0%
	2001	80.8%	19.2%	6.2%	93.8%
	Post 2001/ Pre 2009 Crisis	83.7%	16.3%	6.3%	93.7%
	2008-2009	80.6%	19.4%	6.2%	93.8%
	Post 2008 Crisis 2010	82.0%	18.0%	6.8%	93.2%
	Average	78.9%	21.1%	7.7%	92.3%
Medium-Low Technological Intensity Sectors	Pre 1994 Crisis	86.0%	14.0%	23.6%	76.4%
	1994	74.2%	25.8%	8.2%	91.8%
	Post 1994 / Pre 2001 Crisis	81.2%	18.8%	8.0%	92.0%
	2001	78.3%	21.7%	6.6%	93.4%
	Post 2001/ Pre 2009 Crisis	82.0%	18.0%	5.3%	94.7%
	2008-2009	78.3%	21.7%	4.9%	95.1%
	Post 2008 Crisis 2010	81.0%	19.0%	4.2%	95.8%
	Average	80.4%	19.6%	9.5%	90.5%
Medium-High Technological Intensity Sectors	Pre 1994 Crisis	81.6%	18.4%	21.7%	78.3%
	1994	63.1%	36.9%	11.4%	88.6%
	Post 1994 / Pre 2001 Crisis	77.1%	22.9%	8.4%	91.6%
	2001	73.5%	26.5%	5.0%	95.0%
	Post 2001/ Pre 2009 Crisis	73.2%	26.8%	4.3%	95.7%
	2008-2009	73.1%	26.9%	4.0%	96.0%
	Post 2008 Crisis 2010	77.5%	22.5%	2.9%	97.1%
	Average	73.6%	26.4%	8.4%	91.6%
High Technological Intensity Sectors	Pre 1994 Crisis	77.9%	22.1%	18.8%	81.2%
	1994	48.0%	52.0%	7.5%	92.5%
	Post 1994 / Pre 2001 Crisis	66.7%	33.3%	7.6%	92.4%
	2001	50.0%	50.0%	18.0%	82.0%
	Post 2001/ Pre 2009 Crisis	64.8%	35.2%	3.7%	96.3%
	2008-2009	63.3%	36.7%	3.1%	96.9%
	Post 2008 Crisis 2010	100.0%	0.0%	3.1%	96.9%
	Average	62.3%	37.7%	10.3%	89.7%

Source: Author's own calculations.

Summing up, the firm dynamics seems to have changed over time and for different firm characteristics. Larger and more technological intense firms have higher rate for export market entrance. Smaller firms' entrance

and survival in export markets is lower compared to the larger firms. Tables also reveal that entry-exit dynamics of the firms have been changing with the crises. While 1994 crisis increases the rate of firms entering the export market considerably, 2008 crisis impact is relatively restricted. This is expected since 2008 is a global crisis which caused noteworthy contraction in export markets.

Above the transition of the firms across markets is investigated. Now, the change in the set of exporter (extensive margin) will be investigated. Figure 6.6 displays the distribution of the firms over time according to the exporter type.

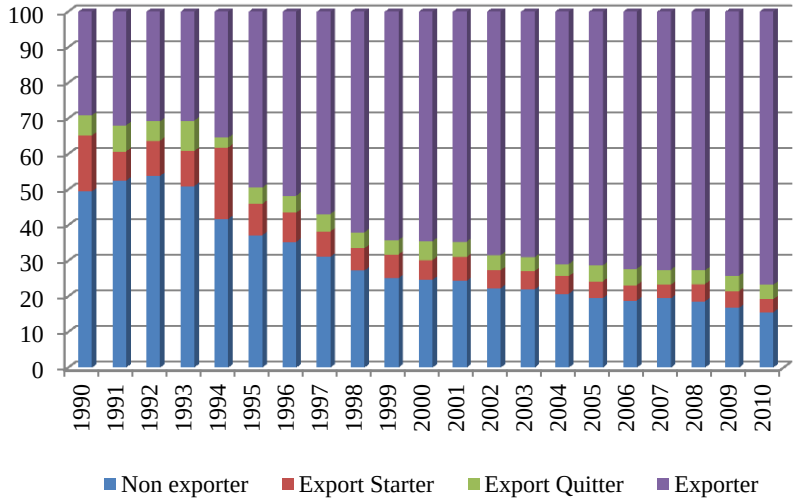


Figure 6.6 Distribution of The Firms According to the Exporter Type

The rate of exporter increases over time. However, the effect of 1994 crisis on this increase can not be disregarded. With 1994 crisis export starters increased and then level shifts occurred in the share of exporters. In 2001 crisis, the share of export starters increased at lower level. In 2008 crisis, the share of export starters declined at a small amount. However for each of the three crises, the set of exporters (exporters and export starters) increased. Therefore, 32 percent exports contraction observed in 2009 (Figure 6.4) cannot be attributed to extensive margin (number of exporters).

In Figure 6.7, the percentage of nominal net sales that is exported are given for export starters and continuous exporters.

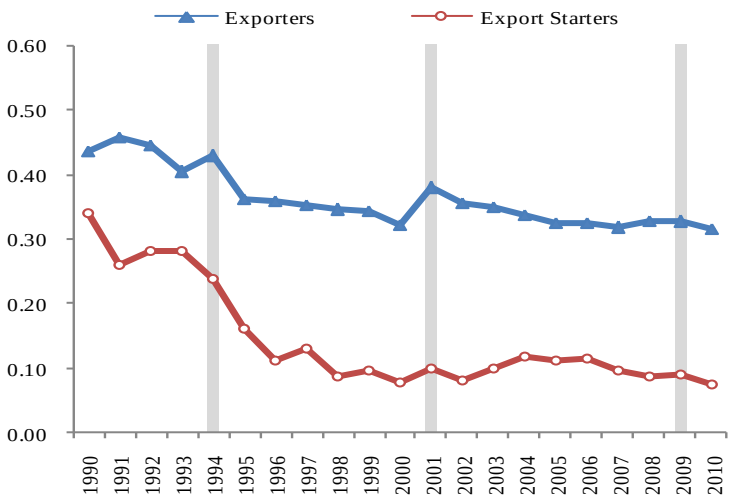


Figure 6.7 Foreign Sale Intensity of Continuous Exporters and Export Starters

The figure shows that during 1994 and 2001 crisis, not only the set of exporters (extensive margin) increases but also the existing exporters increase their exports volume (intensive margin). Hence, during 1994 and 2001 crises, both extensive and intensive margin of exports contributed to the observed considerable increase in exports. On the other hand, for the case of 2008-2009 crisis, while extensive margin of export increased intensive margin of export declined and increase in extensive margin was offset by the fall in intensive margin so that as a result exports contracted.

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 the effect of the crisis on export behavior will be analyzed in details.

6.4 Econometric Approach

Evaluation of the crises in Chapter 6.2 led to the formation of intuitive concept: Different crisis has different impacts on export dynamics. Estimation results obtained in the previous chapter together with the descriptive analysis in the previous section provide concrete evidences about this concept. In this section, using econometrics, the impact of the crises on export dynamics will be investigated in details.

After the Melitz model, 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 due to the fact that in the setting developed by Melitz, there is both an intensive and extensive margin of adjustment of trade flows to trade barriers. As it is observed while the existence of sunk-costs investigated, crises led to changes in the sunk-costs which are considered as a type of trade barrier. 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.

6.4.1 Impact of Crises on Extensive Margin of Export

In this section, the impact of crises on the extensive margin of export will be investigated by modeling the export propensity of the firms during the crises. However, it is well-documented fact that the export behavior of export starters and incumbent exporters differ (Bernard & Jensen, 1999b; Wagner, 2010). Therefore, in order to account for this difference, the export propensity of the firms is investigated by considering the probability of exporting both for pre-crisis exporters and non-exporters explicitly. Another reason for this approach is that in the previous chapter, it is verified that previous export market experience has significant effect on the propensity to become exporter which was attributed to the existence of sunk-costs.

Moreover, it has been shown that the importance of sunk-costs changed with the crises. However, it is assumed that the entry costs are paid once and for all by the firms that did not export in the previous period. Therefore, the impact of the crisis on the propensity to become exporter has to be investigated separately for the firms that were exporters and non-exporters in the previous period. The need for separate investigation is also confirmed by the descriptive analysis conducted in the previous section; it has been shown that transition rates across markets changed during the crises. The share of export starters changed considerably (and the share of non exporters declined) and the share of exporting firms increased slightly (and the share of export quitters declined) during the crises. Hence, it is observed that during the crisis the set of exporters (extensive margin) changed via export starters and continuous exporters but their contribution differ.

Therefore, in order to identify the impact of crises on extensive margins of trade more concretely, probability of pre-crisis non-exporters to start exporting during the crisis (Model 1) and probability of pre-crisis exporters to continue exporting during crises (Model 2) is modelled separately for three different time spans that cover 1994, 2001 and 2008-2009 crises. More precisely, the first time span covers 1993-1995 period, the second time span is from 2000 to 2002 and the third is from 2007 to 2010. Hence different from other applications[32], instead of using full set of firms, the export propensity of the firms is investigated for export starters and continuous exporters separately. Hence 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 export 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.

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

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 exported last two year before the estimation span. More precisely, the firms that exported in 1991 and 1992 constitute the estimation sample for 1994 Crisis of Model 2, firms that exported in 1998 and 1999 constitute the estimation sample for 2001 Crisis of Model 2 and firms that exported in 2005 and 2006 constitute the estimation sample for 2009 Crisis of Model 2.

The empirical trade literature using firm level data investigated 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 costs of export. A firm decides to become exporter, $Y_{it} = 1$, if current and expected revenues exceeds the costs,

$$Y_{it} = \begin{cases} 1 & if \ \ \hat{R}_{it} > f_{it}^{VC} + f^{C}(1 - Y_{it-1}) \\ 0 & otherwise \end{cases} \quad \textbf{(28)}$$

Here, f_{it}^{VC} denotes the variable production cost and f^{C} denotes the fixed export costs (sunk-costs). $f^{C}(1 - Y_{it})$ implies that the firm has to pay sunk-cost if it did not export in the previous period, $Y_{it-1} = 0$. $\hat{R}_{it}$ is the sum of current export revenue and discounted expected values of future income depending on the firms export decision today,

$$\hat{R}_{it} = r_{it} + \delta(E_t[V_{it+1}(.)|Y_{it} = 1] - E_t[V_{it+1}(.)|Y_{it} = 0]) \quad \textbf{(29)}$$

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

$$Y_{it} = \begin{cases} 1 & if \ \ \beta X_{it} + \gamma Z_t - f^{C}(1 - Y_{it-1}) + \varepsilon_{it} > 0 \\ 0 & otherwise \end{cases} \quad \textbf{(30)}$$

Usually (30 is used for testing the existence of sunk-costs and estimated as dynamic discrete choice model as we have done in the previous chapter. However, due to the reasons that were mentioned above, 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:

$$Y_{it} = \begin{cases} 1 & if \;\; \beta X_{it} + \gamma Z_t + \varepsilon_{it} > 0 \\ 0 & otherwise \end{cases} \quad \textbf{(31)}$$

With discrete choice model, it is assumed that actual export behavior can be adequately described by a latent variable model which 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 firms efficiency, quality and financial health, unobservable firm characteristics $\alpha_i$that determine net export benefits and macroeconomic variables Z_t.

$$\mathrm{Y_{it}^{*}} = \alpha_i + \beta \mathrm{X_{it}} + \gamma \mathrm{Z_t} + \varepsilon_{it} \quad \textbf{(32)}$$

If the latent variable, $\mathrm{Y_{it}^{*}}$, 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

$$Y_{it} = \begin{cases} 1, & Y_{it}^{*} > 0 \\ 0, & Y_{it}^{*} \leq 0 \end{cases} \quad \textbf{(33)}$$

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

$$\Pr(Y_{it} = 1|\mathrm{X_{it}}, \alpha_i) = \Pr(Y_{it}^{*} > 0|X_{it}, \alpha_i) = \Phi(X_{it}\beta + \alpha_i) \quad \textbf{(34)}$$

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:

$$Y_{it}^{*} = \beta X_{it} + \alpha_i + \varepsilon_{it} \quad \text{with } \varepsilon_{it} \sim \text{Logistic}$$
$$Y_{it} = \begin{cases} 1, & Y_{it}^{*} > 0 \\ 0, & Y_{it}^{*} \leq 0 \end{cases} \qquad \textbf{(35)}$$

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 due to the fact that 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 heteroskedasticity 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 effects or random. 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 random effects model, it is assumed that unobserved firm heterogeneity is uncorrelated with each explanatory variable and the following specification is used.

$$Y_{it} = \alpha_i + \beta X_{it-1} + \gamma Z_t + \varepsilon_{it} \qquad \textbf{(36)}$$

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 containing efficiency measures (productivity and profitability), quality measures (technology usage, marketing expenses and capital intensity) and financial health measures (liquidity and credit constraints). The lagged values for all of the firm specific covariates are used in order to avoid simultaneity problem that is common to panel data models. In order to capture macroeconomic changes, the vector of Z containing real exchange rate, domestic and foreign demand is used. The unobserved firm specific effect that is assumed to be

uncorrelated with the other explanatory variables is denoted by α_i and ε_{it} stands for the regression error.

In Table 6.5, the random effects logit model estimation results for three crisis periods, 1993-1995, 2000-2002 and 2007-2010 are given.

Table 6.5 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 Crisis (2007-2009)	
		Model 1 (1)	Model 2 (2)	Model 1 (3)	Model 2 (4)	Model 1 (5)	Model 2 (6)
Size	Micro	-2.51***	-2.15***	-1.78***	-3.19***	-1.00*	-2.06***
		(0.32)	*(0.48)*	*(0.48)*	*(0.54)*	*(0.44)*	*(0.43)*
	Small	-1.49***	-0.64**	-0.87**	-1.41***	-0.13	-1.05***
		(0.17)	*(0.21)*	*(0.28)*	*(0.28)*	*(0.26)*	*(0.24)*
	Large	0.96**	0.60*	0.77	0.97**	1.13*	1.08***
		(0.30)	*(0.24)*	*(0.49)*	*(0.38)*	*(0.47)*	*(0.31)*
Technological Intensity	Low	0.23	0.80**	-0.43	-0.77	0.14	-1.00**
		(0.21)	*(0.26)*	*(0.33)*	*(0.56)*	*(0.34)*	*(0.31)*
	Medium-high	0.88***	0.34	0.05	-0.39	1.33**	-0.06
		(0.25)	*(0.31)*	*(0.40)*	*(0.41)*	*(0.45)*	*(0.36)*
	High	2.22***	0.29	-1.26	-1.42*	4.24*	0.24
		(0.62)	*(0.65)*	*(1.58)*	*(0.61)*	*(1.91)*	*(0.93)*
Firm Specific Variables	Productivity	0.17*	0.22*	-0.05	0.23	0.04	0.15
		(0.08)	*(0.11)*	*(0.15)*	*(0.14)*	*(0.13)*	*(0.12)*
	Credit constraint	1.50***	0.08	1.75**	1.79**	0.99	0.99*
		(0.36)	*(0.44)*	*(0.62)*	*(0.56)*	*(0.55)*	*(0.48)*
	Capital Intensity	0.08	-0.04	0.13	0.12	0.00	-0.02
		(0.07)	*(0.08)*	*(0.11)*	*(0.10)*	*(0.08)*	*(0.08)*
	Profitability	-0.08	6.09*	2.77	8.87**	-5.50**	4.26**
		(1.67)	*(3.05)*	*(2.67)*	*(3.02)*	*(2.13)*	*(1.53)*
	Liquidity	-0.02	0.38	-0.56	1.07	0.13	-1.13
		(0.41)	*(0.57)*	*(0.68)*	*(0.73)*	*(0.63)*	*(0.60)*
	R&D Expenses	1.97	1.45	-0.80	3.93	0.51	0.35
		(1.12)	*(1.87)*	*(2.07)*	*(2.55)*	*(1.92)*	*(1.35)*
	Marketing Expenses	0.89*	0.91*	-1.11	2.23***	-0.75	3.72***
		(0.35)	*(0.45)*	*(0.66)*	*(0.66)*	*(0.65)*	*(0.64)*
Macroeconomic Variables	Real Exchange Rate	-0.07***	0.01	0.02	0.05	-0.05***	0.02
		(0.02)	*(0.04)*	*(0.03)*	*(0.03)*	*(0.01)*	*(0.01)*
	World Demand	0.06***	0.06*	-0.12***	-0.02	-0.03***	0.03***
		(0.02)	*(0.03)*	*(0.03)*	*(0.03)*	*(0.00)*	*(0.00)*
	Domestic Demand	-0.02	-0.19	0.06	-0.15**	0.13***	-0.06*
		(0.07)	*(0.12)*	*(0.05)*	*(0.06)*	*(0.03)*	*(0.02)*
Number of Observations		5314	3172	1923	5727	1839	8124
Number of Firms		1968	1152	727	2039	646	2583
Log Likelihood		-2349.9	-911.0	-819.6	-889.6	-735.8	-1207.6
Rho		0.71	0.46	0.68	0.71	0.64	0.74
Wald Chi Square		572.7	340.2	198.8	201.3	197.8	423.8
p-value		0.00	0.00	0.00	0.00	0.00	0.00

Source: Author's own calculations.
Robust standard errors are given in the parentheses. *, ** and *** indicates significance at 10, 5 and 1 percent levels respectively. Model 1 is used for modelling the likelihood of pre-crisis non-exporters to start exporting during the crisis. Model 2 is used for modelling the likelihood of pre-crisis exporters to continue exporting during the crisis. All firm specific variables are used as lagged variables in order to avoid simultaneity problem.

Starting with the model assessment, the corresponding statistics are given at the bottom part of the table. In maximum likelihood models common method to examine the goodness of fit is to assess the difference between the residuals of the model under consideration and the residuals of the constant only model. The Wald Chi Square test statistics serves for this and for all estimated models, the corresponding summary measures indicate that the model fits are acceptable. The summary measure, Rho shows the correlation between firms' propensities to export in different years after controlling for firm specific factors.Rho, the intra correlation in the model which is fairly large indicating high correlation between firm's propensities to export in different years. This can be regarded as a justification for the use of random effects model.

The first two columns show the estimation results for the 1994 crisis that covers 1993-1995 periods. The first column summarizes the determinants of probability of pre-crisis non-exporters to start exporting during 1994 crisis period, whereas the second column displays the determinants of the probability of pre-crisis exporters to continue exporting during the same period. The comparison of the statistical significance of the estimated coefficients for pre-crisis exporters and non-exporters reveals that the probability of becoming exporter for medium-high and high-tech firms is higher whereas survival probability for low-tech firms is higher during 1994 crisis. Moreover, it is observed that accessibility to external finance was pre-requisite for the entrance into export markets but not important for the survival during 1994 crisis period. It is found that the probability to become exporter is higher for larger, more productive, less credit constrained, more profitable and more quality oriented firms. On the other hand, size, profitability and expenditures on quality are found to be major determinants of the pre-crisis exporters' decision on continuing export activity during the 1994 crisis period. Accordingly, larger, more productive, more profitable and high-quality producing manufacturing firms have higher probability to survive in the export markets during 1994 crisis.

Previously conducted analysis showed that self-selection of the better firms into export markets is one of the main features of the Turkish

manufacturing firm. Estimation results given in the first column imply that self-selection behavior has not been violated during the 1994 crisis. Efficiency measures (size and productivity) and liquidity constraint still play important role on the exportation probability of the pre-crisis non-exporters which provide evidence for the self-selection of the firms into export markets. Another previously obtained result is related with the shrinking export premium during 1994 crisis. The consequences of 1994 crisis, increase in inflation, interest rates and devaluation all increased the costs of production in addition to increasing costs, demand contraction created challenging conditions for the firms that serve to domestic markets. Shrinking of the export premium despite of self-selection of better firms into export markets implies the bankruptcy of the least productive non-exporters so that the averages of exporters and non-exporters converge to each other.

When macroeconomic variables are considered, real exchange rate is found to be statistically significant determinant for the export decision of the pre-crisis non-exporters but not for the export decision of the pre-crisis exporters. This implies that although large devaluations allured the firms and induced the entry into export markets, it did not have any significant impact on the existing exporters' decisions. On the other hand, expanding foreign markets increased both the pre-crisis non-exporters' entry probability and pre-crisis exporters' survival probability.

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. Micro and small sized firms' probability to become exporter is significantly less than the probability of the medium sized firms. However, the estimated coefficient for large dummy variable is not statistically different than zero which implies to be large did not change the exportation probability. Moreover, productivity is not found to be statistically important. This two imply that the general view about the self-selectivity of large and 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 constraints are the only statistically significant firm-specific factors that affect the propensity to become exporter. 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. Neither the size nor the productivity level seems to matter; only those firms that can find external finance for trade costs were able to enter into export markets. On the other hand, the probability of continuing to export during the 2001 crisis period is found to be depends on the size, credit constraints, profitability and quality production 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 (2009), due to the higher default risk and higher working capital requirements of the export, exporters are more sensitive to financial turmoil. Credit crunch led some pre-crisis exporters with poor performance to become exposed to credit rationing. Consequently, those firms that could not find external finance for covering the cost of continuing to export were forced to exit the export markets. Moreover, estimation results reveal that particularly high-tech firms were exposed to credit rationing. The only significant coefficient estimates for the sector dummies belongs to high-tech sector and it is estimated to be negative. This explains the pattern observed in Table 6.4 in which the share of quitters for the high-tech sector increased to 18 percent from 7.6 percent during the 2001 crisis. Besides, credit rationing of high-tech firms is an agreed issue in the literature. Hall (2002) discussed extensively sources of the credit rationing of high-tech firms but in summary high-tech firms are more likely to expose to credit rationing due to mainly asymmetric information about creditworthiness. Atzeni and Piga (2003), Fioretti (2005), Minetti and Zhu (2011) and Brown et al. (2012)

empirically showed that high-tech firms faced with credit rationing to a higher extend than others.

In the last two columns (5) and (6) gives the estimation results for the recent global crisis. Consistent with the general pattern, again positive correlation between size and export propensity is observed both for the pre-crisis exporters and non-exporters. When other firm specific variables are considered, the decision to start export during 2008 crisis is found to be influenced mainly by the credit constraints, competitiveness, and profitability of the firms. The interesting result is that the estimated impact of profitability on export propensity of the pre-crisis non-exporters is negative. This behavior can be explained by the shrinking foreign demand and high fixed costs. We have found that during 2008 crisis, sunk-entry costs increased. With increasing entry costs, unfavourable foreign demand and high uncertainty about future exporting conditions seems to discourage profitable firms' entry into export markets and induce "self-selection of less profitable firms into export markets"[33]. When the model estimation results for pre-crisis exporters are considered, it is observed that size, credit constraints, profitability and marketing expenses are found to be positively affecting the probability of continuing to export. Again, like in the case of 1994 crisis, favourable exchange rate movements fostered the export propensity of the pre-crisis non-exporters and have no statistically significant impact on the export decision of the pre-crisis exporters.

Foreign demand is estimated to have negatively significant impact on pre-crisis non-exporters decisions and have positively significant impact on the pre-crisis exporters' decisions during the 2008 crisis periods. The estimated coefficients for foreign demand, indeed, show the impact of market-specific demand shock on export behavior of the firms. If we recall the definition of the foreign demand variable, it is constructed as the export share weighted import volume indices of Turkey's trade partners. Therefore, the foreign demand variable shows mainly the European Union (EU) demand. Therefore, negatively significant coefficient estimate for the case of pre-crisis non-exporters implies that when dominant export market (EU-27)

[33] This expression is taken from Vogel and Wagner (2009, p.12).

expands, less efficient non-exporters can not envisage entering into competition with more efficient incumbent exporters. On the other hand, when the dominant export market (EU-27) shrinks then incumbent exporters will shift to more profitable markets. In this new market, competition of the export starters with the incumbent exporters is more conceivable in this new market- so that negative demand shock from dominant export market induces more firms to start exporting. Accordingly we can conclude that negative demand shocks increases the extensive margin of export.

To summarize the results: First, it is observed that turmoil like 1994 crisis that mainly characterized by high inflation, interest rates and devaluations, does not cause significant differences in the export behavior of the firms. However, it is observed that sunk-costs during 1994 crisis declined which enabled entry of firms with worse performance into export markets. However, still, better firms self-select into export firms and large devaluations create the main motivation for the entry into export markets. Devaluations induce export market entry that is to say increase the extensive margin of export. During the periods of economic turmoil, mainly characterized by contraction of credit supply, like 2001 crisis, highlights the importance of credit constraints. In the case of credit crunch, credit constraints of the firms not only affect the export market participation decision but also affect the continuation decision of the exporters. The self-selection hypothesis becomes invalid in the case of credit crunch; only those firms that can find sufficient external finance for covering the trade costs are able to enter into export markets. Self-selection occurred among the existing exporters: Only better exporters can survive in the export markets during the credit crunch case. In such circumstances, banks are refusing to lend to “unsafe” borrowers and better performance measures of exporters induce banks to be more confident in lending to the firm. However, high-tech firms are found to be exposed to credit rationing during 2001 crisis. During the periods of economic turmoil characterized by credit crunch accompanied by severe foreign demand contraction like in the case of the recent global crisis, in addition to credit constraints, profitability

plays important role on the exportation decision. However, while profitability positively affects the survival probability of the incumbent exporters, it has adverse effect on the probability of starting to export. Unfavourable foreign demand and high uncertainty about future exporting conditions due to the global crisis discourages profitable firms' entry into export markets and induce "self-selection of less productive firms into export markets.

6.4.2 Impact of Crises on Extensive Margin of Export

The impact of different crises on the export volume decision of the firms (intensive margin) will be investigated in this section. While the 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. Now using the advantages of our data set, the determinants of the export values under crises will be studied using Heckman sample selection corrected model. Sample selection correction is used since in the previous chapter it is concluded that better firms self-select into export markets. In export spillover literature the Heckman sample-selection model is commonly used in the analysis of export decisions[34].

The Heckman self-selection model is two equations model. The first equation known as "selection equation" which is considered as a latent dependent variable model that specifies the selection mechanism of the sample units (individuals, firms, countries etc). In our case, selection equation identifies the export market participation decision and defined as follows:

$$z_i^* = \gamma w_i + u_i \quad with\ u_i \sim N(0,1)$$
$$d_i = \begin{cases} 1\ if\ z_i^* > 0 \\ 0\ if\ z_i^* \leq 0 \end{cases} \qquad \textbf{(37)}$$

where z^*denotes unobserved dependent variable (export propensity of the firms in our case) and w stands for the vector of regressors that

[34] 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.

determine the participation decision and u is the error term. The dependent variable z^* is unobservable instead 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:

$$y_i^* = x_i\beta + v_i, \quad v_i \sim N(0, \sigma^2)$$
$$y_i = \begin{cases} y_i^* = x_i\beta + v_i, & if\ d_i = 1 \\ 0, & if\ d_i = 0 \end{cases} \quad \textbf{(38)}$$

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:

$$\begin{pmatrix} u_i \\ v_i \end{pmatrix} \sim N\left[\begin{pmatrix} 0 \\ 0 \end{pmatrix}, \begin{pmatrix} 1 & \rho\sigma \\ \rho\sigma & \sigma^2 \end{pmatrix}\right] \quad \textbf{(39)}$$

where ρ is the correlation coefficient.

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

$$f(y|d = 1, x, w) = \Pr(y \le \tilde{y}|d = 1, w, x) = \Pr(y \le \tilde{y}\ and\ d = 1|x, w)/\Pr(\mathrm{d} = 1|\mathrm{x}, \mathrm{w})$$
$$\Pr(y^* \le \tilde{y}\ and\ z^* > 0|x, w)/\Pr(\mathrm{z}^* > 0|\mathrm{x}, \mathrm{w})$$
$$= \Pr(x_i\beta + v_i \le \tilde{y}\ and\ \gamma w_i + u_i > 0|x, w)/F(\gamma' z)$$
$$= \frac{f((y - \beta' x)/\sigma^2)}{\sigma F(\gamma' z)} \cdot \frac{F(\frac{\rho(y - \beta' x)}{\sigma} + \gamma' z)}{\sqrt{(1 - \rho^2)}} \quad \textbf{(40)}$$

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

$$E(y|d = 1, x, w) = \beta' x + \underbrace{\sigma\rho\frac{f(\gamma' z)}{F(\gamma' z)}}_{\substack{Sample \\ Selection\ Bias}} \quad \textbf{(41)}$$

The two decisions are related if $\rho \neq 0$ and this implies significance of the selection bias. As it can be seen from (41, with significant correlation between these two models 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 (37 is estimated as a probit model using whole sample to determine for each unit in the sample the probability of participation. Then, using the estimated coefficients, the second term in (41 that corresponds to the sample selection bias is estimated as $f(\hat{\gamma}'z)/F(\hat{\gamma}'z)$ and 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 (38 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. In the previous chapter, we have found that lagged export status has a highly significant impact on the export propensity of the firms. In the empirical literature Roberts and Tybout (1997) inferred the existence of sunk-costs from persistence in export status by referring to the theoretical models in trade hysteresis literature. Due to the nature of the sunk-costs, the standard assumption of the heterogeneous firm trade literature is that sunk costs only affect the extensive margin of export (export propensity) and has no impact on the intensive margin (export volume). Therefore, because of these properties, lagged export status is just the right instrument for this setting.

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 model for each year separately. Hence, as proposed by Wooldridge (1995), in two-step estimation procedure, first, export market participation is estimated by probit for each year. Using those estimated probits, the inverse Mills ratios for each firm across years are calculated. Then, the outcome equation with calculated Mills ratios and

interaction of the calculated Mills ratio with year dummies as additional variables is estimated as pooled OLS regression. Specifically, the selection equation for the export market participation decision is as follows:

$$d_{it} = \alpha + \gamma_1 d_{it-1} + \gamma_2 \mathrm{w}_{it-1} + u_{it}, \;\; t = 1990, \ldots, 2010 \qquad \textbf{(42)}$$

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 the efficiency measures (size, productivity, profitability and competitiveness), quality measures (marketing expenses, R&D and capital intensity) and financial measures (credit constraints and liquidity). Technological intense sector dummies are also included.

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

$$\begin{aligned} y_{it} = \delta + \beta x_{it-1} + \gamma_{94} x_{it-1.} D_{94} + \gamma_{01} x_{it-1.} D_{01} + \gamma_{08} x_{it-1.} D_{08} + \delta_{94} D_{94} \\ + \delta_{01} D_{01} + \delta_{08} D_{08} + \mu z_t + \varphi_1 inv_{it} + \varphi_2 T_{1990} inv_{it} \\ + \varphi_3 T_{1991} inv_{it} + \cdots + \varphi_{22} T_{2009} inv_{it} + v_i \end{aligned} \qquad \textbf{(43)}$$

Here, the dependent variable, y_{it}, is the logarithm of the foreign sales and x_{it} denotes the firm specific covariates containing efficiency measures (productivity, profitability and competitiveness), quality measures (marketing expenses, R&D and capital intensity) and financial measures (credit constraints and liquidity. Size and technological intense sector dummies are also included as firm specific covariates. The macroeconomic variables are denoted as z_t and contain real exchange rate, domestic demand and foreign demand. The estimated inverse Mills ratio obtained from the selection equation is denoted by inv_{it} and $T_t inv_{it}$ is the interaction terms of inverse Mills ratio with year dummies.

In order to investigate the impact of the crises on the extensive margin of exports, interaction terms, ($x_{it-1.} D_{94}$, $x_{it-1.} D_{01}$, $x_{it-1.} D_{08}$) and crisis dummies for 1994, 2001 and 2008, (D_{94}, $\mathrm{D}_{01}$and D_{08}) are included by assuming crises caused changes both in intercept and 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 1990-2010 periods. In order to observe how the parameter estimates of the other independent variables are changed by considering the sample selection bias, the models with and without inverse Mills Ratios are estimated and presented in Table 6.6 together.

Table 6.6 Regression Models of Firm Export Volume

		Selection Bias Corrected		Selection Bias NOT Corrected	
		Coefficient	Std. Error	Coefficient.	Std. Error
Size Dummies	Micro	-1.40***	0.09	-2.00***	0.09
	MicroxD94	0.51**	0.23	0.29	0.22
	MicroxD01	-0.26	0.22	-0.39*	0.23
	MicroxD08	-0.28	0.28	-0.18	0.26
	Small	-0.92***	0.04	-1.18***	0.04
	SmallxD94	0.13	0.10	0.00	0.10
	SmallxD01	-0.07	0.08	-0.13	0.08
	SmallxD08	-0.22**	0.09	-0.17*	0.09
	Large	1.56***	0.05	1.74***	0.05
	LargexD94	0.04	0.09	0.19**	0.09
	LargexD01	0.18**	0.08	0.20**	0.08
	LargexD08	0.08	0.08	0.09	0.08
Technological Intensity	Medium-Low	-0.11**	0.05	-0.13**	0.05
	Medium-LowxD94	-0.46***	0.11	-0.68***	0.11
	Medium-LowxD01	-0.03	0.08	0.00	0.09
	Medium-LowxD08	0.29***	0.08	0.40***	0.08
	Medium-High	-0.35***	0.05	-0.28***	0.05
	Medium-HighxD94	-0.65***	0.10	-0.86***	0.11
	Medium-HighxD01	0.13*	0.08	0.17**	0.08
	Medium-HighxD08	0.37***	0.08	0.49***	0.08
	High	-0.37**	0.17	-0.23	0.17
	HighxD94	-0.89***	0.21	-0.90***	0.23
	HighxD01	0.19	0.21	-0.14	0.23
	HighxD08	0.03	0.25	0.33	0.26
Efficiency Measures	Productivity	0.60***	0.02	0.68***	0.02
	ProductivityxD94	-0.30***	0.05	-0.27***	0.05
	ProductivityxD01	0.02	0.04	0.00	0.05
	ProductivityxD08	0.09	0.06	0.04	0.05
	Profitability	0.24	0.58	1.02	0.58
	ProfitabilityxD94	-2.06	1.58	-2.35	1.30
	ProfitabilityxD01	-2.42	1.60	-1.00	1.34
	ProfitabilityxD08	-2.80*	1.24	-2.21	1.54

Table 6.6 (continued)

		Selection Bias Corrected		Selection Bias NOT Corrected	
		Coefficient	Std. Error	Coefficient.	Std. Error
Financial Health	Credit Constraint	1.34***	0.08	1.84***	0.08
	Credit ConstraintxD94	0.26	0.05	0.41*	0.05
	Credit ConstraintxD01	0.81***	0.04	0.96***	0.05
	Credit ConstraintxD08	-1.20***	0.06	-1.50***	0.05
	Liquidity	-0.22	0.14	-0.07	0.11
	LiquidityxD94	0.40	0.28	0.60*	0.29
	LiquidityxD01	-0.23	0.23	-0.17	0.25
	LiquidityxD08	-0.18	0.25	-0.26	0.27
Quality Measures	Capital Intensity	-0.03*	0.08	-0.04*	0.08
	Capital IntensityxD94	0.03	0.20	0.03	0.20
	Capital IntensityxD01	-0.10**	0.03	-0.07*	0.04
	Capital IntensityxD08	0.04	0.03	0.03	0.03
	R&D Exp.	0.66**	0.28	0.92***	0.29
	R&D Exp.xD94	-2.35**	1.12	-2.45**	1.08
	R&D Exp.xD01	-1.13	0.95	-1.19	0.95
	R&D Exp.xD08	-0.87	0.60	-0.92	0.62
	Marketing	0.91***	0.09	1.46***	0.10
	MarketingxD94	-0.54**	0.21	-0.76***	0.22
	MarketingxD01	-0.54***	0.19	-0.59***	0.20
	MarketingxD08	-0.38*	0.20	-0.43**	0.21
Selection Bias	Inverse Mills	-1.97***	-1.97		
	Inverse MillsxD94	0.44*	0.23		
	Inverse MillsxD01	-0.09	0.24		
	Inverse MillsxD08	-1.02***	0.25		
Intercept	Constant	2.35**	1.04	-0.46	1.04
	D94	4.91*	2.82	5.36*	2.31
	D01	5.77**	2.87	3.20	2.40
	D08	4.11*	2.18	3.27	2.73
	Real Exchange Rate	-0.03***	0.00	-0.04***	0.00
	World Demand	0.03***	0.00	0.03***	0.00
	Domestic Demand	0.07***	0.00	0.07***	0.00
	Log-likelihood	-102993.16		-106093.7	
	R2	0.65		0.60	
	Number of Observation	49901		49901	
	Root Mean Square Error	1.91		2.03	
	F-statistics	452.26		491.15	

Source: Author's own calculations.

General model information is given at the bottom part of the table. F-statistics for testing significance of the overall model are highly significant. Also the goodness of fit measure, R^2, is fairly large which shows the satisfactory model fit.

In order to test the presumption made at the beginning, the joint significance of the interaction terms for each variable has been tested and the test results are given at the Appendix B. It has been found that except for the liquidity, the interaction terms are found to be jointly statistically significant. This implies that the importance of each variable on the export

volume changes with the occurrence of the crisis. This is 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 exaggerated 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-selectivity bias, the level of the exports decision is found to be related with the sector, size, productivity, credit constraint, capital-intensity, profitability, liquidity, R&D expenses and non-price competitiveness (marketing expenses) of the firms.

The coefficients on sector dummies imply that there is a negative relationship between the technological sophistication and the export volume. This negative relationship shows the difficulties of Turkish manufacturing firms to compete in sophisticated manufacturing sectors. This is mainly due to specialization of Turkey in low-tech manufactured exports that provides comparative advantage in the trade of low-tech products[35]. When interaction terms of sector dummies with the crisis dummies are considered, we observed that coefficient estimates for Medium-LowxD94, Medium-HighxD94 and HighxD94 are all negatively significant. This implies that in 1994 crisis, export volumes affected adversely for the firms that were not operating in low tech sectors. On the other hand, the coefficients for Medium-LowxD08, Medium-HighxD08 and Medium-HighxD01 are found to be statistically significant and positive. Hence, with the occurrence of 2001 and 2008 crises, medium-low and medium-high tech firms' export volume increased.

The impact of firm size on export intensity has mixed results especially for the developing countries. As it was argued in Wagner (1995)

[35] Topcu and Kılavuz (2012) using several indices showed that Turkey has a comparative advantage in low-tech and medium-low tech sector while it has comparative disadvantage in high-tech products in European Union. Gros and Selçuki (2013) also has same conclusion about the structure of Turkey's comparative advantage.

the economies of scale in production, more fully utilization of executives, opportunity to rise financing at lower costs, benefits from bulk purchasing, own marketing department plus own sales forces are among the reasons to expect positive impact of firms' size on export behavior. However some of the recent studies using developing country data found 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 and LargexD01 is positively significant and SmallxD08 is negatively significant. This implies that occurrence of 1994 crisis positively affected the export volume of the micro firms and the occurrence of 2001 crisis increased the export volume of the large firms. On the other hand, 2008 crisis adversely affected the export volume of small firms.

Productivity and credit constraints of the firms have positive impact on the export volume of the firms. More productive and less credit constraints 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 well documented fact that improvement in non-price competition plays key role in the sustainability of the export market share.

Negative estimated coefficient for capital-intensity is in line with the prediction of the endowment driven conventional trade theory, Heckscher-Ohlin (H-O) trade model. H-O theorem asserts that a country will export the

commodity that requires the intensive use of the country's relatively abundant and cheap factor. This result showed that Turkey does not have a comparative advantage in capital intensive activities. Similar conclusion for Turkey was drawn from the comparative advantage literature. A number of studies investigated the competitiveness of Turkish exports through revealed comparative advantage (RCA) indices. Some of them are Lohrmann (2000), Akgungor, Barbaros and Kumral (2002), Yılmaz (2002), Erlat and Erlat (2005), Yilmaz (2008) and Topcu and Kılavuz (2012). They concluded that Turkey has comparative advantage in resource-intensive and labour-intensive products. Moreover, Kumar and Siddharthan (1994) for India, Srinivasan and Archana (2009) for India, Hiep and Nishijima (2009) for Vietnam and Ma, Tang and Zhang (2011) for China found negative relation between capital-intensity and export activity of the firms. Therefore, our result for Turkey, as a developing country with labor abundance, gives support to the argument that higher capital intensity operation is unlikely to give the firm a comparative advantage in a developing country with labor abundance and relative scarcity of capital. However, highly significant coefficient estimates for R&D expenses and marketing expenses imply the importance of non-price competiveness or in other words quality for the Turkish manufacturing firms.

Our findings, negative impact of capital-intensity and technological sophistication together with the importance of quality, imply specific strategy for improving Turkey's export performance. Contrary to existing general view, instead of shifting from low-tech sector of specialization to high-tech sector, Turkey should keep its specialization in traditional sectors by upgrading the quality of its low-tech and labor intensive products. This specific strategy will help to cope with increasing competition pressure coming from low-cost countries such as China and India and further improve the export performance.

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.

In 1994 crisis, although, same set of firm-specific variables are found to be statistically significant determinant for the export volume their relative importance displays variations. More precisely, according to the estimation results, it is observed that with 1994 crisis the importance of productivity and quality measures declined since we obtain negative and statistically significant coefficient estimates for the interaction terms, ProductivityxD94, R&D Exp.xD94 and MarketingxD94. Justification of this pattern came from previously obtained results. We have shown that during 1994 crisis, sunk-costs declined that allowed entry of firms with poor performance into export markets. Therefore, with the entry of less productive firms into export markets the average impact of productivity on export decision reduced.

In 2001 crisis, it is observed that the importance of credit constraints increased when compared with the general pattern. This is anticipated since 2001 crisis is mainly characterized by severe credit crunch. Moreover, in 2001 crisis the impact of capital intensity increased in absolute terms. As it was mentioned before, negative estimated coefficient for the interaction term on export decision shows the comparatively disadvantageous position of capital intensive firms. With the occurrence of 2001 crisis the comparatively disadvantage of the capital intensive firms increased since we obtain statistically significant negative coefficient for the interaction term Capital IntensityxD01. 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. Similar to 1994 crisis, according to the estimation result, the quality measures lose ground with 2001 crisis.

During 2008 crisis, on the other hand, different pattern is observed. According to the estimation results, the importance of credit constraints and non-price competitiveness declined. Moreover, different from general pattern, profitability is found to be negatively and highly significant determinant factor for the export volume decision of the firms. Negative impact of profitability comes from export starters since in the previous

section it has been found that during 2008 crisis, less profitable firms self-selected into export markets.

Estimation results reveal that crises lead to reduction in the importance of the non-price competition of the firms on export volumes. Increase in price competition with undervaluation of the currency during the crisis periods is possible source for this reduction.

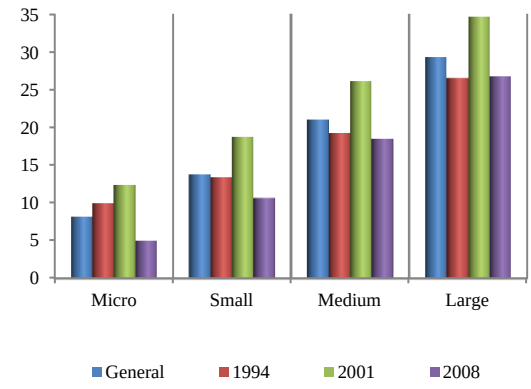
When we turn our attention to macroeconomic variables, the estimated coefficient for real exchange rate is found to be negative implying that exchange rate under valuations favor firms in the export markets. Moreover, expanding domestic markets and foreign markets increases the export sales. Expanding domestic market intensified domestic market competition which encourages firms toward exporting. On the other hand, positive foreign demand coefficient implies that Turkish manufacturing firms are able to enhance their international competition during the expansionary phase of the export markets.

Estimated coefficients for the inverse Mills ratios suggest several important implications. The interaction terms, Inverse MillsxD94, Inverse MillsxD01 and Inverse MillsxD08, display the importance of selection-bias or in other words the impact of unobservable firm-specific factors during the crises. The estimated coefficient Inverse MillsxD94 is found to be positive and statistically significant whereas Inverse MillsxD08 is negatively significant and Inverse MillsxD01 is insignificant. These imply that during 1994 crisis selection bias reduced whereas in 2008 crisis it increased and in 2001 no statistically significant difference occurred. This is important to note that the changes observed in the selection bias are similar to sunk-cost developments. It has been shown that during 1994 crisis sunk-costs declined and in 2008 crisis sunk-costs increased and no statistically significant change occurred in 2001 crisis. This is anticipated since with the reduction of sunk-costs self-selection of the exporters weakened and the correlation between selection and outcome residuals declines. On the other hand, increase in sunk-costs gives weight to self-selection of better firms and it also strengthened the correlation between the selection and outcome residuals.

Quantitative interpretation of the results

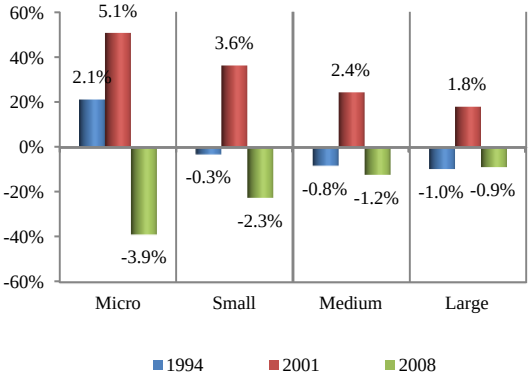
To grasp the overall impact of crises on intensive margin of exports, we calculate the level of exports for different size and sector groups using the estimated model given in Table 6.6[36].

In Figure 6.8, the estimated export volumes for different size groups are given. Corresponding percentage changes relative to general average export volume is given in Figure 6.9. The estimation results show that during 1994 crisis apart from micro-sized firms, the average export sales declined below the general export volume. For all size groups 2001 crisis led to increase in the average export volumes and negative association between the magnitude of the percentage change and size is noteworthy. On the other hand, 2008 crisis caused decline in the export volumes of all size groups and again negative association is observed between the magnitude of decline and size. The highest decline occurred in the export volume of micro and small sized firms, whereas the decline in the export volume of medium and large sized firms is relatively limited.



Source: Author's own calculations

Figure 6.8 Estimated Export Volumes for Different Size Groups



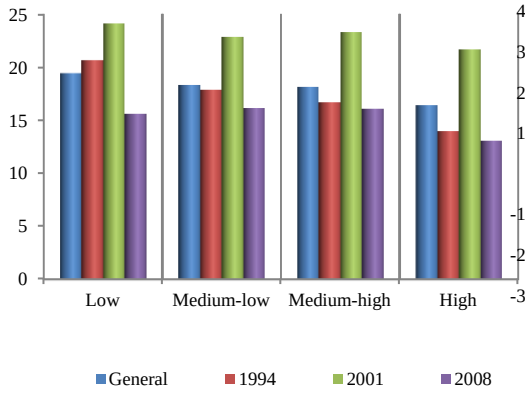
Source: Author's own calculations

Figure 6.9 Percentage Changes During Crises Relative to General Pattern

The estimated impacts of crises on export volumes according to different technological intensity and the corresponding percentage

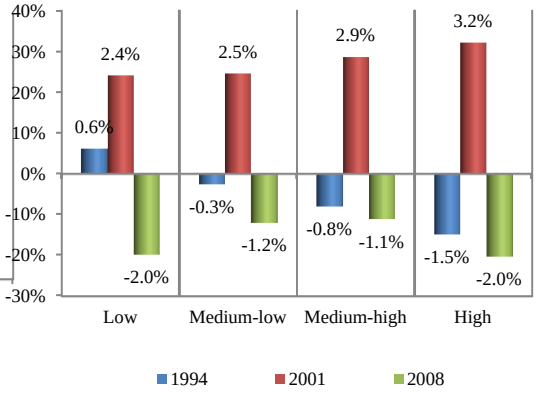
[36] The sample averages that are used for independent variables are given in Appendix C.

changes relative to general export volumes are given in Figure 6.10 and Figure 6.11 respectively. Estimation results reveal that while 1994 and 2001 crisis led to an increase in the average export volumes for the firms in low-tech sectors, 2008 crisis caused reduction in the average export volumes. The results of this investigation show that for the case of 1994 crisis, there is a negative association between the impact of the crisis and technological sophistication. While 1994 crisis led to increase in the export volumes of the low-tech firms, the impact of 1994 crisis became increasingly adverse as sector's technological intensity increases. However, for 2001 crisis, the positive impact is higher for medium-high and high-tech intense firms when compared with low and medium-low tech firms. The most recent 2008 global crisis seems to be the most effective for low-tech and high-tech firms.



Source: Author's own calculations

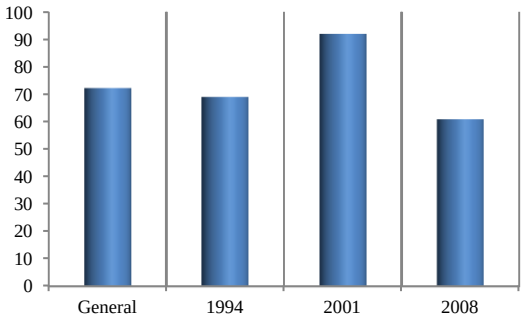
Figure 6.10 Estimated Average Export Volume for Technological Intense Sector Groups



Source: Author's own calculations

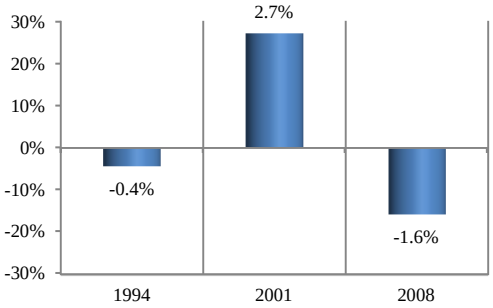
Figure 6.11 Percentage Changes During Crises Relative to General Pattern

The overall impact of crises on intensive margin is portrayed in Figure 6.12 and Figure 6.13 respectively. According to estimation results, it is observed that 1994 and 2008 crises led to decline in the intensive margins of export whereas 2001 crisis caused an increase.



Source: Author's own calculations.

Figure 6.12 Calculated Average Intensive Margins of Export



Source: Author's own calculations.

Figure 6.13 Impact of Crises on Intensive Margins of Exports

6.4.3 Assessment the Impact of Crises on Extensive and Intensive Margins of Exports

In order to explore the impact of the crises on both extensive and intensive margins of exports, the overall evaluation of the findings will be discussed in this section. The following diagrams were used to summarize the findings of this thesis regarding the impact of crises.

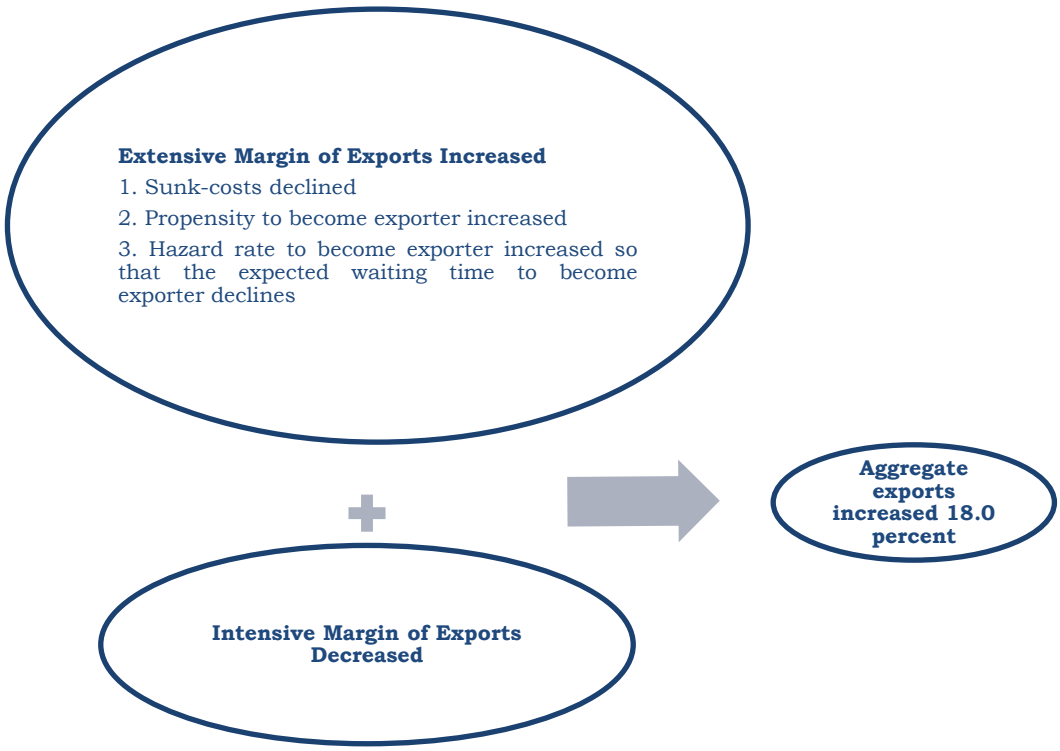


Figure 6.14 Impact of 1994 Crisis on Export Behavior

In Figure 6.14, the findings regarding the impact of 1994 crisis on export behavior of the Turkish manufacturing firms are summarized. With 1994 crisis the aggregate exports increased 18 percent. Our findings suggest that with 1994 crisis sunk-costs declined in which facilitated entry into export markets. Accordingly it has been found that both propensity and hazard ratio to become exporter increased. These findings revealed that 1994 crisis increased the extensive margins of exports. On the other hand, it has been concluded that intensive margins of exports declined with 1994 crisis. Increase in intensive margins dominated the decline in extensive margins so that we observe 18 percent increase in aggregate exports.

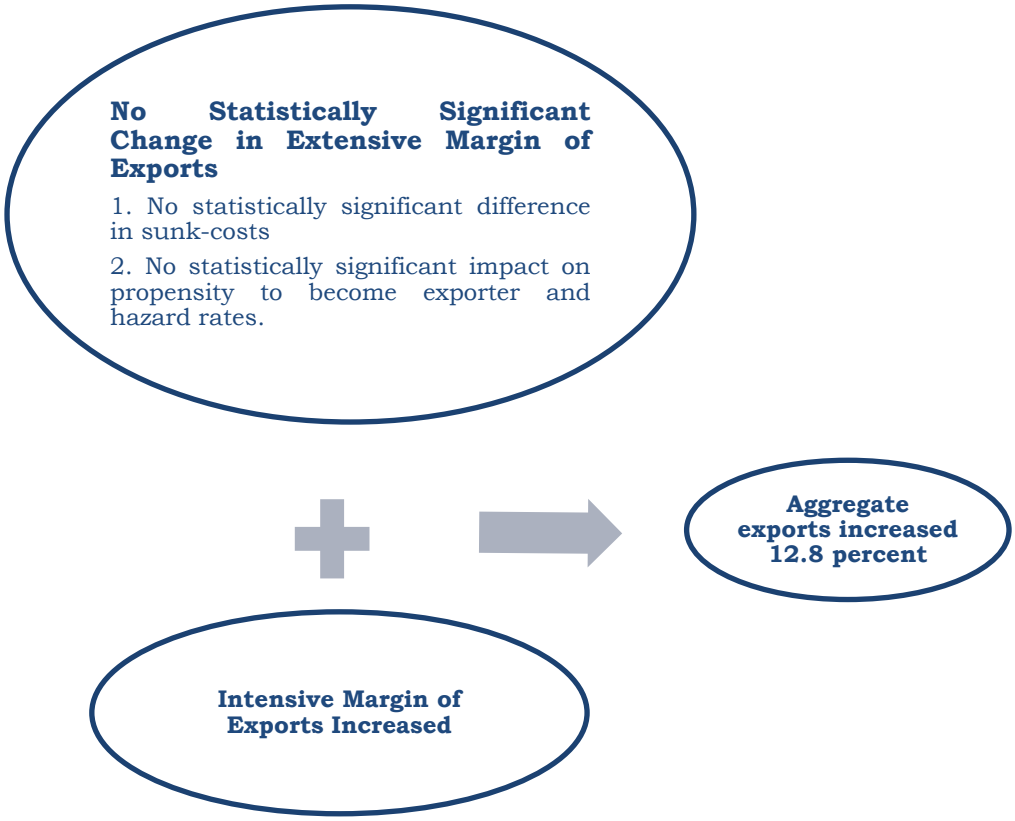


Figure 6.15 Impact of 2001 crisis on Export Behavior

Figure 6.15 displays the summary of the findings related with the 2001 crisis. It has been concluded that 2001 crisis has no statistically significant impact on the extensive margin of trade since no significant impact on export decision of the firms was found. On the other hand, the results indicate that intensive margins of exports increased during 2001 crisis. Therefore, the observed increase in aggregate exports could be attributed to intensive margins of exports.

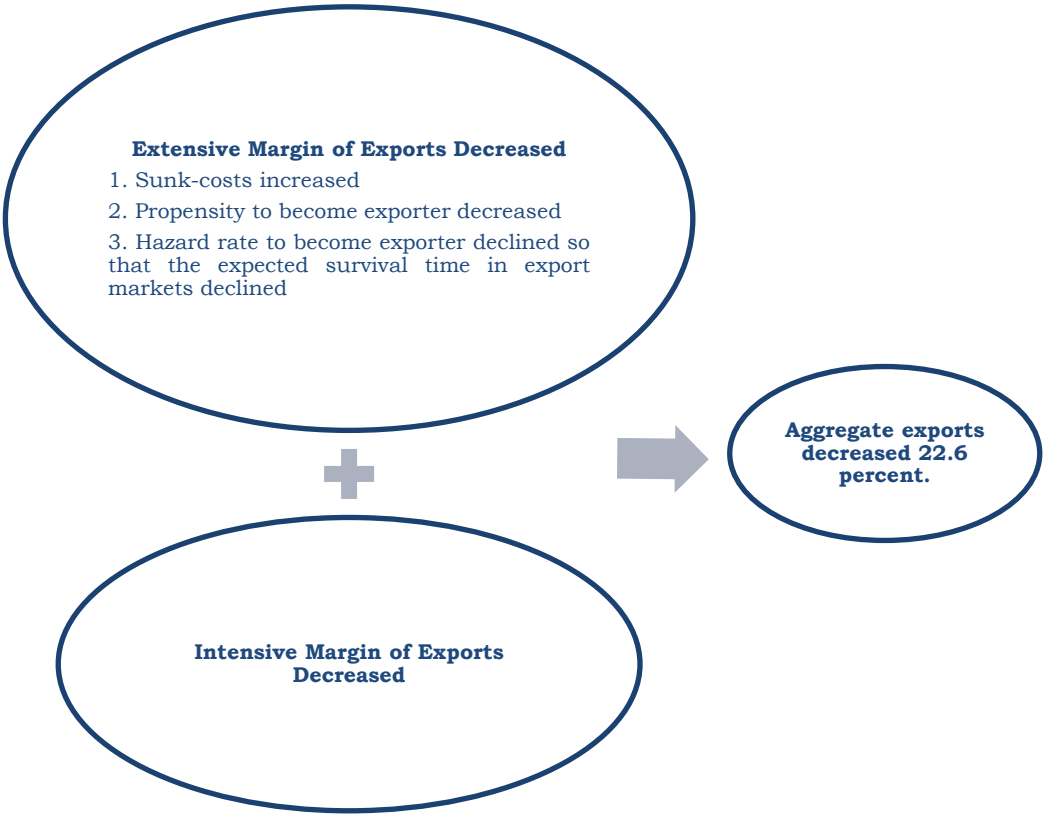


Figure 6.16 Impact of 2008 crisis on Export Behavior

The most striking change in exports observed with 2008 crisis. The aggregate exports declined sharply by 22.6 percent in 2009. Figure 6.16 summarizes the findings of this thesis that are related with 2008 crisis. Findings show that 2008 crisis caused decrease both in extensive and in intensive margins of exports. Therefore, this considerable decline in exports might be explained by simultaneous reduction of intensive and extensive margins of exports.

CHAPTER 7
CONCLUSION

CONCLUSION

Turkish economy replaced its import substitution industrialization regime with outward-oriented export-led growth strategy with "24 January Decisions" in 1980. Since then, export has been considered as one of the main determinants of sustainable economic growth and export supporting policies have been adopted. Exports have been responded to generous export incentives and continuous real depreciations and increased its share in GNP from 4.2 percent in 1980 to 25 percent in 2000s. Moreover, Turkish export-orientation has been undergoing a substantial sectoral transformation from agriculture to manufacturing.

Although there are many studies that assess Turkey's export performance from macro-perspective, micro-level analysis seems to have attracted little attention contrary to recent empirical trade literature. However, in the recent trade literature, increasing availability of micro-level data has shifted focus from industries and countries to firms and products. The prominent attention to firm-level analysis in trade literature relies on the fact that empirical findings from micro data highlighted the importance of firm heterogeneity on export behavior. These findings have constituted challenges to traditional trade theories and have led to the development of "new" new trade theories of firm heterogeneity and international trade. Considering firm-heterogeneity not only provides predictions that are consistent with the empirical findings but also yields additional predictions about exchange rate-trade relation.

This thesis has examined the export behavior of Turkish manufacturing firms comprehensively by using a stream of analysis. Using firm-level data for 1989-2010 period we explore the characteristics of the firms, their export behavior, decision to export, export market entry-exit dynamics and export behavior under crisis. Based on existing empirical

literature, the export performance differences between exporters and non-exporters investigated through simple descriptive and regression analysis. Estimation results imply that exporters are on average more efficient (larger, more productive and more profitable), more quality oriented (spending more for R&D, marketing and advertisement) and less credit constrained. However, during the crisis periods the export premia are shrinking which implies crisis leads to reduction in the average percentage differences between exporters and non-exporters.

It is also observed that larger, more productive and more capital-intensive firms self-select into export markets. Findings of this thesis also reveal that learning-effect of exportation leads to improvements in size, productivity and financial health of the firms. Moreover, after entering into export markets, firms become more quality oriented and more profitable.

In order to determine the factors that influence the export market participation decision of the firms, dynamic discrete choice model is utilized. The estimation results reveal that previous export market experience plays crucial role in the current export status of the firms. Referring to the hystersis literature, significant impact of previous export status implies existence of sunk-entry costs into export markets. Existence of sunk-costs explains the self-selection of better firms into export markets. Those large, productive and capital-intensive firms can afford high export sunk-costs. In addition to previous export status, firm's efficiency level, financial health and quality competitiveness are found to be significant determinant for the propensity to become exporter. Another important finding emerges from this analysis is that importance of sunk-costs varies with the occurence of crises. It has been shown that during 1994 crisis sunk-costs declined whereas for 2001 crisis there was no statistically significant change in the sunk-costs and in 2008 crisis it declined. Consistent with the sunk-cost variations, it has been found that occurence of 1994 crisis led to increase in the propensity to become exporter and 2008 crisis decreased the propensity. No statistically significant impact is observed for the case of 2001 crisis.

Existence of sunk-costs not only explains self-selectivity of exporters but also highlights the importance of timin decision of the firms. Again referring to hystersis literature, Dixit type models predict that existence of sunk-costs creates persistence in the export status of the firms. On the other hand, existence of sunk-costs may affect the export market entry timing decision of firms, since non-exporters have opportunity to wait for more suitable conditions. Export market entry-exit dynamics investigation reveals that the hazard ratio of becoming exporter is higher for larger, more productive, less credit constrained and more capital-intensive firms. An interesting finding to emerge from exit dynamics is that profitability in domestic markets decreases the hazard rate to become exporter. This implies that less profitable firms self-select into export markets and low profitability level motivates for entry into export markets. When the factors that affect the survival of the exporters are considered, it is observed that the survival rate of large, more productive, less credit constraint and more quality oriented firms that are producing low-tech products is higher. Comparing entry and exit dynamics of the firms shows that asymetic relation exists between technological intensity and hazard ratios. Hazard ratios both for becoming exporter and for ceasing export activity is lower which implies entry of low-tech firms into export markets takes longer time but when they enter into export markets their survivals are longer. Moreover, consistent with the sunk-costs' variations the crisis dummies in the duration analysis showed that 1994 and 2008 crisis had a significant impact on the hazard ratio of becoming exporter. While 1994 crisis shortened the expected waiting time to become exporter, with 2008 crisis the expected waiting time to become exporter increased.

In the fifth chapter, we have shown that export premium shrunk during the crisis periods. It has been also observed that sunk-costs varied with the occurrence of crises. Moreover, crises affect both export propensity and entry-exit dynamics of the firms. All these results entail the significant impact of crisis on export behavior. Gathering findings from different analyses provides a coherent story for the impact of three recent economic crises on export behaviour of Turkish manufacturing firms. 1994 crisis led

to reduction in the sunk entry costs and this facilitated export market entry for micro sized low tech firms. During 1994 crisis more firms became exporter which led to increase in extensive margins of exports. Although, the set of exporters extended the average export volume declined during 1994 crisis since the new enterants have poor performance. This implies that the number of new exporters is the key driver of the 18 percent increase during 1994 crisis.

For the case of 2001 crisis, on the other hand, no statistically significant change in the sunk-costs is observed, correspondingly, no statistically significant impact of 2001 crisis on export propensity and on entry dynamics is observed. These findings suggest that 2001 crisis did not lead to any change in the extensive margins of exports. However, the estimation results showed that with 2001 crisis the average export volume increased which implies 12.8 percent increase in 2001 is mainly explained by intensive margin of exports.

Finally, collapse in trade in 2008-2009, stemmed from declines both in extensive and intensive margins of exports. Deterioration of extensive margins refers to a more restrictive situation for exports since reduction of extensive margins of exports implies new exporters and new export relations will not able to grow. On the contrary, when the intensive margin deteriorates then firms will able to recover previous exports levels when demand conditions improve.

Findings of this thesis have some policy implications. First of all, negative association between the technological sophistication and export volume together with the negative impact of capital intensity on export volume shows the comparative advantage of Turkey in low-tech products. However, in 2008 crisis, negative coefficient estimate for low-tech sector dummy on exportation probability of pre-crisis exporters reflects that Turkey's comparative advantage in low-tech products is under threat. However, estimation results also show the importance of marketing-advertisement expenditures on export performance of the firms. Therefore, in order to preserve export market position, Turkish manufacturing firms

should either focus on upgrading non-price competition power without changing sector or specialize in more sophisticated sectors.

The estimation results as a whole showed the importance of the size on the export behavior of the Turkish manufacturing firms. The main conclusion is that the probability of entry into export markets and then survival probability of the micro, small and medium sized (MSM) firms is fairly low. Moreover, when the impact of crises investigated, it is observed that while the most productive and large incumbent exporters are able to overcome the adverse effects of disruptions, some of the MSM exporters cannot cope with the crisis and they are forced to exit the export markets. Besides, the consequences of the crisis are worse for some of the MSM purely domestic producers; the least productive ones disappear. However, SMEs play a particularly important role for the Turkish economy due to the fact that SME's are the predominant source of employment. Therefore, protective policies for the SME exporters will provide support to withdrawing chronic high unemployment rates downwards which is the biggest problem of the Turkish economy.

Another significant finding of this thesis is the importance of credit constraints on export behavior. Estimation results show that credit constraint which is an indicator for the accessibility of the external financing sources plays crucial role on the export participation decision, entry-exit dynamics and export volume decisions of the firms. Even for large, productive and profitable firms, export behavior depends heavily on credit constraints. Therefore, in order to encourage firms for export market participation, to increase the survival rate of the new export starters and also to increase the export volume, more effective measures should be implemented to allow easier access to financial sources. For Turkey, since alternative financial instruments are not well developed, banking sector constitutes the backbone of the external financing sources. The prerequisite for motivating banks to lend to companies is to provide stable economic conditions. Under unstable economic conditions, banks prefer to purchase government bonds and then make loans only to large firms in order to protect themselves. For this reason, the health of the banking sector and its

willingness to provide credit, especially to SMEs, has great importance. Healthier banking system has been attained at a great extent with the Banking Sector Reconstruction Programme that was launched after the crisis in May 2001. However, the reluctance of banks to provide loans to the enterprises (especially to SMEs) is still a problem. The main reason for the reluctance of the banks in providing credits to SMEs is the lack of healthy and reliable evaluation mechanism for the default risks of credits. Government should encourage banks to develop an objective evaluation mechanism. Moreover, alternative financing tools can be developed.

The results of this thesis show that marketing and advertisement expenditure that is considered as non-price competitiveness or quality indicator, is important determinant for the export behavior of the firms. Moreover, it is important to highlight that contrary to general belief, we find strong evidence that impact of exchange rate on export behavior is fairly limited when compared with the non-price competitiveness measure. Consequently, valued currency policies alone will not serve for obtaining sustainable export growth. Instead, policies that help to improve non-price competition of the Turkish manufacturing firms will work. Therefore, competitiveness of the firms should be increased via policies that contain more structural changes in place of being obsessive about the undervalued currency policies. Especially for increasing the survival rate and survival duration of the existing exporters, quality competition plays crucial role. Quality competition can be attained by investing to marketing and advertisement. Nowadays with the increasing use of internet, marketing and advertisement activities came to be done more quickly and easily. Therefore, firms should be informed about the possible benefits of internet usage and they should be encouraged for increasing their information and communication technology usage capacities.

As noted in the introduction, the direct goal of this thesis has been to explore the export behavior of Turkish manufacturing firms. We believe that using this comprehensive data and employing existing techniques extensively add substantially to our understanding of the issue. In a broader perspective, we would further argue that this thesis makes a wider

contribution to the recent empirical trade literature. Hence contributions of this thesis can be summarized as follows: First and foremost, this thesis contributes to this ongoing and developing literature using Turkish data. Secondly, unlike previous studies that investigates single feature of the export behavior, in this thesis stream of analysis merged to shed light on the export behavior of firms. Using same data set for a sequence of analysis has explored the opportunity to come up with a coherent story. Thirdly, using Turkish economy's crisis experience and advantage of our data set, three recent crises have been considered and this adds substantially to our understanding of export behavior under crisis. Lastly, using alternative quality measures, R&D expenditures and marketing-advertisement expenditures, assist in our understanding the role of quality on export behavior. The results of this thesis indicate that Turkish manufacturing firms prefer marketing and advertisement to R&D as quality investment. Hence for developing countries, like Turkey, considering only R&D expenditure as a measure of quality can lead misleading results for quality-export relation.

This study constitutes the first step of examining export performance of Turkish manufacturing sector and impact of different specific types of crisis on export performance of Turkey from micro perspective. The constructed explanatory variables based on availability of the data are in line with the existing literature. However, as mentioned before, since dataset contains mainly financial variables, some structural firm-specific variables can not be considered in our analysis. Specifically, foreign ownership may affect the export behavior of the firms via several channels. FDI is considered as the most important channel for technology spillovers from foreign to domestic firms in emerging economies. Moreover, for foreign owned firms financing constraints are lower than domestic firms. Hence, the impact of Foreign Direct Investment (FDI) on export behavior has been drawn attention for the recent period. Therefore, gathering information for the foreign-ownership from CBRT Foreign-ownership Survey will enable to investigate the links between foreign ownership, innovation and exporting at firm-level. Besides, using same dataset and same methodology the

econometric investigation can be replicated for the service sector. This will enable to establish similarities and differences in export behavior of Turkish manufacturing and services firms. This will provide an extensive investigation that ascertains the export behaviour of Turkish firms.

REFERENCES

Akbostancı, E. (2004). Dynamics of the Trade Balance: The Turkish J-Curve. Emerging Markets Finace and Trade, 40(5), 57-73.

Akgüngör, S., Barbaros, F., & Kumral, N. (2002). Competitiveness of the Turkish Fruit and Vegetable Processing Industry in the EU Market. Russian and East European Finance and Trade, 38(3), May-June.

Akyüz, Y., & Boratav, K. (2002). Türkiye'de Finansal Krizin Oluşumu. İktisat, İşletme ve Finans , 15-45.

Albornoz, F., & Ercolani, M. (2007). Learning by Exporting: Do Firm Characteristics Matter? Evidence from Argentinian Panel Data. Discussion Papers Department of Economics, University of Birmingham , 07 (17).

Aldan, A., & Günay, M. (2008). Entry to Export Markets and Productivity: Analysis of Matched Firms in Turkey. CBRT Research and Monetary Policy Department Working Paper No: 08/05.

Alvarez, R. (2001). External sources of technological innovation in Chilean manufacturing industry. Estudios de Economia, University of Chile, Department of Economics, 27 (2 Year 20), 53-68.

Amiti, M., & Weinstein, D. E. (2009). Exports and Financial Shocks. NBER Working Paper Series No: 15556.

Ari, A. & Dagtekin, R. (2007). Early Warning Signals of the 2000/2001 Turkish Financial Crisis. MPRA Paper 25857, University Library of Munich, Germany.

Arnold, J. M., & Hussinger, K. (2004). Export Behavior and Firm Productivity in German Manufacturing: A firm-level analysis. International trade 0403007, EconWPA.

Arslan, I., & van Wijnbergen, S. (1993). Export Incentives, Exchange Rate Policy and Export Growth in Turkey. The Review of Economics and Statistics , 75 (1), 128-33.

Atabek, A., & Çevik, S. (2001). Comprehensive Analysis of Turkey's Trade Flow: A Cointegration ECM Approach. Unpublished paper.

Atzeni, G., & Piga, C. (2003). Credit Rationing in High-Tech Firms and Sample Selection. University of Cagliari and Sassari CREoS Working Paper No. 200304

Aw, B. Y., Chung, S., & Roberts, M. (2000). Productivity and Turnover in the Export Market: Micro Evidence from Taiwan and South Korea. World Bank Economic Review, 14, 65-90.

Aw, B., & Hwang, A. (1995). Productivity and the export market: A firm-level analysis. Journal of Development Economics (47), 313-332.

Aydın, M. F., Çıplak, U., Yücel, M. E. (2004). Export Supply and Import Demand Models for Turkish Economy. The Central Bank of the Republic of Turkey Research Department Working Paper, No: 04/09.

Aysan, A. F., & Hacihasanoglu, Y.S. (2007). Investigation on the Determinants of Turkish Export-Boom in 2000s. Boğaziçi University Department of Economics Research Papers, ISS/EC-2007-19.

Baldwin, R. (1989). Sunk-cost hysteresis. NBER Working Paper No.2911.

Baldwin, R., & Krugman, P. (1989). Persistence in Trade Effects of Large Exchange Rate Shocks. Quarterly Journal of Economics , 104, 635-654.

Barlow, R., & Şenses, F. (1995). The Turkish Export Boom: Just Reward or Just Lucky. Journal of Developments Economics , 48, 111-133.

Barrios, S., Görg, H., & Strobl, E. (2003). Explaining Firms' Export Behavior: R&D Spillovers and the Destination Market. Oxford Bulletin of Economics and Statistics, 65(4), 475-496.

Bellone, F., Musso, P., Nesta, L., & Schiavo, S. (2010). Financial Constraints and Firm Export Behavior. The World Economy , 33 (3), 347-373.

Bernard, A. B., & Jensen, B. J. (1995). Exporters, jobs and wages in US manufacturing: 1976-1987. Brookings Papers on Economic Activity Microeconomics , 1995, 67-119.

Bernard, A. B., & Jensen, B. J. (1999a). Exporting and Productivity. NBER Working Papers 7135 .

Bernard, A. B., & Jensen, B. J. (1999b). Exceptional exporter performance: Cause, effect, or both?. Journal of International Economics (47) , 1-25.

Bernard, A. B., & Jensen, J. (2004). Why some firms export. Review of Economics and Statistics , 86 (2), 562-569.

Bernard, A. B., & Wagner, J. (1998). Export entry and exit by German Firms. NBER Working Paper No. 6538.

Bernard, A. B., Jensen, B. J., Redding, S., & Schott, P. (2009). The margins of U.S. Trade. NBER Working Paper 14662.

Besedes, T., & Prusa, T. J. (2007). The Role of Extensive and Intensive Margins and Export Growth. NBER Working Papers 13628.

Bigsten, A., Collier, P., Dercon, S., Fafchamps, M., Gauthier, B., Gunning, J. W., et al. (2004). Exports and Firm-level Efficiency in African Manufacturing. Centre for the Study of African Economies Working Paper, Journal of Development Studies , 40 (3), 115-141.

Bin, Q., Xiuyan, L., Wei, Z., & Kangning, X. (July 2-3, 2012). Learning-by-Exporting or Self-Selection: A PSM-DID Analysis Based on Firm-Level Data of Chinese Manufacturing Sector. Assia Pacific Trade Seminers. Singapore Managment University.

Blalock, G., & Gertler, P. J. (2004). Learning from exporting revisited in a less developed setting. Journal of Development Economics , 75 (2), 397-416.

Blalock, G., & Roy, S. (2007). A Firm-level Examination of the Exports Puzzle: Why East Asian Exports Didn't Increase After the 1997-1998 Financial Crisis. The World Economy , 30 (1), 39-59.

Bricongne, J.,-C., Fontagne, L., Gaulier, G., Taglioni, D., & Vicard, V. (2010). Firms and the Global Crisis: French Exports in the Turmoil. European Central Bank, Working Paper Series No 1245.

Brown, M., Degryse, H., Höwer, D., & Penas, M. F. (2012). How do Banks Screen Innovative Firms? Evidence from Start-up Panel Data. Centre for European Economic Research Discussion Paper No. 12-032.

BRSA Turkey, B. R. (2010). From Crisis to Financial Stability (Turkey Experience). Working Paper (Revised Third Edition).

Buck, T., Liu, X., Wei, Y. & Liu, X. (2007). The trade development prath and export spillovers in China: a missing link?. Management International Review, 47 (5), 683-706.

Bugamelli, M., & Infante, L. (2003). Sunk Costs of Exports. Temi di discussione (Economic working papers) 469, Bank of Italy, Economic Research and International Relations Area.

Cadot, O., Iacovone, L., Pierola, D., & Rauch, F. (2011). Success and Failure of African Exporters. The Selected Works of Olivier Cadot, available at: http//works.bepress.com/ocadot/20

Celasun, O. (1998). The 1994 Currency Crisis in Turkey. The World Bank Development Research Group Policy Research Working Paper 1913.

Chaney, T. (2005). Liquidity constrained exporters. Working Paper University of Chicago.

Chaney, T. (2008). Distorted Gravity: The Intensive and Extensive Margins of International Trade. American Economic Review , 98 (4), 1707-1721.

Clerides, S., Lach, S., & Tybout, J. (1998). Is Learning by Exporting Important? Micro-Dynamic Evidence from Colombia, Mexico and Morroco. Quarterly Journal of Economics , 113 (3), 903-947.

De Loecker, J. (2007). Do exports generate higher productivity? Evidence from Slovenia. Journal of International Economics , 73 (1), 69-98.

Delgado M, A., Farinas, J., & Ruano, S. (2002). Firm Productivity and Export Markets: A Non-parametric Approach. Journal of International Economics, 57, 2, 397–422.

Dixit, A. (1989). Entry and Exit Decisions under Uncertainty. Journal of Political Economy , 97, 620-638.

Dixit, A. (1989). Hysteresis, Import Penetration, and Exchange Rate Pass-through. Quarterly Journal of Economics , 104, 205-228.

Durgut, A. (2002). The 1994 Economic Crisis in Turkey. Unpublished master's thesis for master degree, Naval Postgraduate School, Monterey, California, U.S.A.

Duttangupta, R., & Spilimbergo, A. (2004). What Happened to Asian Export During the Crisis? IMF Staff Papers , 51 (1).

Ericson, R., & Pakes, A. (1995). Markov-perfect industry dynamics: A framework for empirical work. The Review of Economic Studies, 62(1), 53-82.

Erlat, G. & Erlat, H. (2005). Do Turkish Exports Have a Comparative Advantage with Respect to the European Union Market, 1990-2000. Topics in Middle Eastern and North African Economies Journal, 7, 1-18.

Esteve-Perez, S., Lopez- Pallardo V., & Silvente R. F. (2011). The Duration of firm-destination export relationships: Evidence from Spain, 1997-2006. University of Valencia, Working Papers WPAE-2011-02.

Esteve-Perez, S., Manez-Castillejo, J. A., Rochina-Barrachina, M. E., & Sanchis-Llopis, J. A. (2006). A survival analysis of manufacturing firms in export markets. European Trade Study Group Papers.

Fioretti, G. (2005). Credit Rationing and Internal Ratings in the face of Innovation and Uncertainty. (Unpublished)

Freund, C., & Pierola, M. D. (2010). Export entrepreneurs: Evidence from Peru. Policy Research Working Paper Series 5407, The World Bank.

Gencay, R. & Selcuk, F. (2006). Overnight borrowing, interest rates and extreme value theory. European Economic Review, Elsevier, 50(3), 547-563.

Girma, S., D.Greenaway, & R.Kneller. (2003). Export Market Exit and Performance Dynamics: A Causality Analysis of Matched Firms'. Economics Letters , 83 (3), 317-24.

Girma, S., D.Greenaway, & R.Kneller. (2004). Does Exporting Increase Productivity? A Microeconometric Analysis of Matched Firms'. Review of International Economics , 12 (5), 855-66.

Görg, H., Kneller, R., & Muraközy, B. (2008). What makes a successful export? Kiel Working Papers, No. 1339, Kiel Institute for the World Economy.

Greenaway, D., & Kneller, R. (2004). Exporting and Productivity in UK. Oxford Economic Policy , 20, 358-71.

Greenaway, D., Guariglia, A. & Kneller, R. (2007). Financial factors and exporting decisions. Journal of International Economics, 73, 377-395.

Greenaway, D., Sousa, N. & Wakelin, K. (2004). Do domestic firms learn to export from multinationals?. European Journal of Political Economy, 20, 1027-1043.

Greenway, D., & Kneller, R. (2007). Firm heterogeneity, exporting and foreign direct investment. The Economic Journal , F134-F161.

Gros, D., & Selçuki, C. (2013). The Changing Structure of Turkey's Trade and Industrial Competitiveness: Implications for the EU. CEPS Working Paper 03

Gullstrand, J. & Persson, M. (2012). How to Combine High Sunk Costs of Exporting and Low Export Survival. Lund University, Department of Economics, Working Paper 2012:32.

Hall H. B. (2002). The Financing of Research and Development. NBER Working Papers 8773.

Hallward-Driemeier, M., Iarossi, G., & Sokoloff, K. L. (2002). Exports and Manufacturing Productivity in East Asia: A Comparative Analysis with Firm-Level Data. NBER Working Papers 8894.

Head, K., & Ries, J. (2003). Heterogeneity and the FDI versus export decision of Japanese manufacturers. NBER Working Paper No. 10052.

Heckman, J. (1981). The incidental parameters problem and the problem of initial conditions in estimating a discrete time-discrete data stochastic process in C. Manski, & D. McFadden (Ed.), The structural analysis of discrete data. MA:MIT Press , 179-95.

Heckman, J. J. (1979). Sample Selection Bias as a Specification Error. Econometrica, 47 (1), 153-61.

Heckman, J., Ichimura, H., & Todd, P. (1997). Matching as an Econometric Evaluation Estimator: Evidence from Evaluating a Job Training Programme. Review of Economic Studies , 64 (4), 605-654.

Helpman, E., & Krugman, P. R. (1985). Trade Policy and Market Structure. Cambridge: MIT Press.

Ilmakunnas, P., & Nurmi, S. (2010). Dynamics of Export Market Entry and Exit. Scandinavian Journal of Economics , 112 (1), 101-126.

Isgut, A., & Fernandes, A. (2007). Learning-by-Exporting Effects: Are They for Real? MPRA Paper 3121 University Library of Munich.

Jaud, M., & Kukenova, M. (2011). Financial development and survival of African agri-food exports. Policy Research Working Paper Series 5649, The World Bank.

Jovanovic, B. (1982). Selection And The Evolution of Industry. Econometrica , 50 (3), 649-670.

Kapoor, M., Ranjan, P., & Raychaudhuri, J. (2012). The impact of Credit Constraints on Exporting Firms: Empirical Evidence from India. Available at: http://ssrn.com/abstract=2023068.

Kibritçioğlu, A. (2002). Türkiye'de Ekonomik Krizler ve Hükümetler, 1969-2001. Retrieved June 5, 2012, from ECONTURK: www.econturk.org/Turkiyeekonomisi/ytd-kibritcioglu.pdf

Kibritçioğlu, A. (2010). Küresel Finans Krizinin Türkiye'ye Etkileri (Effects of Global Financial Crisis on Turkey), MPRA Paper 29470, University Library of Munich, Germany.

Kılıçaslan, Y., & Erdoğan, L. (2012). Industry Orientation, Exporting and Productivity. Modern Economy , 3, 81-90.

Kleinschmidt, E.J., & Cooper, R.B. (1990). The Performance Impact of an International Orientation on Product Innovation. European Journal of Marketing, 22, 56-71.

Kneller, R. & Pisu, M. (2007). Industrial Linkages and Export Spillovers from FDI. The World Economy, 30(1), 105-134.

Kotable, M. The Relationship between Offshore Sourcing and Innovativeness of U.S. Multinational Firms: An Empirical Investigation. Journal of International Business Studies, 21, 623-638.

Kraay, A. (1999). Exports and Economic Performance:Evidence from a Panel of Chinese Enterprises. mimeo World Bank.

Krugman, P. (1980). Scale economies, product differentiation and the pattern of trade. American Economic Review , 70, 950-959.

Krugman, P. (1989). Exchange Rate Instability. Cambridge, MA: The MIT Press.

Kumar, N., & Siddharthan, N. S. (1994). Technology, Firm Size and Export Behavior in Developing Countries. Journal of Development Studies , 32 (2), 288-309.

Leuven, E., & Sianesi, B. (2003). PSMATCH2: Stata module to perform full Mahalanbois and propensity score matching, common suppport graphing, and covariate imbalance testing. Software, http://ideas.repec.org/c/boc/bocode/s432001.html.

Ma, Y., Tang, H., & Zhang, Y. (2011). Factor Intensity, Product Switching, and Productivity: Evidence from Chinese Exporters. Development Working Papers 324, Centro Studi Luca d'Agliano, University of Milano.

Maggioni, D. (2012). Learning by Exporting in Turkey: An Investigation for Existence and Channels. Global Economy Journal , 12 (2).

Manova, K. (2008). Credit Constraints, Heterogenous Firms and International trade. NBER Working Paper Series 14531.

Melitz, M. J. (2003). The impact of trade on intra-industry reallocations and aggregate industry productivity. Econometrica , 71 (6), 1695-1725.

Minetti, R., & Zhu, S. C. (2011). Credit constraints and firm export: Microeconomic evidence from Italy. Journal of International Economics , 83 (2), 109-125.

Muuls, M. (2008). Exporters and credit contraints. A firm-level approach. National Bank of Belgium Working Paper Research 139.

Nguyen, H., & Nishihima, S. (2009). Export Intensity amd Impacts from Firm Characteristics, Domestic Competition and Domestic Constraints in Vietnam: A Micro-data Analysis. Discussion Paper Series 238, Research Institute for Economics & Business Administration, Kobe University.

Özatay, F. (1996). The Lesson from the 1994 Crisis in Turkey: Public Debt (Mis) Managment and Confidence Crisis. Yapı Kredi Economic Review , 7 (1).

Özatay, F. (2000). A Quarterly Macroeconomic Model for a Highly and Indebted Country: Turkey. Economic Modelling, 17 (1), 1-11.

Özler, Ş., Taymaz, E., & Yılmaz, K. (2009). History matters for the export decision: Plant-level evidence from Turkish manufacturing industry. World Development , 37 (2), 479-488.

Pencarelli, T., Splendiani, S., & Nobili, E. (2010). Small Businesses Strategies in Times of Crisis: Empirical Evidence from the Province of Pesaro-Urbino. 10th Global Conference on Business & Economics. Rome.

Perez, S., Llopis, A., & Llopis, J. (2004). The Determinants of Survival of Spanish Manufacturing Firms. Review of Industrial Organization , 25 (3), 251-273.

Roberts, M. J., & Tybout, J. R. (1997). The Decision to Export in Colombia: An Empirical Model of Entry with Sunk Costs. American Economic Review , 87 (4), 545-64.

Rosenbaum, P., & Rubin, D. B. (1983). The Central Role of the Propensity Score in Observational Studies for Causal Effects. Biometrika , 70, 4155.

Sabuhoro, B., & Gervais, Y. (2004). Factors Determining the Success or Failure of Canadian Establishments on Foreign Markets: A Survival Analysis Approach. Analytical Studies Branch Research Paper Series 2004220e, Statistics Canada, Analytic Studies Branch.

Şahinbeyoğlu, G., & Ulaşan, B. (1999). An Empirical Examination o the Structural Stability of Export Function: The Case of Turkey. TCMB, Research Department, No:9907.

Salvatore, D. (1995). International Economics. Englewood Cliffs, New Jersey, USA: Prenctice-Hall, Inc.

Saygılı, M., Şahinbeyoğlu, G., & Özbay, P. (1998). Competitiveness indicators and the equilibrium real exchange rates dynamics in Turkey. Macroeconomic Analysis of Turkey: Essays on Current Issues (ed.) EM Üçer, Central Bank of the Republic of Turkey, 51-100.

Sinani, E., & Hobdari, B. (2010). Export market participation with sunk costs and firm heterogenity. Applied Economics , 42, 3195-3207.

Sivri, U., & Usta, C. (2001). Reel Döviz Kuru, İhracat ve İthalat Arasındaki İlişki. Uludağ Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi, 19 (4).

Srinivasan, T.N., & Archana, V. (2009). India in the Global and Regional Trade: Determinants of Aggregate and Bilateral Determinants of Aggregate and Bilateral Trade Flows and Firm's Decision to Export. Indian Council of Research on International Economic Relations Working Paper No. 232.

Sutton, J. (1991). Sunk Costs and Market Structure: Price Competition, Adversting, and Evolution of Concentration. MIT Press

Terzi, H., & Zengin, A. (1995). Türkiye'de Kur Politikası, İthalat, İhracat ve Dış Ticaret Dengesi İlişkisinin Ekonometrik Analizi. Gazi Üniversitesi İ.İ.B.F Dergisi, 11, 247-266.

Terzi, H., & Zengin, A. (1999). Kur Politikasının Dış Ticaret Dengesini Sağlamada Etkinliği: Türkiye Uygulaması. Ekonomik Yaklaşım, 10 (33), 48-65.

Topcu, B. A., & Kılavuz, E. (2012). Revealed Comparative Advantage and Competitiveness of the Turkish Manufacturing Sector in the European Market. International Journal of Economics and Finance Studies , 4 (2), 21-35.

Üçer, M., Van Rijckeghem, C., & Yolalan, R. (1998). Leading Indicators of Currency Crisis: A Brief Literature Survey and An Application to Turley. Yapı Kredi Economic Review , 9 (2), 3-23.

Uygur, E. (1997). Export Policies and Performance: The Case of Turkey. ERF Working Paper Series 9707.

Vogel, A. & Wagner, J. (2009). Exports and Profitability -First Evidence for German Business Services Enterprises. Working Paper Series in Economics, 129, University of Lüneburg, Institute of Economics.

Wagner, J. (2002). The causal effects of exports on firm size and labor productivity: first evidence from a matching approach. Economic Letters , 77 (2), 287-292.

Wagner, J. (2007). Exports and Productivity: A Survey of the Evidence from Firm Level Data. The World Economy , 30 (1), 60-82.

Wagner, J. (2010). The Post-Entry Performance of Cohorts pf Export Starters in German Manufacturing Industries. IZA Discussion Papers 5183, Institute for the Study of Labor (IZA).

Wakelin, K. (1998). Innovation and Export Behavior at the Firm Level. Research Policy , 26, 829-841.

Wooldridge, J. (1995). Selection Correction for Panel Data Models under Conditional Mean Independence Assumptions. Journal of Econometrics, 68, 115-132.

Wooldridge, J. (2005). Simple solutions to the initial conditions problem for dynamic, nonlinear panel data models with unobserved heterogeneity. Journal of Applied Economics, 20, 39-54, 2005. , 20,39-54.

Yang, Y., & Mallick, S. (2010). Export Premium, Self-selection and Learning-by-Exporting: Evidence from Chinese Matched Firms. The World Economy , 33 (10), 1217-2140.

Yasar, M., & Rejesus, R. (2005). Exporting Status and Firm Performance: Evidence from a Matched Sample. Economics Letters , 88,3,397-402.

Yasar, M., Garcia, P., Nelson, C., & Rejesus, R. (2007). Is there Evidence of Learning-by-Exporting in Turkish Manufacturing Industries? International Review of Applied Economics , 21 (2), 292-305.

Yasar, M., Nelson, C., & Rejesus, R. (2003). Productivity and Exporting Status of Manufacturing Firms: Evidence from Quantile Regression. Emory University Department of Economics Working Paper 03-23.

Yılmaz, B. (2003). Turkey's Competitiveness in the European Union: A Comparison with Five Candidate Countries- Bulgaria, The Czech Republic, Hungary, Poland and Romania- and the EU15. Ezoneplus Working Paper, No. 12, February.

Yılmaz, B. (2008). Foreign Trade Specilization and International Competitiveness of Greece, Portugal, Spain, Turkey and the EU 12. Center for European Studies Working Paper Series 166.

Yücel, M., & Yıldırım, Y. (15-16 April 2010). The Last Three Significant Crises That Faced in Turkey's Economy and Their Effects to Manufacturing Sector. Turgut Özal International Conference on Economics and Politics-I Global Crises and Economic Governance. Malatya/ Turkey.

Appendix A

Manufacturing Sectors in Turkey, NACE Rev 1.1

NACE Code	Manufacturing Sector	Abbreviation
DA 15	Manufacture of food products and beverages	Food
DA 16	Manufacture of tobacco products	Tobacco
DA 17	Manufacture of textiles	Textiles
DA 18	Manufacture of wearing apparel	Wearing
DA 19	Tanning and dressing of leather	Leather
DA 20	Manufacture of wood and of products of wood and cork	Wood
DA 21	Manufacture of pulp, paper and paper products	Paper
DA 22	Publishing, printing and reproduction of recorded media	Publishing
DA 23	Manufacture of coke, refined petroleum	Petroleum
DA 24	Manufacture of chemicals and chemical products	Chemicals
DA 25	Manufacture of rubber and plastic products	Plastics
DA 26	Manufacture of other non-metallic mineral products	Non-metallic minerals
DA 27	Manufacture of basic metals	Basic metals
DA 28	Manufacture of fabricated metal products, n.e.c.	Fabricated metals
DA 29	Manufacture of machinery and equipment n.e.c.	Machinery
DA 30	Manufacture of office machinery and computers	Office mach.
DA 31	Manufacture of electrical machinery and apparatus n.e.c.	Electrical mach.
DA 32	Manufacture of radio, TV and communication equipments	Radio, TV
DA 33	Manufacture of medical, precision and optical instruments	Medical
DA 34	Manufacture of motor vehicles, trailers and semi-trailers	Motor Vehicles
DA 35	Manufacture of other transport equipment	Other Transport
DA 36	Manufacture of furniture; manufacturing n.e.c.	Furniture

Appendix B

Joint Significance Test Results

Ho:	MicroxD94-MicroxD01=0	F(3, 6765) = 2.55

	MicroxD94-MicroxD08=0 MicroxD94=0	Prob > F = 0.05
Ho:	SmallxD94-SmallxD01=0 SmallxD94-SmallxD08=0 SmallxD94=0	F(3, 6765) = 2.76 Prob > F = 0.04
Ho:	LargexD94-LargexD01=0 LargexD94-LargexD08=0 LargexD94=0	F(3, 6765) = 2.45 Prob > F = 0.06
Ho:	Medium-LowxD94-Medium-LowxD01=0 Medium-LowxD94-Medium-LowxD08=0 Medium-LowxD94=0	F(3, 6765) = 10.00 Prob > F = 0.00
Ho:	Medium-HighxD94-Medium-HighxD01=0 Medium-HighxD94-Medium-HighxD08=0 Medium-HighxD94=0	F(3, 6765) = 20.75 Prob > F = 0.00
Ho:	HighxD94-HighxD01=0 HighxD94-HighxD08=0 HighxD94=0	F(3, 6765) = 6.37 Prob > F = 0.00
Ho:	ProductivityxD94-ProductivityxD01=0 ProductivityxD94-ProductivityxD08=0 ProductivityxD94=0	F(3, 6765) = 13.24 Prob > F = 0.00
Ho:	ProfitabilityxD94-ProfitabilityxD01=0 ProfitabilityxD94-ProfitabilityxD08=0 ProfitabilityxD94=0	F(3, 6765) = 2.55 Prob > F = 0.05
Ho:	Credit ConstraintxD94-Credit ConstraintxD01=0 Credit ConstraintxD94-Credit ConstraintxD08=0 Credit ConstraintxD94=0	F(3, 6765) = 23.04 Prob > F = 0.00
Ho:	LiquidityxD94-LiquidityxD01=0 LiquidityxD94-LiquidityxD08=0 LiquidityxD94=0	F(3, 6765) = 1.23 Prob > F = 0.30
Ho:	Capital IntensityxD94-Capital IntensityxD01=0 Capital IntensityxD94-Capital IntensityxD08=0 Capital IntensityxD94=0	F(3, 6765) = 3.32 Prob > F = 0.02
Ho:	R&D ExpensesxD94-R&D ExpensesxD01=0 R&D ExpensesxD94-R&D ExpensesxD08=0 R&D ExpensesxD94=0	F(3, 6765) = 2.67 Prob > F = 0.05
Ho:	MarketingxD94-MarketingxD01=0 MarketingxD94-MarketingxD08=0 MarketingxD94=0	F(3, 6765) = 5.49 Prob > F = 0.00
Ho:	Inverse MillsxD94- Inverse MillsxD01=0 Inverse MillsxD94- Inverse MillsxD08=0 Inverse MillsxD94=0	F(3, 6765) = 18.34 Prob > F = 0.00
Ho:	D94-D01=0 D94-D08=0 D94=0	F(3, 6765) = 2.94 Prob > F = 0.03

APPENDIX C

Sample Averages for the Independent Variables

		Technological Intensity			
Size Group		**Low**	**Medium-low**	**Medium-High**	**High**
Micro	Productivity	5.11	5.27	5.00	4.44
	Credit Constraints	0.21	0.17	0.18	0.13
	Capital Intensity	2.77	3.16	2.90	2.50

	Profitability	1.79	1.79	1.79	1.76
	Liquidity	0.27	0.28	0.30	0.27
	R&D Expenses	0.00	0.01	0.01	0.00
	Marketing Expenses	0.16	0.15	0.14	0.12
	Inverse Mills	1.31	1.44	1.35	1.27
Small	Productivity	5.05	4.86	4.83	4.67
	Credit Constraints	0.22	0.21	0.19	0.17
	Capital Intensity	2.72	3.03	2.82	2.52
	Profitability	1.79	1.79	1.80	1.80
	Liquidity	0.30	0.31	0.33	0.32
	R&D Expenses	0.01	0.01	0.02	0.02
	Marketing Expenses	0.22	0.18	0.19	0.17
	Inverse Mills	0.96	1.00	0.79	0.70
Medium	Productivity	4.90	5.00	4.92	4.76
	Credit Constraints	0.28	0.24	0.24	0.22
	Capital Intensity	2.89	3.39	3.10	2.84
	Profitability	1.80	1.80	1.80	1.80
	Liquidity	0.34	0.33	0.35	0.36
	R&D Expenses	0.01	0.01	0.02	0.03
	Marketing Expenses	0.26	0.25	0.25	0.20
	Inverse Mills	0.49	0.57	0.43	0.39
Large	Productivity	4.86	5.45	5.39	5.41
	Credit Constraints	0.34	0.29	0.27	0.26
	Capital Intensity	3.36	4.10	3.68	3.74
	Profitability	1.80	1.80	1.80	1.81
	Liquidity	0.34	0.33	0.36	0.36
	R&D Expenses	0.01	0.01	0.03	0.10
	Marketing Expenses	0.31	0.32	0.31	0.28
	Inverse Mills	0.21	0.23	0.19	0.08

APPENDIX D

Curriculum Vitae

PERSONAL INFORMATION

Surname, Name: Demirhan Atabek, Aslıhan

Nationality: Cypriot and Turkish (TC)

Date and Place of Birth: 1 March 1978, Nicosia (T.R.N.C)

Marital Status: Married

Phone: + 90 312 507 54 39

Email: aslihan.atabek@tcmb.gov.tr

EDUCATION

Degree	Institution	Year of Graduation
MS	LSE Econometrics and Mathematical Economics	2004
Diploma	LSE Econometrics and Mathematical Economics	2003
BS	METU Statistics	1999
BS (Minor)	METU Industrial Engineering	1999
High School	Türk Maarif Collage, Cyprus	1994

WORK EXPERIENCE

Year	Place	Enrollment
2005- Present	CBRT-Research Department	Economist
2001-2005	CBRT-Statistics Department	Expert Statistician
1999-2001	CBRT- Statistics Department	Statistician

FOREIGN LANGUAGE

Advanced English, Beginner French.

PUBLICATIONS

BOOKS

"A Composite Leading Indicator for the Turkish Economic Activity" (with S. Şahinöz and E. Erdoğan Coşar), *CBRT Book*, ISBN 975-6184-07-8, September 2005.

JOURNAL PUBLICATIONS

*"Ekonomide Saat Kaç? Bileşik Göstergeler ve Ekonomi Saati Yaklaşımı" (with E. Erdoğan Coşar), İktisat İşletme ve Finans, Bilgesel Yayıncılık, Vol. 28(322), pages 9-34, 2013.

*"Ramazan ayı, üretim için de on bir ayın sultanı mı?", İktisat İşletme ve Finans, Bilgesel Yayıncılık, Vol. 26(302), pages 109-124, 2011.

"Investigating the Pass Through from Producer Prices to Consumer Prices by Different Approaches: Case of Turkey" (with S. Şahinöz and E. Erdoğan Coşar), *TİSK Academy*, Vol. 4, September 2007.

***** "A New Composite Leading Indicator for the Turkish Economic Activity" (with S. Şahinöz and E. Erdoğan Coşar), *Emerging Markets Finance and Trade*, Vol.41, No.1, 45-64, 2005.

"Building up an Export Expectation Index for Turkey" (with S. Şahinöz and E. Erdoğan Coşar), *Journal of Statistical Research*, April 2005.

"Persistency of Output Flactuations: The Case of Turkey", Central Bank Review 1 (2005) 9-21.

OTHERS

"Belirsizlikler Altında Yatırım Planları", (with Y. Arslan, T. Hülagü and S. Şahinöz), CBT Economic Notes 1213, Research and Monetary Policy Department, Central Bank of the Republic of Turkey, 2012.

"İktisadi Faaliyet Analizi: Öncü Göstergeler ve Ekonomi Saati Yaklaşımı," (with E. Erdoğan Coşar), CBT Economic Notes 1202, Research and Monetary Policy Department, Central Bank of the Republic of Turkey, 2012.

"Expectation Errors, Uncertainty and Economic Activity," (with Y. Arslan, T. Hülagü and S. Şahinöz), Working Papers 1117, Research and Monetary Policy Department, Central Bank of the Republic of Turkey, 2011.

"Belirsizliklerin İktisadi Faaliyet Üzerindeki Etkileri," with Y. Arslan, T. Hülagü and S. Şahinöz), CBT Economic Notes 1120, Research and Monetary Policy Department, Central Bank of the Republic of Turkey, 2011.

"Mevsimsel Modellerde Çalışma Günü Değişkeni," (with O. Atuk, E. Erdoğan Coşar and Ç. Sarıkaya), CBT Economic Notes 0903, Research and Monetary Policy Department, Central Bank of the Republic of Turkey, 2009.

(*) indicates SSCI.

APPENDIX E

Turkish Summary

Yıllardır insanlar ihtiyaçlarını karşılayabilmek amacıyla mal ve hizmet takası yapmaktadır. lkelerin farklı kaynak ve farklı teknolojilere sahip olması göreceli avantaja sebep olmaktadır. öreceli avantaj ise ülkeler arası ticaretin temelini oluşturmaktadır. Ticaret, insanlık kadar eski olduğundan uluslararası ticaret yazını gerek teorik gerekse uygulamalı alanda oldukça zengindir.

Uluslararası ticaret yazınında teorik çerçeve merkantilizm diye adlandırılan en eski ekonomik doktirin ile başlamıştır. erkantalistlere göre ülkelerin sahip oldukları değerli metaller ülkenin zenginliğini göstermektedir. u nedenle, merkantalist yaklaşıma göre, ülkenin zenginliğini artırabilmek için ithalatı sınırlayıp, ihracatı destekleyecek yaptırımların uygulanması gerekmektedir. erkantalist görüşün aksine, geleneksel ticaret teorileri, serbest ticareti savunmaktadırlar. Serbest ticaretin kazanımlarını göstermek için karşılaştırmalı üstünlük kavramı öne sürülmüştür. Karşılaştırmalı üstünlük kavramı uluslararası ticaret yazınınında önemli bir yer edinmiştir. Uzun süre bu kavrama dayanarak uluslararası ticaret ilişkileri açıklanmaya çalışılmıştır. Her ne kadar geleneksel ticaret toerileri, endüstriler arası ticareti açıklamak için tatmin edici olsa da, gözlemler, bu teorilerin eksikliklerini gözler önüne sermiştir. Dış ticaret rakamları, nispeten benzer ürünlerin ticaretinin yapıldığını göstermektedir. Benzer ürünlerin ticaretini açıklamaya yönelik Krugman, yeni ticaret modeli adı altında ilk teorik modeli önermiştir. Her ne kadar geleneksel ve yeni ticaret modelleri uluslarası ticaret yazınına önemli katkılar sağlamışlar olsalar da bütün firmaların aynı olduğuna ilişkin varsayım üzerine inşa edilmiş olmaları son dönemde en büyük eleştiri noktasını oluşturmaktadır.

Nitekim mikro bazlı verilerin artması ile birlikte yapılan uygulamalı çalışmalar, firmalar arası farklılaşmanın yüksek olduğunu göstermiştir. Ampirik bu bulgu, son dönem “yeni” yeniticaret modellerin (“new” new trade models) gelişmesine neden olmuştur. Melitz (2003), Krugman modelini firma heterojenliğini dahil ederek değiştirmiştir. Yapılan bu değişiklikle birlikte model öngörüleri ampirik gözlemleri açıklar niteliğe kavuşmuştur.

Son dönemde firma heterojenliği varsayımı ticaret modellerinin temelini oluşturmaktadır.

Yukarıda da belirtildiği üzere, uluslararası ticaret yazınında ampirik çalışmalar teorik modellere öncülük etmiştir. Bernard ve Jensen'a (2005) ait çalışma, ticaret yazını için bir dönüm noktasıdır. . ernard ve Jensen (2005), Amerika Birleşik Devletleri (ABD) imalat sanayi rekabetçiliğine ilişkin tartışmalara katkıda bulunmak amacıyla firma bazında geniş bir panel veri seti kullanmışlardır. Bu yolla, şimdiye kadar yapılan çalışmalardan farklı olarak ülke veya sektörlerden çok, ihracatçı olan firmaların imalat sektörüne katkılarını inceleme olanağı bulmuşlardır. Yazarlar, kullandıkları basit betimsel ve regresyon analizleri ile tipik bir ihracatçı firmanın daha büyük, daha üretken, daha fazla maaş ödeyen ve daha sermaye yoğun olduklarını göstermişlerdir. Bu çalışma ve bulgulardaha sonra birçok ülke örneği için temel oluşturmuştur. . hracatçı firmaların üstünlüğü, birçok gelişmiş ve gelişmekte olan ülke verisi ile sınanmış ve benzer sonuçlar elde edilmiştir.

İhracatçı firmaların üstünlüğü konusunda elde edilen yaygın sonuçlar, ticaret yazınında yeni bir pencere açmıştır. İhracatçı firmaların üstünlüğünü açıklayabilmek için iki hipotez öne sürülmüştür. İlki; kendi kendine seçim (self-selection) hipotezi olarak isimlendirilmiştir. Kendi kendine seçim hipotezine göre ihracatçı firmalar, ihracata başlamadan önce zaten üstün özelliklere sahiptirler ve varolan üstün özellikleri sayesinde ihracatçı olmaktadırlar. İkinci hipoteze göre ise; firmalar ihracat yaparak daha iyi performansa sahip olmaktadırlar. Bu hipotez ise ihracat yaparak öğrenme (learning-by-exporting) olarak isimlendirilmektedir. Yapılan çalışmalar ağırlıklı olarak ihracatçı firmaların kendi kendilerini seçtiklerini göstermiştir. Ancak, son dönemde gelişen teknikler ve gelişmekte olan ülke verilerinin kullanımı ile birlikte her iki hipotezin de geçerli olduğuna dair deliller artmaktadır.

Histerezis modeller; yüksek battı maliyetlerinin ihracat statüsünde atalete neden olduğunu göstermiştir (Dixit ,1989a, 1989b; Baldwin, 1989; Baldwin ve Krugman, 1989; Krugman, 1989). Roberts ve Tybout (1997), histerezis modellerin öngörüleri ışığında battı maliyetlerin varlığını sınamak için devingen kesitli seçim modeli (dynamic discrete choice model)

kullanılmasını önermiş. ir. Tahmin edilen devingen kesitli seçim modelinde, gecikmeli bağımlı değişkene ait katsayının pozitif ve istatistiksel olarak anlamlı bulunması, mevcut dönem ihracat kararında ihracat deneyiminin önemli katkısı olduğu sonucunu doğurmaktadır. Bu çerçevede, ihracat deneyiminin mevcut ihracat kararını etkiliyor olması battı maliyetlerinin varlığından kaynaklandığı öne sürülmektedir. Roberts ve Tybout, Kolombiya imalat sanayi firmalarına ait verileri kullanarak battı maliyetlerin varlığını sınamıştır. Tahmin sonuçları battı maliyetlerin firmaların ihracat kararlarında önemli etkiye sahip olduğunu göstermiştir. Daha sonra, bu yaklaşım birçok farklı araştırmacı tarafından battı maliyetlerin varlığını sınamak amacıyla kullanılmıştır. Sonuçlar, ihracat piyasalarına girişte firmaların yüksek battı maliyetleri ile karşı karşıya kaldıklarını göstermiştir.

Battı maliyetlerin varlığı, ihracatçı olup olmama kararına ek olarak, ihracatçı olma süresini de etkilemektedir. İlgili yazında gösterilmiştir ki; battı maliyetlerin varlığı bazı ihracatçı firmaların olumsuz şartları belli bir dönem için göz ardı etmeleri için zorlamaktadır. Öte yandan, ihracatçı olmayan firmalar ise olumsuz şartlar altında ihracata başlama kararlarını erteleme gibi bir lükse sahiptirler. Bu çerçevede bakıldığında, battı maliyetleri sadece firmaların ihracat kararları üzerinde değil zamanlama kararları üzerinde de etkili olduğunu göstermektedir. Son dönemde yapılan çalışmalar, battı maliyetlerin ima ettiği bu kanalı süre modelleri kullanarak incelemeye başlamıştır.

2008 yılında ABD'de başlayan ve kısa sürede birçok ekonomiyi etkisi altına alan finansal kriz sonrası ticaret yazınında finansal şokların ihracat davranışları üzerindeki etkisi sıkça tartışılan bir konu olmaya başlamıştır. Özellikle "yeni" yeni ticaret modellerinin öngördüğü üzere ticaret engellerindeki değişimler, yayılma (extensive) ve yoğunluk (intensive) marjlarını etkilemektedir. Bu öngörüler doğrultusunda son dönemde finansal krizin yayılma ve yoğunluk ticaret marjları üzerindeki etkisi ayrı ayrı incelenmektedir.

Türkiye,1980'li yılların başında mali piyasalarda ve dış ticarette serbestleşme amacı ile birçok gelişmekte olan ekonomide olduğu gibi bir dizi yapısal dönüşümler içeren program uygulamaya başlamıştır. Ekonomik yazında "24 Ocak 1980 Kararları" olarak yer alan bu ekonomik dönüşüm

programı ile dışa kapalı-ithal ikamesine dönük sanayileşme stratejisi terk edilmiş dışa açıkihracata yönelik büyüme stratejisi benimsenmeye başlanmıştır. 1980'lerde başlayan serbestleşme süreci ile ihracat, sürdürülebilir büyümenin en önemli unsurlarından biri olarak Kabul edilmiştir. İhracat için birçok teşvik verilmiş, 1990'ların sonlarına kadar uygulanan kur politikaları da ihracatı destekler nitelikte olmuştur. Uygulanan politikalar kısa süre içerisinde sonuç vermeye başlamıştır. 1980 yılında milli gelir içerisinde yüzde 4.2'lik paya sahip olan ihracat, 2000'li yıllara gelindiğinde payını yüzde 25'lere çıkarmıştır. İhracatçı firma sayısı da her geçen gün artarak devam etmektedir.

Türkiye'nin ihracat performansı birçok çalışmaya konu olmuştur. Bu çalışmaların çoğunda ihracat performansı makrobazda ele alınmıştır. Ancak, son yirmi yıllık dönemde ticaret yazınında, gerek uygulamalı gerekse teorik çalışmalarda, ilgi makro'dan mikrodüzey incelemeye kaymıştır. Bu değişimin ana nedeni, . mikrobazlı veri setlerinin son dönemlerde bulunabilirliliğidir. Ayrıca, ampirik çalışmalar, firmaların çoktürel (heterogeneous) olduğuna dair önemli deliller sunmaktadır. Firmalar arasındaki farklılaşmaları yakalayabilmek için firma bazlı incelemeler önem kazanmış ve çoktürel firma varsayımı gerek uygulamalı gerekse teorik modellerin temelini oluşturmaya başlamıştır. Bu nedenle, son dönemde ihracat performansları firma bazlı çalışmalar ile incelenmektedir.

Büyüyen ve zenginleşen uygulamalı yazının aksine Türkiye için firma bazında yapılan çalışmalar oldukça sınırlıdır. Bu alanda,Yasar ve ark. (2003), Yasar ve Rejesus (2005), Yasar ve ark. (2007), Özler ve ark. (2009)ve Maggioni (2012), Türkiye İstatik Kurumuna (TÜİK) ait verileri, Aldan ve Günay (2008) Türkiye Cumhuriyet Merkez Bankasına (TCMB) ait verileri ve Kılıçaslan ve Erdoğan (2012) İstanbul Ticaret Odasının her yıl açıkladığı en büyük ilk 500 firmaya ait verileri kullanıp, ağırlıklı olarak ihracat yaparak öğrenme (learning-by-exporting) varsayımının Türkiye için geçerliliğini test etmiştir. Bu çalışmalar arasında sadece Özler ve ark.(2009), diğer çalışmalardan farklı olarak ihracat piyasalarına girerken, battı maliyetlerin varlığını incelemiştir.

Özellikle son dönemde ihracatın artan önemine rağmen mikro bazlı çalışmaların oldukça sınırlı olması bu çalışmanın temel motivasyonunu

oluşturmaktadır. Bu çalışmanın amacı, farklı mikroekonometrik yöntemler kullanarak Türk imalat firmalarının ihracat davranışlarını belirlemek ve bu konudaki eksiklikleri gidermektir. Bu amaçla, mevcut ampirik yazında yer alan yaklaşımlar takip edilerek firmaların ihracat davranışları detaylı bir şekilde incelenmiştir. Bunlara ek olarak, Türkiye ekonomisinin kriz deneyimlerinden yararlanarak, firmaların krizlere verdikleri tepkiler ihracat kararları çerçevesinde araştırılmıştır.

Çalışmada, TCMB Sektör Bilançoları kullanılmıştır. TCMB, 1989 yılından bu yana yıllık olarak reel sektörde faaliyet gösteren firmalardan temin edilen mali tablo ve kimlik bilgilerini, NACE Rev 1.1 sınıflandırmasını esas alarak derlemektedir. Mali tablo, firmaların bilanço ve gelir tablosundan oluşmaktadır. Kimlik bilgileri ise firmaların çalışan sayısı, faaliyet gösterdiği sektör, bulunduğu il, yaşı ve hukuki durumu gibi bilgileri içermektedir. Çalışmada, 1989-2010 dönemine ait veriler kullanılmıştır. Toplam ihracat içerisinde mal ihracatının yüksek paya sahip olması nedeni ile bu çalışmada sadece imalat sanayi firmaları dikkate alınmıştır.

Çalışmaya katılan her firma için kimlik numarası verilmekte ve firmaya ait bilgiler yıllar itibarıyla takip edilebilmektedir. Ancak ankete katılım gönüllülük esasına dayandığı için firmaların sürekli katılımı veya katılımın olduğu yıllarda tüm bilgilerin tam olarak sağlanması beklenmemelidir. Bu nedenle elde edilen veri seti dengesiz paneldir (unbalanced panel). Bu kapsamlı ve değerli veri seti, ilk aşamada tüm diğer veri setlerine yapıldığı gibi, gözden geçirilmiştir. Gözden geçirme, tutarlı ve güvenilir analiz ve sonuçlar için gereklidir. Katılımın gönüllülük esasına dayanması nedeni ile bazı firmalar eksik bilgi veya analizler için yeterli gözlem sayısını sağlayamadığı için analizlere dail edilmemiştir. Gözlem süresince en az iki ardışık yıl çalışmaya katılmayan veya en az üç yıl katılım sağlamayan firmalar veri setinden dışlanmıştır.

Firmaların katılım sağlamamasının asıl nedeni bilinmemektedir. Katılımın olmaması firmanın ilgili dönemde bilgilerini paylaşmak istememesine bağlı olabileceği gibi firmanın artık faaliyet göstermemesinden de kaynaklanabilmektedir. Bu nedenle en az üç yıllık verisi olmayan firmaların dışlanması, başarılı firmaların seçimi ile yanlılık yaratabileceği şeklinde eleştirilere neden olabilir. Ancak, veri setinde bu özellikleri

sağlayan firma sayısının oldukça az olduğu vurgulanmalıdır. Söz konusu veri setinde dışlanan firma sayısı 271, bu firmalara ait gözlem sayısı da 1664'tür. Bu da toplam gözlem sayısının sadece yüzde 1,9'na denk gelmektedir. Nihai veri seti, 8738 imalat sanayi firmasına ait 86675 gözlemden oluşmaktadır.

Çalışan sayısı, bu tezde kullanılan analizler için önemli bir değişkendir. Bazı firmalar bu bilgiyi bazı yıllar için bildirmemiştir. Bazı firmaların ise çalışan sayısına ilişkin bilgilerinin hatalı olduğu gözlenmiştir. Eksik ya da hatalı -çalışan sayısı- bilgisi olan firmaların dışlanması yerine eksik veriler, basit bir imputasyon algoritması kullanılarak doldurulmuştur. İmputasyon süreci ilk önce hatalı girişlerin kontrol edilmesi ve belirlenmesi ile başlamıştır. Gözlem sayısı dikkate alındığında firma bazında veri girişlerinin kontrolu pratikte mümkün değildir. Bu nedenle, "duruma özel" (ad-hoc) yöntem kullanılarak bilgi girişlerinin hatalı olup olmadığı tespit edilmiştir. Eğer, girilen çalışan sayısı, firmanın ortanca çalışan sayısının on katından fazla ise bu veri girişi hatalı olarak kabul edilip ilgili giriş silinmektedir. Bu yöntemle, 86675 gözlemin 184 tanesi uç değer olarak değerlendirilmiştir. Uç değer olarak bulunup eksik olarak sınıflandırılan gözlem sayıları dahil veri setinde toplam 870 gözleme ait çalışan sayısı eksiktir. Aşağıda özetlenen basit algoritma kullanılarak eksik değerler doldurulmuştur:

(1) Eğer X_t değeri eksik ise fakat X_{t-1} ve X_{t+1} değerleri eksik değil ise bu durumda $X_t$için $(X_{t-1} + X_{t+1})/2$ değeri atfedilmiştir.

(2) Eğer X_t ve X_{t-1} değerleri eksik ancak X_{t+1} değeri eksik değil ise eksik olan $X_t$değeri yerine X_{t+1} değeri kullanılmıştır.

(3) Eğer$X_t$veX_{t+1}değerleri eksik ancak X_{t-1}değeri eksik değil ise bu durumda eksik olan $X_t$değeri yerine X_{t-1} değeri kullanılmıştır.

Veri setindeki gözlem sayısı oldukça yüksek olmasına rağmen örneklemin temsiliyet gücü sorgulanabilir. Bu nedenle, bazı göstergeler TÜİK tarafından yayınlanan Yıllık Hizmet ve Sanayi İstatistikleri ile karılaştırılmıştır. Ortalamada örneklemde yer alan 4152 firma, sayı itibarıyla popülasyonun sadece yüzde 1,4'üne karşılık gelmektedir. Ancak

çalışan sayısına göre, popülasyonun yüzde 34'ünü, ciroya göre ise yüzde 67,3'lük kısmını kapsamaktadır. Kapsama oranları gözönüne alındığında örnekleme dahil edilmeyen firmaların, genellikle toplam çıktıya önemli katkısı olmayan mikro ölçekli firmalar olduğu görülmektedir. Dünya Bankasının, 2008 yılında Türk imalat sanayi için yapmış olduğu çalışmaya göre; mikro ölçekli firmalar genellikle ihracat faaliyetinde bulunmamaktadırlar. Buna göre, her ne kadar, özellikle firma sayısı bakımından örneklemin temsiliyet gücü zayıf olarak görülse bile yukarıda verilen muhakemeler doğrultusunda mevcut veri setinin bu tezin amacına yönelik yeterli temsil gücüne sahip olduğu sonucuna varılmıştır. Nitekim, örneklemden elde edilen toplam net satış ve yurtdışı satışlar, milli gelir ve toplam imalat sanayi ihracat rakamları ile karşılaştırıldığında, veri setininin temsiliyet gücünün yeterli olduğuna dair varsayımımız desteklenmektedir (Şekil 3.2- Şekil 3.5).

Bu tezde, Türk imalat sanayi sektöründe faaliyet gösteren firmaların ihracat davranışları mevcut yazın takip edilerek incelenmiştir. İhracat davranışlarına ilişkin incelemeye başlamadan önce örneklemde yer alan firmaları daha yakından tanıyabilmek amacıyla betimsel analizler yapılmıştır. Buna göre, bu veri setinde yer alan tipik bir Türk imalat firması, orta ölçekli olup Marmara bölgesinde faaliyet gösteren bir anonim şirkettir. Firma sayılarının ve net satışların sektörel dağılımına bakıldığında, Türk imalat sanayinin ağırlıklı olarak gıda, dayanıklı olmayan tüketim malları ve metalik olmayan mineral ürünlerin üretiminide yoğunlaştığı görülmektedir. Ancak, zaman içerisinde net satış gelişimleri, sektörel dönüşüme işaret etmektedir. Türk imalat sanayinin zaman içerisinde düşük teknoloji yoğun sektörlerden (gıda, tekstil ve giyim.), motorlu kara taşıtları, ofis makinaları ve diğer ulaşım araçları gibi teknoloji yoğun sektörlere yöneldiği gözlenmiştir.

İhracatçı firma oranına bakıldığında, ortalamada imalat sanayi firmalarının yüzde 62,7'si üretimlerinin bir kısmını ihraç etmektedir. Net satışlarda gözlenen sektörel dönüşümün benzeri ihracatçı sektörlerde de gözlenmektedir. 1990'lı yıllarda, ihracat, ağırlıklı olarak gıda, tekstil ve giyim ürünlerinden oluşurken 2000'li yıllara gelindiğinde gıda, tekstil ve giyime ek olarak motorlu kara taşıtları, kimyasallar, ana metal ve metal

eşya sanayi ürünleri de Türk imalat sanayi ihracatında önemli paya sahip olmaya başlamıştır. Son olarak, firmaların hizmet ettikleri piyasalara ilişkin kararlarında inatçı oldukları gözlenmiştir. Piyasa seçiminde gözlenen bu ısrarcı davranış biçimi bu konunun daha detaylı bir şekilde incelenmesi için motivasyon sağlamıştır.

Birçok farklı değişken firmaların ihracat davranışlarında etkili olabilmektedir. Önceki çalışmalar, bize, değişken seçiminde yol gösterici olmuştur. Ancak önemle vurgulanmalıdır ki; mevcut yazında aynı değişken için farklı tanımlar kullanılabilmektedir. Bunun temel nedeni farklı veri setlerinde farklı verilerin mevcut olmasıdır. Bu çalışmada değişken seçimi veri setinin elverdiği ölçüde ilgili yazınla uyumlu bir şekilde yapılmıştır. Önceki çalışmalar gösteriyor ki firmaların etkinliği (efficiency), mali durumu ve kaliteli üretimi ihracat davranışları üzerinde önemli paya sahiptir.

Bu çerçevede, firma etkinliğini ölçmek amacıyla firma büyüklüğü, üretkenliği ve karlılığı kullanılmıştır. Firma büyüklüğünü ölçerken, toplam çalışan sayısı kullanılmıştır. Firmanın üretkenliği, çalışan başına yapılan net satışla ölçülürken, faaliyet karının net satışa oranı ise firmaların karlılığına ilişkin bir gösterge olarak seçilmiştir.

Firmaların mali durumunu gözlemleyebilmek için kredi kısıtı ve likidite oranı olmak üzere iki ayrı değişken oluşturulmuştur. Kredi kısıtı finansal borçlanma gücünü göstermekte ve banka kredilerinin toplam yükümlülükler içerisindeki payı olarak tanımlanmıştır. Kredi kısıtı firmaların dış kaynaklı finansman bulabilme gücünü göstermektedir. Oluşturulan bu değişken sıfır ile bir arasında değer almaktadır. Kredi kısıtı değişkeni sıfıra yaklaştıkça kredi kısıtının artışına işaret etmektedir. Likidite oranı ise kısa vadeli alacakların toplam varlıklar içerisindeki payı olarak tanımlanmıştır. Likidite oranı iç kaynaklı finansmanlar için bir gösterge niteliği taşımaktadır.

İhracat ile kaliteli üretim arasında pozitif bir ilişki olması beklenmektedir. Araştırma geliştirme kaliteli üretim için önemli bir gösterge olarak kabul edilmiştir. Ancak, özellikle gelişmekte olan ülkelerde, özel sektör firmaların araştırma geliştirme yatırımlarının oldukça sınırlı olduğu görülmektedir. Gelişmekte olan ülkeler ,teknolojiyi üretmek yerine makina-teçhizat gibi sermaye yatırımı ile teknolojiyi ithal etmeyi tercih etmektedir.

Öte yandan, sanayi iktisadı yazınına göre pazarlama, reklam ve dağıtım masrafları da kalite rekabeti için önemli göstergelerdir. una göre kaliteli üretime ilişkin üç farklı değişken oluşturulmuştur. Firmaların teknolojiye yaptıkları yatırımları görebilmek için araştırma geliştirme harcamalarının toplam faaliyet giderleri içerisindeki payı kullanılmıştır. Pazarlama,reklam ve dağıtım harcamalarının toplam faaliyet giderleri içerisindeki payı, firmaların kalite rekabetini temsil etmesi için oluşturulmuştur. Son olarak, sermaye yoğunluğu olarak adlandırılan değişken çalışan başına düşen maddi duran varlıklarla ifade edilmiştir.

Firma bazlı faktörlere ek olarak, genel makroekonomik gelişmelerin de firmaların ihracat kararları üzerinde etkili olduğu bilinen bir gerçektir. Bu nedenle modellerde kullanılmak üzere reel döviz kuru, yurtiçi ve yurtdışı talep göstergeleri oluşturulmuştur. Ayrıca, Türkiye ekonomisi için önemli etkiler yaratan 1994, 2001 ve 2008 krizlerine ait kriz kuklaları da . nalizlere dahil edilmiştir.

Daha önce de belirtildiği üzere, mevcut ticaret yazını takip edilerek bu tezde farklı yönleri ile firmaların ihracat davranışları incelenmiştir. hracatçı ve ihracatçı olmayan firmalar arasındaki farkı incelemek amacıyla, oluşturulan firma bazlı ölçütler, basit betimsel analizler kullanılarak incelenmiştir. Buna göre görsel inceleme sonuçları, ihracatçı firmaların üstünlüğüne işaret etmektedir. İhracatçı firmaların daha verimli, daha kalite odaklı ve finansal olarak daha sağlıklı oldukları gözlenmiştir. Daha sonra ihracatçı firmaların üstünlüğü regresyon analizler ile teyit edilmiştir. Regresyon analizlerinden elde edilen bir başka bulgu ise kriz dönemlerindeihracatçı firmalar ile ihracatçı olmayan firmalar arasındaki farkın azaldığıdır.

İhracatçı firmaların üstünlüğünün kaynağını araştırmaya yönelik ileri analizler kullanılmıştır. endikendine seçim hipotezi, müstakbel ihracatçılar ile ihracatçı olmayan firmaların ihracat piyasalarına girmeden önceki performans ölçütlerinin karşılaştırılması ile yapılmaktadır. İhracat yaparak öğrenme (learning-by-exporting) hipotezi ise eğilim puanı karşılaştırma (propensity score matching) yöntemi kullanılarak sınanmıştır. Test sonuçları, Türk imalat firmaları için, kendi kendine seçim (self-selection) ve ihracat yaparak öğrenme (learning-by-exporting) hipotezlerinin

geçerli olduğunu göstermiştir. Elde ettiğimiz bu sonuç, son dönemde gelişmekte olan ülkeler için yapılan çalışma sonuçları ile tutarlılık göstermektedir. icaret yazınında ihracatçı firmaların kendi kendine seçildiğine ilişkin güçlü kanıtlar, ihracat piyasalarına giriş için sabit battı maliyetlerin varlığına işaret etmektedir.

Dixit benzeri teorik modellerin öngörüsü battı maliyetleri, mevcut dönem ihracat kararları üzerinde ihracat deneyimlerinin önemini artırmaktadır. oberts ve Tybout (1997), çalışmalarında, bu öngörüyü kullanarak battı maliyetlerinin varlığını devingen kesitli seçim modeli (dynamic discrete choice model) ile sınanmasını önermiştir. Devingen kesitli seçim model sonuçları battı maliyetlerinin varlığını desteklemektedir. hracat deneyiminin etkisi ihracat piyasalarında çıkar çıkmaz yok olmamakla birlikte azalarak devam etmektedir. ahmin sonuçlarına göre, iki yıl arka arkaya ihracat piyasalarında yer almayan firmaların ihracat piyasalarına girebilmek için tekrar battı maliyetlerini karşılaması gerekmektedir. irma bazlı değişkenlerin ihracatçı olma iştahı üzerindeki etkilerine bakacak olursak, beklenildiği üzere daha verimli, daha kalite odaklı ve mali açıdan daha sağlıklı olan firmaların ihracatçı olma eğilimlerinin daha yüksek olduğu gözlenmiştir. Bu analizden çıkan bir başka çarpıcı sonuç ise battı maliyetlerin krizlerle birlikte değişim göstermesidir Tahmin sonuçları 1994 krizi ile birlikte battı maliyetlerinin azaldığına ve 1994 krizinin ihracatçı olma olasılığını artırdığına işaret etmektedir. 2008 krizinde ise battı maliyetlerin arttığı ve bununla birlikte 2008 yılında ihracatçı olma iştahının azaldığı sonucuna varılmıştır.

Süre modelleri kullanılarak firmaların ihracat piyasalarına giriş-çıkış devingenleri incelenmiştir. lde edilen sonuçlar önceki bulguları teyit etmekle birlikte ek bulgular da sağlamıştır. İhracat piyasasına giriş, devingen model sonuçları daha büyük, daha üretken ve daha az kredi kısıtı olan firmaların, ihracatçı olma tehlike oranının daha yüksek olduğunu göstermiştir. Bir başka deyişle, daha büyük, daha üretken ve daha az kredi kısıtı olan firmaların, ihracatçı olmak için bekleme süresi daha kısadır. Bu bulgu daha önce elde edilen iyi firmaların ihracat piyasalarına kendi kendilerini seçtiklerine ilişkin sonucu bir başka açıdan teyit etmektedir. üyüklük, üretkenlik ve kredi kısıtına ek olarak karlılığın da firmaların ihracatçı olma

tehlike oranını etkileyen bir başka faktör olduğu görülmüştür. Ancak karlılık ile tehlike oranı arasında tahmin edilen negatif ve istatistiksel olarak anlamlı ilişki, iç piyasada daha az kar elde eden firmaların ihracatçı olma tehlike oranının daha yüksek olduğuna işaret etmektedir. Çıkış devingen model sonuçları ise beklenildiği gibi, daha verimli, daha kalite odaklı ve mali açıdan daha sağlıklı olan ihracatçıların sağ kalım oranlarının daha yüksek olduğunu ortaya koymuştur. Giriş ve çıkış devingen model sonuçları karşılaştırıldığında, kalite rekabetinin ihracatçı olmak için ön şart olmasa dahi uluslararası piyasalarda sağ kalım için gerekli olduğunu göstermiştir. Devingen modellerde kriz etkilerine bakıldığında battı maliyetlerde gözlenen değişimle uyumlu olacak şekilde 1994 krizinin, ihracatçı olma süresini kısalttığı, 2008 krizinin ise ihracatçı olma süresini arttırdığı gözlenmiştir. Ayrıca 2008 krizi, ihracatçı firmaların sağ kalım süreleri üzerinde de olumsuz etki yarattığı sonucuna ulaşılmıştır.

Dördüncü bölümde, farklı analizlerden elde edilen ortak sonuç: Krizlerin ihracat davranışları üzerinde etkili olduğudur. egresyon modeller ile hesaplanan ihracat priminin kriz dönemlerinde azaldığı görülmüştür. attı maliyetlerinin kriz dönemlerinde değişim gösterdiği sonucuna varılmıştır.. riz kuklaları ihracatçı olma iştahı ve firmaların ihracat piyasalarına giriş-çıkış devingenliğini istatistiksel olarak anlamlı bir şekilde etkilemektedir. üm bu bulgular, krizlerin firmaların ihracat davranışları üzerinde etkili olduğunu göstermektedir. u tezin beşinci bölümünde, krizlerin ihracat davranışları üzerindeki etkisi detaylı bir şekilde incelenmiştir.

Türkiye ekonomisinin deneyimlediği farklı krizleri daha yakından inceleyebilmek amacıyla ilk önce Kibritçioğlu'nun (2002) önerdiği yaklaşım kullanılarak, krizlerin türleri belirlenmeye çalışılmıştır. Buna göre 1994, 2001 ve 2008 krizleri reel sektör, döviz kuru ve enflasyon kriz türlerini barındıran,derin etkileri olan krizler olarak nitelendirilmiştir (Bakınız Grafik 6.2). Bu farklı krizlerin özellikleri detaylı incelendiğinde, 1994 krizinin, ağırlıklı olarak kamu kesimi bütçe açığı ve cari açık kaynaklı olduğu ve Türkiye ekonomisini derinden etkilediği gözlenmiştir.1994 krizi, temel olarak yıkıcı ancak,kısa süreli olarak tanımlanmaktadır.

2001 krizi ise "bankacılık sektörü krizi" olarak yazında yerini almıştır. ralık 1999 tarihinde yüksek enflasyon oranlarıyla mücadele etmek

amacı ile IMF destekli istikrar programı uygulanmaya konulmuştur. u program, kısa süre içerisinde olumlu sonuçlar doğurmuştur. ygulamanın başlandıcından kısa bir süre sonra faiz ve enflasyon oranlarında hızlı bir düşüş gerçekleşmiştir. ynı dönemde, TL, değer kazanmaya başlamıştır. üşen faiz oranları ve değerlenen TL ile birlikte iç talepte yüksek oranlı artışlar gözlenmiştir. Tüketimdeki bu artışın özellikle tüketim malı ithalatı kaynaklı olması dış ticaret açığını olumsuz yönde etkilemeye başlamıştır. Ayrıca, artan iç talep ve değerlenen TL sonucunda, ihracat gerilemeye başlamış ve dış ticaret açığı artış eğilimi içerisine girmiştir. Cari açığın sürdürülebilirliğine ilişkin kaygılara ek olarak beklenen özelleştirmelerin gerçekleşmemesi, mali piyasalardaki endişeyi artırmıştır. Krizin ilk belirtisi, Kasım 2000 tarihinde bazı orta ölçekli bankaların likidite sıkışıklığı yaşaması olarak kendini göstermiştir. asım 2000 tarihinde, bankaların açık döviz pozisyonlarını kapama çabaları faiz oranlarında keskin artışlar yaratmıştır. rtan faiz oranları ile birlikte önemli ölçüde sermaye çıkışı yaşanmıştır. Merkez Bankası, istikrar programı şartlarını göz ardı ederek likidite problemi olan bankalara likidite sağlayarak krizin derinleşmesini ertelemiştir. Ancak, 19 Şubat 2001 tarihinde dönemin Başbakanının, Türkiye'nin ciddi siyasi kriz ile karşı karşıya olduğunu açıklaması, kırılgan olan mali sektörün parçalanmasına neden olmuştur. Siyasi kriz, Türkiye ekonomisini yıkıcı bir şekilde etkilemiş ve finansal krizin temel tetikleyicisi olmuştur. Bankacılık sektöründe baş gösteren mali krizin imalat sektörüne etkisi daha derin olmuştur. Krizin ilk üç ayında 4146 firma kapanmış, işsizlik oranı artan bir eğilim içerisine girmiş ve yatırımlar durma noktasına gelmiştir. ncak, derin daralmaya rağmen, Türkiye ekonomisi 2002-2007 yılları arasında yüksek oranlı büyümeler kaydederek krizin etkilerini bir miktar hafifletmiştir. 2001 krizi sonrasında yapılan reformlar ile bankacılık sektörü artık daha dayanıklı hale getirilmiştir. eniden uygulanmaya konulan istikrar programının disiplinli bir şekilde tatbik edilmesi, Türkiye ekonomisinin beklenenin üzerinde performans sergilemesine neden olmuştur. ürk ekonomisinin etkileyici ilerlemesi özellikle, doğrudan yabancı yatırım şeklinde önemli sermaye girişlerine neden olmuştur. ncak dünya ile artan ekonomik entegrasyon, Türkiye ekonomisini dünya piyasalarındaki gelişmelere daha duyarlı hale getirmiştir. Nitekim, 2008 yılında Amerika

Birleşik Devletlerinde emlak piyasalarında başlayan ve daha sonra finansal krize dönüşerek tüm dünyayı etkisi altına alan küresel kriz, Türkiye ekonomisini de derinden etkilemiştir. Küresel kriz ilk olarak ihracatçı sektörleri etkilemiş,daha sonra etkisi diğer sektörlere de yayılmıştır. 1994 ve 2001 krizlerinden farklı olarak 2008 krizi ile birlikte ilk kez ihracat önemli ölçüde olumsuz yönde etkilenmiştir.

Belirlenen bu üç farklı krizin ihracat davranışları üzerindeki etkisini incelerken son dönem uygulamalı yazında yapıldığı üzere krizlerin yayılma (extensive) ve yoğunluk (intensive) ticaret marjlarına etkileri ayrı ayrı incelenmiştir.

Yayılma ticaret marjı, ihracatçı firma sayısını ifade etmektedir. rizlerin yayılma ticaret marjı üzerindeki etkilerini görebilmek amacıyla ihracatçı olma olasılığı, kriz öncesi dönemde ihracatçı olan ve olmayan firmalar için ayrı ayrı incelenmiştir. onuçları özetleyecek olursak, ilk olarak 1994 ekonomik krizi gibi yüksek enflasyon, yüksek faiz oranları ve yüksek oranlı devalüasyonlarla kendini gösteren ekonomik çalkantılar, firmaların ihracat davranışlarında belirgin farklar yaratmamaktadır. Ancak, kriz ile birlikte düşen battı maliyetler daha kötü performansa sahip firmaların ihracatçı olmasına olanak sağlamaktadır. Buna karşın, halen, daha büyük, daha üretken ve daha az kredi kısıtı bulunan firmalar ihracatçı olmaktadırlar. Yüksek oranlı devalüasyonlar ihracat piyasalarına girmek için en önemli motivasyonu oluşturmaktadır.1994 kriz koşulları yayılma ticaret marjının artmasına neden olmuştur.

Öte yandan, 2001 krizi gibi kredi arzında önemli daralma yaşandığı durumlarda, firmaların ihracat kararlarında kredi kısıtı ön plana çıkmaktadır. Bu gibi durumlarda sadece dış finansman kaynağı bulabilen firmalar ihracatçı olabilmektedir. 2001 krizinde özellikle yüksek teknolojik ürünler üreten firmaların bankalarca kredi sınırlamasına (credit rationing) maruz kaldıkları gözlenmiştir. Bu durum, teknoloji yoğun sektörlerde faaliyet gösteren firmaların mali risklerinin bankalarca gerektiği gibi değerlendirilememesinden kaynaklanmaktadır. 2001 krizinde battı maliyetlerde istatistiksel olarak anlamlı bir değişim gözlenmemiştir. eğişmeyen battı maliyetlerle birlikte sıkılaşan kredi koşulları ihracatçı

sayısını olumsuz yönde etkilemiştir. u çerçevede 2001 krizi ile birlikte yayılma ticaret marjında bir miktar gerileme olduğu söylenebilir.

2008 krizinde olduğu gibi kredi sıkışıklığına ek olarak yurtdışı talepte ciddi daralma, firmaların ihracat kararlarında kredi kısıtı ve karlılığı ön plana çıkarmıştır. irmaların, dış finansman kaynaklarına ulaşması, gerek ihracatçı olma ihtimallerini gerekse ihracat piyasalarında sağ kalım olasılıklarını artırmaktadır. irmaların karlılıgı ise kriz öncesi ihracatçı olmayan ve olan firmaların ihracat kararlarını karşıt şekilde etkilemektedir. riz öncesi dönemde ihracatçı olan firmalardan daha karlı olanların, ihracat piyasalarında sağ kalma olasılıkları daha yüksek olmaktadır. Öte yandan, kriz öncesi dönemde ihracatçı olmayan firmalardan daha yüksek kara sahip olanların, ihracatçı olma olasılığı daha düşüktür. Bu sonuç gösteriyor ki; kredi koşullarındaki sıkılık ve yurtdışı piyasalara ilişkin belirsizlik sadece yurtiçine hizmet veren karlı firmaların ihracat piyasalarına girişini olumsuz yönde etkilemektedir. urtiçi karlılığından memnun olmayan firmalar ancak bu dönemde ihracatçı olmayı tercih etmektedir.

Yoğunluk ticaret marjı ise mevcut ihracatçıların yapmış oldukları ihracat cirosunu ifade etmektedir. rizlerin yoğunluk marjı üzerindeki etkisini incelemek amacıyla ihracat hacmi, Heckman örneklem seçimi yanlılığı düzeltmeli (Heckman selection bias correction) olarak tahmin edilmiştir.

İlk olarak, tahmin sonuçları, Heckman örneklem seçimi yanlılığının istatistiksel olarak anlamlı olduğuna işaret etmiştir. Bu düzeltmenin yapılmaması aşırı tahmin (overestimated) edilen katsayılara neden olmaktadır. Invmills ile kriz kukla değişkenleri etkileşim değişkenlerine ait katsayı tahminleri, 1994 ve 2008 krizlerinin örneklem seçim yanlılığında istatistiksel olarak anlamlı değişiklikler olduğunu göstermektedir. Buna göre, battı maliyetlerdeki değişimle tutarlı olacak şekilde, 1994 krizinde örneklem seçim yanlılığının azaldığı, 2008 krizinde ise arttığı gözlenmektedir.

Firma özelliklerinin ihracat hacmi üzerindeki etkisine bakıldığında, örneklem yanlılığı düzeltmesi yapıldıktan sonra, sektör, büyüklük, verimlilik, kalite ve finansal gücün firmaların ihracat miktar kararlarını etkilemektedir. ahmin sonuçları teknolojik gelişmişlik ile ihracat miktarı

arasında negatif bir ilişki olduğunu göstermektedir. özlemlenen bu negatif ilişki, Türk imalat firmalarının yüksek teknoloji gerektiren sektörlerde rekabet etme güçlüğüne işaret etmektedir. unun temel nedeni, Türkiye'nin düşük teknoloji sektörlerinde uzmanlaşmış olması ve bu ürünlerde göreceli üstünlüğe sahip olmasıdır. riz kuklaları ile sektör kuklalarının etkileşim değişkenlerine ait katsayı tahminleri, 1994 krizinin düşük teknoloji sektörleri dışında kalan tüm sektör firmalarını olumsuz yönde etkilediğini göstermektedir. Öte yandan, orta-yüksek teknoloji firmalarının 2001 krizinden, orta-düşük ve orta-yüksek teknoloji firmalarının ise 2008 krizinden olumlu yönde etkilendiği sonucuna varılmıştır.

Firma büyüklüğü ile ihracat hacmi arasında pozitif ilişki gözlenmektedir. riz kuklaları ile firma büyüklüğüne ait kukla değişkenlerin etkileşim katsayıları, 1994 krizinin özellikle mikro ölçekli firmaları, 2001 krizi ise büyük ölçekli firmaların ihracat hacmini artırıcı şekilde etkilemiştir. 2008 krizi ise özellikle küçük ölçekli firmaların ihracat hacimlerini olumsuz yönde etkilemiştir.

Üretkenlik, kredi kısıtı ve kalite ile ihracat hacmi arasında beklenildiği üzere pozitif bir ilişki mevcuttur. Daha üretken, daha az kredi kısıtı olan ve daha kalite odaklı üretim yapan firmaların ihracat hacmi de daha yüksek olmaktadır. Sermaye yoğunluğuna ait tahmin edilen katsayı ise istatistiksel olarak anlamlı ve negatiftir. egatif katsayı, Türk imalat sanayi firmalarının sermaye yoğun olan sektörlerde göreceli olarak dezavantajlı olduğunu göstermektedir.

Tablo 6.6'da verilen model tahmin sonuçları kullanılarak farklı büyüklük ve sektör gruplarında yer alan ortalama firmaların kriz dönemlerindeki ihracat hacimleri hesaplanmıştır. Bunlara ait sonuçlar Şekil 6.8-6.11'de verilmiştir. rizlerin yoğunluk marjı üzerinde yarattığı genel etki ise Şekil 6.12 ve 6.13'de betimlenmektedir. Sonuçlara göre; 1994 ve 2008 krizleri yoğunluk marjlarında düşüşe sebep olurken, 2001 krizi marjı artırmıştır.

Tahmin sonuçlarından elde edilen bilgiler ışığında, 1994 krizinde toplam ihracatta gözlenen yüzde 18'lik artışta, yayılma ticaret marjındaki artışın etkili olduğu, 2001 krizi ile birlikte yüzde 12.6 oranında artış gösteren toplam ihracatta ise yoğunluk ticaret marjının etkili olduğu

sonucuna ulaşılmıştır. 2008 krizi ile birlikte toplam ihracatta gözlenen önemli düşüş ise her iki ticaret marjında gözlenen düşüşe atfedilmiştir.

Bu tezin bulguları, bazı ticaret politika önerileri sağlamaktadır. İlk olarak, teknolojik gelişmişliğin ve sermaye yoğunluğunun ihracat hacmini negatif yönde etkilemesi, Türkiye'nin, düşük teknoloji sektörlerindeki göreceli avantajını göstermektedir. Ancak, 2008 krizinde, düşük teknoloji sektörlerinde faaliyet gösteren firmalar için ihracata devam etme olasılığının daha düşük olduğu görülmüştür. u gözlem, Türk imalat sanayi firmalarının uluslararası piyasalardaki göreceli avantajının son dönemde tehlike altında olduğuna işaret etmektedir. u nedenle, ihracat piyasalarındaki pozisyonunu koruyabilmek amacıyla Türk imalat sanayi firmaları ya ihraç ettikleri düşük teknoloji ürünlerin kalitesini artırmalı ya da daha teknoloji yoğun sektörlerde uzmanlaşmalıdırlar.

Tahmin sonuçları, genel olarak firma büyüklüğünün ihracat davranışı üzerinde etkili olduğunu göstermiştir. üçük ve orta ölçekli firmaların ihracat piyasalarına girişi ve buralarda sağ kalmalarına ilişkin olasılıklar oldukça düşüktür. una ek olarak, krizlerin etkileri incelenirken, üretken ve büyük firmalar krizin olumsuz etkilerini bertaraf edebilirken, bazı küçük ve orta ölçekli firmaların bu konuda başarılı olamadığı gözlenmiştir. ncak, küçük ve orta ölçekli firmaların önde gelen istihdam kaynakları olması nedeni ile Türkiye ekonomisinde önemli rolleri vardır. Bu çerçevede bakıldığında, küçük ve orta ölçekli ihracatçı firmaları destekleyen politikalar, Türkiye için kronik bir hal alan işsizlik problemini hafifletmekte yardımcı olacaktır.

Bu tezin ima ettiği bir başka sonuç ise kredi kısıtının ihracat davranışları üzerindeki etkisidir. ahmin sonuçları, dış finansman kaynaklarına ulaşabilirliği göstermek amacıyla oluşturulan kredi kısıtı değişkeninin, tüm modellerde istatistiksel olarak anlamlı olduğunu göstermektedir. Bu dış finansman kaynaklarının, firmaların ihracat kararlarında önemli role sahip olduğuna işaret etmektedir. Kredi kısıtı büyük, üretken ve karlı firmaların dahi ihracat davranışlarını etkilemektedir. u nedenle, firmaların ihracat piyasalarına girmelerini teşvik etmek amacıyla, ihracatçı firmaların sağ kalım oranlarını ve ihracat hacimlerini artırmak için finansman kaynaklarına ulaşımı kolaylaştırmak

gerekmektedir. ürkiye için alternatif finansman araçları iyi gelişmediği için bankacılık sektörü, dış finansman kaynaklarının temelini oluşturmaktadır. ankaların, firmalara kredi sağlayabilmesinin ön şartı, istikrarlı ekonomik koşullardır. stikrarsız ortamlarda bankalar, kendilerini garanti altına almak için sadece büyük, güvenilir firmalara kredi sağlama taraftarıdır. u nedenle, bankacılık sektörünün sağlıklı olması ve kredi sağlama konusunda istekli olması özellikle küçük ve orta ölçekli firmalar için büyük önem taşımaktadır. Her ne kadar 2001 krizi sonrası yapılan reformlar ile bankacılık sistemi güçlendirilmiş olsa da halen bankaların firmalara kredi sağlama konusunda tutucu oldukları gözlenmektedir. Bunun temel sebebi, bankaların halen firmaların kredi risklerini güvenilir bir şekilde ölçememesidir. ankaların bu konuda eğitilmesi ve bankacılık sektörü dışında alternatif finansman araçlarının geliştirilmesi, Türkiye ihracat performansını iyileştirecektir.

Parasal olmayan rekabet göstergesi olarak tanımlanan pazarlama,reklam ve dağıtım harcamalarının Türk imalat sanayi firmalarının ihracat davranışlarında önemli bir role sahip olduğu gözlenmiştir. Ayrıca, tahmin sonuçları, genel inanışın aksine, fiyat rekabeti sağladığı ve bu yüzden ihracat performansı için önemi her fırsatta vurgulanan döviz kurunun firmaların ihracat kararları üzerindeki etkisinin oldukça sınırlı olduğunu göstermektedir. u sonuçlar, değerli kur politikalarının sürdürülebilir ihracat büyümesi için yeterli olmadığını göstermektedir. Bunun yerine, firmaların, parasal olmayan, rekabet güçlerini artıracak yapısal değişimler içeren politikalar geliştirmesi daha etkin sonuçlar verecektir. Kalite rekabeti, pazarlama ve reklama yapılan yatırımlar ile artırılabilir. ünümüzde internet kullanımı gittikçe yaygınlaşmaktadır. nternet aracılığı ile yapılan pazarlama ve reklam aktiviteleri daha kolay yapılmakta ve daha hızlı sonuç vermektedir. u çerçevede bakıldığında, firmalar, internet açılımı ile elde edebilecekleri kazanımlar hakkında bilgilendirilmeli ve bilişim teknolojilerine yatırım yapmaları konusunda teşvik edilmelidirler.

Bu tezin mevcut yazına önemli birkaç katkısı olmuştur. İlk olarak; gittikçe gelişen ve büyüyen yazına, Türkiye verisi kullanarak katkıda bulunmuştur. Daha sonra, önceki çalışmalarda yapılanın aksine, bu tezde

ihracat davranışları farklı yönleri ile ele alınmıştır. yrıca, veri setinin ve Türkiye ekonomisinin avantajı kullanılarak farklı türdeki krizlerin, ihracat davranışları üzerindeki etkileri incelenmiştir. Elde edilen sonuçlar, şokların ihracat davranışları üzerindeki etkisini konu alan yazına katkı sağlamıştır.

Yapılan bu çalışma, Türk imalat sanayi firmalarının ihracat davranışlarını ve Türkiye'ye özgü farklı kriz tiplerinin ihracat performansı üzerindeki etkisini mikro çerçevede ele alması yönünde ilk adım olma niteliği taşımaktadır. irmaların ihracat davranışlarını daha iyi belirleyebilmek için kullanılan açıklayıcı değişkenlerde bazı değişiklikler yapılabilir. zellikle, firmaların yabancı sermayeli olup olmaması, birkaç farklı kanaldan fimaların ihracat davranışlarını etkileyebilmektedir. oğrudan yabancı yatırımların en önemli faydalarından birisi teknoloji transferi sağlamasıdır. Ayrıca, yabancı sermayeli şirketlerin gerek iç gerekse dış finansman olaranaklarının daha geniş olduğu bilinmektedir. Nitekim, yabancı sermayeli firmaların ihracat davranışları son dönemde uluslararası ticaret yazınında da yoğun ilgi görmektedir. evcut firmaların yabancı sermayeli olup olmadığına ilişkin verilerin derlenmesi ile birlikte, modellere değişkenin eklenmesi, yabancı mülkiyet, teknolojik yatırım ve ihracat ilişkisini firma bazında incelemeye olanak sağlayarak bu konuyla ilgili tartışmalara katkı sağlayacaktır. Daha ileri bir aşama olarak, TCMB Sektör Bilançoları veri setinde yer alan, hizmet sektöründe faaliyet gösteren firmaların verileri kullanılarak, mevcut çalışma, hizmet sektörü için tekrarlanabilir. Böylelikle, Türk imalat ve hizmet sektöründe faaliyet gösteren firmaların, ihracat davranışlarındaki benzerlikler ve farklılaşmalar ortaya konularak, Türkiye ihracat performansına ilişkin, zengin bir çalışma elde edilmiş olur.

APPENDIX F

Tez Fotokopisi İzin Formu

ENSTİTÜ

Fen Bilimleri Enstitüsü	
Sosyal Bilimler Enstitüsü	X
Uygulamalı Matematik Enstitüsü	
Enformatik Enstitüsü	
Deniz Bilimleri Enstitüsü	

YAZARIN

Soyadı : ATABEK DEMİRHAN
Adı : ASLIHAN
Bölümü : İKTİSAT

TEZİN ADI: EXPORT BEHAVIOR OF TURKISH MANUFACTURING FIRMS, 1989-2010 PERIOD.

TEZİN TÜRÜ	Yüksek Lisans		Doktora	X

1. Tezimin tamamından kaynak gösterilmek şartıyla fotokopi alınabilir.	
2. Tezimin içindekiler sayfası, özet, indeks sayfalarından ve/veya bir bölümünden kaynak gösterilmek şartıyla fotokopi alınabilir.	
3. Tezimden bir (1) yıl süreyle fotokopi alınamaz.	X

TEZİN KÜTÜPHANEYE TESLİM TARİHİ: