Effects of 2008 Global Economic Crisis on Manufacturing Companies Listed at Borsa Istanbul

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Abstract

Several researches have been conducted to examine the effects of the 2008 global economic crisis on economy in many countries. This article brings novelty to crisis literature as the effects were examined on micro basis, in other words, on 157 Turkish manufacturing firms listed on Bourse Istanbul between 2008 and 2011 on a quarterly basis. Panel data analysis was conducted to see effects of selected financial variables (net working capital/total assets, inventories/total assets, earnings before interest and tax/total assets, short-term financial debt /total assets and long-term financial debt/total assets) on firm financial performance (return on assets). The findings say that working capital and inventory management gained more importance during crisis time compared to pre-crisis period. The explanatory power of cash flows which are used to be main determinant of firm profitability before crisis is diminished during crisis period. The effect of financial debts on firm profitability was higher during crisis. It can be concluded that on general, leverage and liquidity management became more significant in crisis times compared to pre-crisis period and successful firms in these two aspects performed higher profitability during crisis time.

Keywords: *crisis, manufacturing companies, profitability, panel data analysis*

2008 Küresel Ekonomik Krizinin Borsa İstanbul'a Kote Olan İmalat Sanayi Şirketlerine Etkileri

Öz

2008 global ekonomik krizinin etkilerini görmek amacıyla birçok ülkede çok sayıda çalışma yapılmıştır. Bu çalışma, kriz etkilerinin mikro bazda diğer bir ifadeyle, Borsa İstanbul'da işlem gören 157 adet Türk imalat sanayi şirketinin 2008-2011 yılları arasında çeyrek bazda incelenmesi sebebiyle kriz literatürüne yenilik getirmiştir. Seçilmiş finansal değişkenlerin (net çalışma sermayesi/toplam aktifler, stoklar/toplam aktifler, faiz ve vergi öncesi faaliyet karı/toplam aktifler, kısa ve uzun vadeli finansal borç/toplam aktifler) firma performansına (aktif karlılığı) etkilerini görebilmek amacıyla panel veri analizi yapılmıştır. Bulgular, kriz döneminde işletme sermayesi ve stok yönetiminin karlılığa olan etkisinin kriz öncesine göre arttığını dolayısıyla daha da önem kazandığını göstermiştir. Kriz öncesinde şirket karlılığında en önemli unsur olan nakit girişlerinin açıklayıcı gücü kriz döneminde azalmıştır. Finansal borçların karlılık üzerindeki etkisi kriz döneminde büyümüştür. Genel sonuç olarak, kriz döneminde borç ve likidite yönetimi kriz öncesine göre daha da önem kazanmış ve bu konuda başarılı olan şirketler diğer şirketlere kıyasla kriz döneminde daha iyi bir performans sergilemişlerdir.

Anahtar Kelimeler: *kriz, üretim şirketleri, karlılık, panel veri analizi*

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1. Introduction

The global economic crisis initiated by subprime mortgage crisis in United States of America (USA) in August 2007 that spread out all over the world in 2008, is no doubt one of the most important economic events that the world has gone through. Its effects are compared to Great Depression of the 1930s. World trade volume which increased by 15,4% in 2008 recorded a significant contraction of 22,8% in 2009. This contraction is the largest decrease since World War II.

Central Banks injected huge amounts of liquidity to money markets and governments in the USA and Euro area seized many banks. The investment banking model has ended. Big banks and financial institutions announced big losses. Central Banks decreased policy interest rates to avoid credit crunch in the markets and governments announced special rescue packages to restore confidence in their economies. G-20 countries organized many meetings to work on a new financial system to be able to avoid such economic downturns in the near future. As economic and social aspects cannot be divided easily, many question marks have surged about the capitalism whether it is the right model for humanity.

These wide effects are the main reason that many researches have been conducted about this crisis on the global and country level. On the macro side, the numbers say that many countries had to face gross domestic product (GDP) contractions either in 2009 and/or in 2010 as a consequence of world trade decrease as seen in Table 1. This contraction has been felt much more on advanced economies than emerging and developing countries. The USA recorded consecutive GDP contractions in years 2008 and 2009 as the origin country of the crisis. Turkey, although being in the second group of least affected countries, is also affected because more than 50% of its foreign trade volüme is with the European Union (EU) as shown in Table 2 (Dombekci, 2014).

Table 1. GDP Growth Rates

	Average								
(% Annual Change)	**1994-2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
World real GDP	3,4	4,9	4,5	5,2	5,4	2,8	-0,6	5,3	3,9
Advanced Economies	2,8	3,1	2,6	3	2,8	0,0	-3,6	3,2	1,6
USA	3,3	3,5	3,1	2,7	1,9	-0,3	-3,5	3,0	1,7
Euro Area	2,2	2,2	1,7	3,3	3	0,4	-4,3	1,9	1,4
Emerging & Developing Economies	4,4	7,5	7,3	8,2	8,7	6	2,8	7,5	6,2
Central & Eastern Europe	3,4	7,3	5,9	6,4	5,4	3,2	-3,6	4,5	5,3
Turkey	2,7	9,4	8,4	6,9	4,7	0,7	-4,8	9	8,5

Source: World Economic Output April 2012, IMF

Table 2. Quarterly GDP Growth Rates of Turkey

Year (% Change)	**GDP (Annual)**	**Q1**	**Q2**	**Q3**	**Q4**
1999	**-3,4**	-5,4	-1,6	-4,8	-1,6
2001	**-5,7**	1,3	-6,3	-6,5	-9,8
2008	**0,7**	7,0	2,6	0,9	-7,0
2009	**-4,8**	-14,7	-7,8	-2,8	5,9
2010	**9,2**	12,6	10,4	5,3	9,3
2011	**8,5**	11,9	9,1	8,4	5,2

Source: Turkish Statistical Institute (TURKSTAT)

On the micro side, many studies that are shown on literature review section, have been also conducted. This article is unique as panel analyses are conducted to discover the effects of the crisis on the micro side of the Turkish economy contrary to several research which uses macro data of Turkey.

The paper is organized as follows. Section 2 covers previous research about crisis. Section 3 assesses results of the empirical analysis. Section 4 concludes.

2. Literature Review

Global crisis of 2008 originated first in the USA and many studies have been made since then. Most of the research conducted in different countries have studied effects of the crisis by using aggregate data. Now, many researches are on the way using firm-level data to understand real effects of the crisis.

2.1. Research Regarding Asian Crisis

The article written by Claessens, Djankov and Xu (2000) studied Asia crisis by taking Singapore, Malaysia, Indonesia, Thailand and Korea to their work. Their study is a very good example of pre and post-crisis analysis taking into account corporate performance. They compare return on assets (ROAs), ratio of debt to equity, long-term debt over total debt and maturity of debt structures of Asian countries to the USA, European and Latin American countries. Then, they look for the effects of country, industry affiliation, company characteristics such as current company size, sales margin, sales growth, ownership concentration, leverage ratio and short-term debt ratio before the crisis and the environment related to the protection of shareholders' rights and creditors' rights, in company sales margin after the crisis in 1998. The results show that well operating firms before crisis sustained their performance and were less affected by the crisis. In other words, pre-crisis operating problems (reflected with sales margins and sales growth) were found to be the major causes of financial pressures faced by the firms in 1998. This finding applies to both small and large firms. The performance of firms with higher leverage and a higher proportion of short-term debt was found to tend to be poorer compared to other firms without these characteristics.

Another study conducted by Hong, Lee and Lee (2007) analyzed the investment behavior of Korean firms before and after 1997 financial crisis in Asia. This study is especially chosen as it gives again an idea how to undertake pre-post analyses for the recent crisis. They use 400 listed firms in Korea Stock Exchange. The sample period is divided into two sub-periods such that before, 1994–1997 and after the financial crisis, 1998 - 2001. They set investment ratio as their dependent variable and 1-year lagged Tobin's q (market value of equity / book value of equity), 1-year lagged cash flow and industry effects as their independent variables. Before crisis, Korean firms were suffering of excessive investment, high leverage and low profitability. They find that both Korean conglomerates ('chaebol')-affiliated firms and non-chaebols lowered their investment ratios dramatically after the crisis. The two sub-groups of firms' investment ratio have become approximately the same. There was a significant difference before the crisis resulting in an over investment problem by chaebols. The debt/asset ratio in both groups decreased significantly after the crisis. The investment reduction was more pronounced in chaebol firms who had a higher debt/asset ratio prior to the crisis.

Kim and Stone (1999) evaluate the relationship between corporate leverage level of countries and their output adjustment when countries face a liquidity shock. In that case, companies cut first dividends then their investments and sell their physical assets at a discount to pay back their debts. If these actions are not sufficient to cover their obligations, they go bankrupt and sell their capital this time at a larger discount. In the low-debt case, firms do not sell their assets thus there are no bankruptcies even with a liquidity shock. In the medium-debt case, corporate leverage is high enough that firms have to decrease their investments, sell their physical assets with capital inflows cutoff to the country. Bankruptcies can be prevented by precautionary measures. These actions decrease output. In the high-debt case, some firms even go bankrupt besides elimination of investments and their capital assets are liquidated at a very larger discount. This time, output contraction is larger. Their model provides evidence that a corporate sector with high leverage can increase the impact of a credit cutoff on the real economy. This explains, in a sense, the case of highly leveraged Asian companies

in 1997. This study again underlines the fact that micro data can reveal many details corresponding to macro information.

Davis and Stone (2004) underline that how corporate financial structure is an important factor of determining real economy performance after a financial crisis (banking and currency crisis). Companies finance their investment and their inventories through internal funds first, then in order through bank lending, equity issuance and bond issuance. This order of corporate financing is corresponding to the development stage of a country's financial system. The empirical analyses conducted reveal that declines in inventory and investment are among the main contributors of post-crisis GDP contraction, so does corporate leverage. Financial crises affect much more corporate sectors in emerging markets than in industrial countries. This is a natural consequence due to the fact that industrial countries possess a developed financial system with multiple channels of corporate financing compared to the less developed financial system of emerging countries. According to researchers, overall economic stability indicators should also watch corporate sector's balance sheets to be able to foresee economic fragilities.

In another study, Stone (2000) also finds out that crisis-induced output contractions are driven by high levels of corporate debt, openness, and exchange rate over-appreciation.

Pomerleano (1999) analyzes the performance of Asian firms and compares them to firms of Latin America and developed countries. This analysis indicates that Asian firms made excessive investment expenditures which caused excessive leverage decreasing their profitability, return on equity and return on capital employed (and also Economic Value Added). As seen in several articles, the concept of leverage is very important. That's why short and long term leverage of Turkish companies before crisis and in crisis will be scrutinized.

Benmelech and Dvir (2011) focus on the importance of short-term debt in financial crises by studying data belonging to Asian crisis. Most people believe that the short-term debt increases fragility of firms due to roll-over difficulties during crisis times. Their empirical analysis shows that short-term debt does not cause financial crises instead it is a sign of financial weaknesses and acts as a early warning system. In the recent 2008 crisis, the ratio of short-term debt is again very high and it can be stated that it is an indicator of financial vulnerability of firms.

Mulder, Perrelli and Rocha (2002) study how corporate financials can warn for a crisis and give some clues about its depth. Variables that reflect financial leverage levels, maturity structure of debt, liquidity availability and profitability ratios and its cash flow generating capacity are used in their empirical research for Mexican, Asian and Russian crises. Among them, a high leverage ratio and a high ratio of short-term debt to working capital are key indicators of crisis vulnerability. If the magnitude of credits given to firms by banking system is high then impact of these two corporate ratios become more powerful in relation to crisis depth.

2.2. Research Regarding 2008 Global Crisis

Claessens, Tong and Wei (2011) examine channels by which the effects of 2007 global crisis have been transmitted to the firms. They use three channels (independent variables): external financing conditions, international trade and domestic demand channels. The three main issues investigated are as follows: 1) Are firms that were more dependent on external financing prior to the crisis more affected by the global crisis and 2) Are these firms perform differently during the crisis based on their sensitivity level to demand or 3) to trade shocks. Their data was consisted of 7.722 manufacturing firms from 42 countries. The empirical strategy here is to check whether before crisis classifications of firms in terms of their characteristics – degree of their financial dependence, demand sensitivity and exposure to trade - help to explain changes in their performance following the crisis. Sector and firm level indices are both constructed to find out elasticity of these three channels. To analyze firm performance, they take changes from 2007 to 2008/2009 in ratios of profits/assets, sales/assets and investments/sales as dependent variables. They find that firm level profits are more affected in sectors that are more sensitive to demand shocks. This result underlines that there was a significant global demand shock during the crisis. The impact of crisis on profits is also more pronounced for trade-sensitive sectors. This finding is

consistent with decrease in global trade during crisis. Similar to profit, sales declined significantly for those sectors more sensitive to demand and trade. Sales over assets also decreased significantly for those sectors with greater needs for working capital. This result suggests that working capital problems due to the global crisis reduced firm-level sales. No significant relationships are found related to capital investment. Same analyses are conducted with firm-level indices. However, sector level findings are more reliable compared to firm level results as the latter has some endogeneity problems like firms with lower profitability have to obtain more external financing.

Duchin, Ozbas and Sensoy (2010) also examine the effects of internal and external finance availability on investment with firm-level data for the period July 1, 2006–June 30, 2008. Their base regression takes investment before and after crisis as dependent variable and cash holdings, net debt, external financing constraints and dependence on external finance as independent variables. The results underline that post-crisis investment of financially constrained firms declined significantly thus is higher the impact of internal resources (previous year) for this type of firms. The post-crisis decline in investment is particularly severe for firms in industries that are historically more dependent on external finance or external equity finance (Rajan and Zingales, 1998). These firms' post-crisis investment was also been strongly affected by their cash reserves. Meanwhile, net short-term debt has a negative relationship with post-crisis changes in investment contrary to long-term debt. They grouped firms into high-cash (top quintile) and low-cash (bottom quintile) portfolios based on their cash balances. With the precautionary savings role, high-cash firms recorded abnormal returns in their stock prices compared to low-cash firms by the end of 2007. It is seen that financial liquidity increases value of investment during the crisis.

Tong and Wei (2009) perform an empirical analysis with 3.823 firms in 24 emerging countries if the manufacturing firms had to face some degree of liquidity constraint and how this effect was reflected in post-crisis stock price changes during 2007-2009 crisis. This liquidity constraint is caused by contraction in capital inflows (foreign portfolio flows, foreign loans and foreign direct investments (FDIs)). Firms need external finance either for long-term investment and/or working capital. They find that stock price decreases more when firms are more dependent on external finance for working capital than for investment. Leveraged firms have to face higher declines in their stock price during crisis. Emerging economies that have a higher pre-crisis exposure to foreign portfolio investments and foreign loans have more severe liquidity shocks compared to countries that have a higher pre-crisis exposure to FDIs.

2.3. Research about Effects of Crises on Turkish Companies

Büyükşalvarcı and Abdioğlu (2010) focus on factors that determine working capital requirement (WCR) of Turkish manufacturing firms listed on Istanbul Stock Exchange (ISE) during 2002-2006. Then, they divide the sample into two periods: pre-crisis period (2005-2007) and crisis period (2008-2009) and undertake the same research. The variables chosen are leverage ratio, ROA, ROE, EBITDA margin, net sales growth, inventory and receivables turnover, gross and net profit margins, fixed assets ratio, tobin's q and log of firm market value. The model shows that both leverage ratio and fixed assets ratio have a negative relationship with WCR in all periods, ROA only in the second year of crisis period, inventory turnover and tobin's q in crisis period and receivable turnover in the pre-crisis period respectively. In other words, firms that can increase their external finance resources make long-term investments and increase their asset usage effectiveness, will need less WCR.

Karaca and Çiğdem (2013) conduct an empirical analysis with 135 firms' quarterly financial ratios between 1991 and 2011 to discover the effects of 1994, 2001 and 2008 crises on manufacturing companies. They used factor analysis such that three factors are determined by grouping 15 financial ratios. Factor 1 is named as productivity factor as it includes turnover rates such as asset turnover, inventories turnover, receivables turnover etc. Factor 2 is named risk factor as it encompasses liquidity ratios. Factor 3 is called profitability factor as it takes into account profitability ratios. Then, they conduct a discriminant analysis to find out which factors affect more the selected firms during pre-crisis and post-crisis periods. Profitability factor is the most important factor for 1994

and 2001 crises whereas risk factor is the most significant one for 2008 crisis.

Korkmaz and Karaca (2014) study twelve financial ratios of 78 firms from the manufacturing industry between 2000 and 2011 to understand their profitability structure by conducting panel analysis. They determine earnings per share, ROE and ROA as dependent variables in their model. The results are found as follows: as total debt increases, their earnings per share and ROE decrease, the increase in assets increases ROE, and finally as the total debt increases, ROA decreases.

2.4. Other Relevant Studies Concerning Corporate Policies

Stone and Weeks (2001) looked for major factors of output contractions and found that the degree of cut-off of private capital inflows, corporate balance sheet indicators, imports to GDP and financial breadth were the main contributors.

In their estimate of a monthly "early warning system" Perrelli, Rocha and Mulder (1986) conclude that the corporate leveraged financing, short-term debt to working capital and shareholders rights are major indicators of a future crisis.

Opler and Titman (1994) analyze the relationship between financial distress and corporate performance. The analysis indicates that highly leveraged firms' sales drop more severely compared to less leveraged firms and their equity value declines are greater during economic downturns. Smaller firms' sales are much more affected than large firms' sales however the decline in their market value of equity is less than the average decline experienced by large firms during economic distress. In addition, leveraged firms invest less and their employment grows slowly compared to less leveraged firms.

Cleary (1999) focus on investment sensitivity of financially constrained and unconstrained firms to liquidity distress. The findings state that firm investment decisions are sensitive to internal funds rather than debts. And more interestingly, investment expenditures of financially unconstrained firms are more sensitive to the availability of liquidity than those of financially constrained firms. This is probably related to creditworthiness of firms.

3. Empirical Research

In the light of the research mentioned in the previous section, an empirical analysis is conducted for Turkish firms to see the real effects of the global crisis. (Dombekci, 2012)

3.1. Data and Sample Selection

In this study, financial data of 176 manufacturing firms listed on the Borsa Istanbul has been collected between 2006Q1 and 2011Q3. Nineteen firms are excluded from this list because either their financial statements are not announced as they have gone into financial distress or they are delisted or merged with other firms. The final data includes 157 listed manufacturing firms as shown in Appendix 1. The quarterly financial statements' data are obtained via FINNET. These financial statements are prepared according to International Financial Reporting Standards (IFRS). The data is also checked with the balance sheets and income statements obtained from Borsa Istanbul. The abbreviations for financial figures and the definitions of financial ratios used in this study are listed in Appendix 2 and Table 3.

Table 3. Financial Ratios Used in the Study

	FINANCIAL RATIOS	
1	EBITTA	ebit / total assets
2	EBITDATA	ebitda / total assets
3	NWCTA	net working capital / total assets
4	InvTA	Inventories / total assets
5	InvTURN	cost of goods sold / average inventory
6	RecTURN	net sales / average receivables
7	ASSETTURN	net sales / average total assets
8	CURRENT RATIO	current assets / current liabilities
9	FIX ASSETSTA	fixed assets / total ssets
10	CAPEXTA	capital expenditures / total assets
11	CashholdTA	cash holdings / total assets
12	SHETA	total shareholders' equity / total assets
13	OPERPROFITMARG	operating profit / net sales
14	NETINCMARG	net income / net sales
15	ROA	net income / total assets
16	ROE	net income / shareholders' equity
17	ROS	net income / net sales
18	TOTDEBTTA	total debt / total assets
19	stfideTA	short-term financial debt / total assets
20	ltfideTA	long-term financial debt / total assets
21	Tot debt burden	interest expenditures + short-term liabilities / net sales
22	Int debt burden	interest expenditures / net sales
23	Interest ExpTA	interest expenditures / total assets
24	ROIC	return on invested capital (EBIT/Invested capital)

3.2. Determination of Pre-Crisis and Crisis Periods

To discover the crisis effects will be easier when the data is divided into two subgroups: pre-crisis period (2006Q1-2008Q3) and crisis period (2008Q4-2011Q3). This division is made according to the results of Emerging Markets-Financial Stress Index, Financial Pressure Index and the macroeconomic parameters like industrial production index, capacity usage (beginning of contraction in September 2008), employment rate and GDP contraction (first contraction of 7% in 2008Q4).

When the search of an official announcement by Central Bank of Republic of Turkey (CBRT) is conducted to find out a date for the start of the crisis in Turkish economy, the results focus on some points:

- First, the CBTR announced that they decided to make their first overnight borrowing rate cut in November 19, 2008 to attenuate the slowing of economic activities (Başçı, 2008). This can be assumed as the official beginning of the global crisis in Turkey. The FED made its first rate cut in August 2007 to avoid credit crunch risk in the USA where this month is used by many researchers as the beginning of crisis. Furthermore, in almost all the reports of CBRT, the beginning of the global crisis in the world was accepted as August 2007 (CBRT, 2008).

- Second, in a report published in July 2009 by CBRT, the beginning of the global crisis in Turkey was indicated as July 2008 where the first monthly drop of industrial production index occurred. The end of the crisis was set again according to the same parameter as April 2009 (Yükseler, 2009). This report's suggestions are limited from the end date perspective as the report can only use data belonging to 2007, 2008 and 2009.

3.3. Crisis Effects on the Aggregate Financial Ratios of Firms

When main financial ratios of pre-crisis period with those of crisis period are compared in Table 4, the results are as follows;

Table 4. Descriptive Statistics (Pre-crisis & Crisis)

PRE-CRISIS							CRISIS						
Variable	Obs	Mean	Median	Std. Dev.	Min	Max	Variable	Obs	Mean	Median	Std. Dev.	Min	Max
EBITTA	1571	0,068	0,060	0,123	-2,812	0,688	EBITTA	1881	0,071	0,050	0,105	-0,433	1,755
EBITDATA	1571	0,093	0,080	0,125	-2,777	0,704	EBITDATA	1881	0,094	0,070	0,109	-0,423	1,781
NWCTA	1727	0,164	0,180	0,264	-2,167	0,739	NWCTA	1880	0,115	0,160	0,418	-4,419	0,771
InvTA	1727	0,174	0,149	0,119	0,000	0,715	InvTA	1880	0,154	0,130	0,119	0,000	0,746
InvTURN	1571	7,037	2,840	65,112	0,000	2489,348	InvTURN	1867	6,299	2,780	26,253	0,000	788,923
RecTURN	1567	30,097	3,300	232,399	0,000	5633,618	RecTURN	1880	4,098	2,640	6,128	0,000	109,984
ASSETTURN	1570	0,675	0,560	0,642	0,000	10,276	ASSETTURN	1881	0,560	0,470	0,449	0,000	5,008
CURRENTRATIO	1727	5,078	1,620	116,712	0,100	4851,481	CURRENTRATIO	1880	2,320	1,530	3,681	0,019	79,250
FIXASSETSTA	1727	0,375	0,370	0,180	0,000	0,911	FIXASSETSTA	1880	0,363	0,370	0,185	0,000	0,950
CAPEXTA	1570	0,005	0,000	0,064	-0,716	0,932	CAPEXTA	1881	0,002	-0,002	0,066	-1,872	0,491
CashholdTA	1727	0,067	0,040	0,082	0,000	0,498	CashholdTA	1880	0,080	0,040	0,096	0,000	0,613
SHETA	1727	0,505	0,580	0,396	-3,438	0,986	SHETA	1880	0,456	0,530	0,579	-9,573	0,995
OPERPROFITMARG	1723	0,125	0,070	1,664	-10,040	47,778	OPERPROFMARG	1871	0,536	0,050	29,613	-261,267	951,769
NETINCMARG	1723	0,035	0,030	2,115	-45,778	50,709	NETINCMARG	1871	0,002	0,030	25,019	-262,585	785,641
ROA	1570	0,020	0,021	0,131	-3,245	0,637	ROA	1881	0,007	0,012	0,131	-3,710	0,981
ROE	1570	-0,100	0,047	6,390	-249,740	30,810	ROE	1881	-0,028	0,024	0,611	-15,031	5,184
ROS	1723	0,035	0,030	2,115	-45,778	50,709	ROS	1871	0,002	0,030	25,019	-262,585	785,641
TOTDEBTTA	1727	0,495	0,420	0,396	0,014	4,438	TOTDEBTTA	1880	0,544	0,470	0,579	0,005	10,573
stfideTA	1727	0,104	0,058	0,130	0,000	1,160	stfideTA	1880	0,156	0,108	0,199	0,000	2,233
ltfideTA	1727	0,098	0,037	0,213	0,000	2,893	ltfideTA	1871	0,111	0,033	0,298	0,000	5,892
Tot debt burden	1723	1,341	0,640	6,319	0,006	240,510	Tot debt burden	1871	12,924	0,760	169,867	0,089	4759,458
Int debt burden	1723	0,095	0,038	0,241	0,000	4,623	Int debt burden	1871	1,081	0,079	15,711	0,000	473,078
Int ExpTA	1570	0,038	0,022	0,055	0,000	0,761	Int ExpTA	1881	0,059	0,035	0,119	0,000	3,728

The extreme maximum and minimum values exist in both periods. This is the sign that there are problematic or marginal firms in both pre-crisis and crisis periods. These firms are traded on Secondary National and Watch-list Companies Markets due to their financial and operational problems. They are not suppressed as outliers because they too exist and are assumed to belong to the sample of 157 firms listed on Borsa Istanbul.

3.4. The Methodology

The main aim is to analyze effects of the crisis on Turkish manufacturing firms. Many trials are conducted to reach a meaningful model. ROE, ROS and ROA are put into model as dependent variable. Financial items and ratios listed in Table 5 indicating liquidity and leverage position of a firm are put into model either in level or in ratios as independent variables. After these trials, the model including ROA (The ratio of net income to average total assets) as dependent variable and NWCTA (The ratio of net working capital to total assets), InvTA (The ratio of inventories to total assets), EBITTA (The ratio of earnings before interest and tax to total assets), stfideTA (The ratio of short-term financial debt to total assets) and ltfideTA (The ratio of long-term financial debt to total assets) as independent variables is chosen as the final model. The model uses 3.607 firm-quarter observations. All of these results are obtained by using STATA version 12[1] (STATA, Şirin, Woolridge and UCLA Resources; 2012).

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http://www.sscnet.ucla.edu/soc/faculty/emigh/lecture14.pdf,

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http://www.sscnet.ucla.edu/soc/faculty/emigh/lecture16.pdf,

http://www.sscnet.ucla.edu/soc/faculty/emigh/lecture17.pdf.

Jeffrey M. Woolridge, Rudiments of STATA. http://ebookbrowse.com/stata-wooldridge-pdf-d54094074.

Table 5. Correlation Matrix

	ROA	NWCTA	InvTA	EBITTA	stfideTA	ltfideTA
ROA	1,0000					
NWCTA	0,4802	1,0000				
InvTA	-0,0482	0,1929	1,0000			
EBITTA	0,7020	0,1774	-0,0658	1,0000		
stfideTA	-0,3796	-0,6868	0,1164	-0,0348	1,0000	
ltfideTA	-0,4055	-0,3823	-0,0656	0,0444	0,3104	1,0000

3.4.1. Panel Data Assumptions

There are four main assumptions to reach a statistically sound model.

1. The error term *u* is a random variable with mean or expected value of zero, that is *E(u)*=0.

2. The variance of *u* is denoted by σ^2 and is the same for all values of the independent variables.

3. The values of *u* are independent.

4. The error term *u* is a normally distributed random variable.

There can be some problems in relation to data that confront these assumptions. These are multicollinearity, autocorrelation and heteroskedasticity problems. Multicollineraity refers to correlation among the independent variables. It is a potential problem when the absolute value of the sample correlation coefficient exceeds 0,70 for any two of the independent variables (Anderson, Sweeney and Williams, 1996). The data includes both time-series data and cross sectional data of many firms. Autocorrelation is associated with time-series data and heteroskedasticity with cross-sectional data (Gujarati, 2006). When the correlation matrix is calculated for the model, no multicollinearity problem exists as indicated in Table 5.

3.4.2. Fixed Effects (FE) and Random Effects (RE)

As the sample data includes both time-series and cross sectional data of many firms, use of panel data will be much more informative for a researcher. While conducting this analysis, two techniques as fixed-effects (FE) and random effects (RE) are used.

FE explores the relationship between predictor and outcome variables within an entity (country, person, company, etc.). Each entity has its own individual characteristics that may or may not influence the predictor variables (for example being a male or female could influence the opinion toward certain issue or the political system of a particular country could have some effect on trade or GDP or the business practices of a company may influence its stock price). When using FE, the assumption is that something within the individual may impact or bias the predictor or outcome variables and it is necessary to control for this. This is the rationale behind the assumption of the correlation between entity's error term and predictor variables. FE removes the effect of those time-invariant characteristics from the predictor variables so the predictors' net effect can be assessed.

Another important assumption of the FE model is that those time-invariant characteristics are unique to the individual and should not be correlated with other individual characteristics. Each entity is different therefore the entity's error term and the constant term (which captures individual characteristics) should not be correlated with the others. If the error terms are correlated then FE is not suitable since inferences may not be correct and the relationship should be modeled probably using RE.

Whereas the rationale behind RE model is that, unlike the FE model, the variation across entities is assumed to be random and uncorrelated with the independent variables included in the model. If differences across entities have some influence on the dependent variable then RE should be used. In summary, FE technique assumes that coefficients of independent variables change according to entities (person, company etc.) and/or time. However, RE technique assumes that these change effects are included in the model via error terms. The decision which technique should be adopted is taken via Hausman test (Reyna, 2012).

After calculating FE and RE of the chosen panel model, it is necessary to apply Hausman test statistic to be able to decide on the right model. Hausman test uses a null hypothesis that lies on RE model. If the Prob>chi2 value is smaller than 0,05 and the test statistic chi-square is big enough then the null hypothesis is rejected and FE model should be used.

The results indicate that FE should be used to estimate coefficients of the chosen model for the whole sample period, pre-crisis and crisis periods. The autocorrelation and heteroskedasticity problems should also be checked on the panel data. For this, Breusch-Pagan LM test of independence is conducted and null hypothesis is rejected which means that the error terms of cross sections are correlated (chi2(12246) = 50799.136, P = 0.0000). There is also need to check for the autocorrelation problem for time series data. Wooldridge test for autocorrelation in panel data is made and again null hypothesis is rejected which means that there is autocorrelation on a panel data basis (F(1,156) = 85.990 and P = 0.0000). To find any evidence on the heteroskedasticity, Modified Wald test for groupwise heteroskedasticity in FE regression model is conducted and the result shows that the null hypothesis is rejected meaning that the model is not in line with constant variance assumption (chi2 (157) = 2.7 , P = 0.0000). Same tests are used for the pre-crisis and crisis periods. Since autocorrelation and heteroskedasticity exist for all periods, Generalized Least Squares (GLS) estimation procedure is used to estimate the equations instead of FE.

3.5. Empirical Results

The selected financial figures of sample firms are analyzed to find out main factors affecting firm performance and employment decisions of firms.

3.5.1. Firm Profitability with Respect to Crisis

In Table 6 ProfitabilityDum is a dummy variable taking the value of 1 if the firm records positive net income for a quarter and 0 if it announces a quarterly net loss. This analysis will help to understand the general situation of profitable and unprofitable firms. Thus, firms will be more prudent with their decisions before and during an economic crisis.

Table 6. Descriptive Statistics According to Firm Profitability (Pre-crisis & Crisis)

	ProfitabilityDum	=	0					ProfitabilityDum	=	1				
	Variable	Obs	Mean	Median	Std. Dev.	Min	Max	Variable	Obs	Mean	Median	Std. Dev.	Min	Max
PRE-CRISIS	EBITTA	520	-0,01	0,00	0,15	-2,81	0,32	EBITTA	1051	0,11	0,09	0,08	-0,03	0,69
	EBITDATA	520	0,02	0,03	0,15	-2,78	0,34	EBITDATA	1051	0,13	0,11	0,09	0,00	0,70
	NWCTA	579	0,03	0,10	0,34	-2,17	0,66	NWCTA	1148	0,23	0,21	0,18	-1,02	0,74
	InvTA	579	0,19	0,16	0,13	0,00	0,68	InvTA	1148	0,17	0,14	0,11	0,00	0,71
	InvTURN	519	3,69	2,10	6,47	0,00	87,01	InvTURN	1052	8,69	3,20	79,40	0,00	2489,35
	RecTURN	519	12,60	2,43	72,67	0,00	1250,297	RecTURN	1048	38,76	3,66	279,18	0,00	5633,62
	ASSETTURN	519	0,49	0,44	0,33	0,00	1,84	ASSETTURN	1051	0,77	0,62	0,73	0,00	10,28
	CURRENTRATIO	579	1,69	1,22	2,06	0,10	25,13	CURRENTRATIO	1148	6,79	1,78	143,13	0,22	4851,48
	FIXASSETSTA	579	0,40	0,40	0,20	0,00	0,91	FIXASSETSTA	1148	0,36	0,36	0,17	0,00	0,82
	CAPEXTA	519	0,00	0,00	0,08	-0,60	0,93	CAPEXTA	1051	0,01	0,00	0,05	-0,72	0,78
	CashholdTA	579	0,04	0,01	0,06	0,00	0,50	CashholdTA	1148	0,08	0,05	0,09	0,00	0,50
	SHETA	579	0,33	0,40	0,51	-3,00	0,97	SHETA	1148	0,60	0,63	0,28	-3,44	0,99
	OPERPROFITMARG	576	-0,13	-0,03	0,59	-10,04	1,11	OPERPROFITMARG	1147	0,25	0,11	1,98	-0,25	47,78
	NETINCMARG	576	-0,35	-0,10	2,00	-45,78	0,00	NETINCMARG	1147	0,23	0,07	2,14	0,00	50,71
	ROA	519	-0,07	-0,04	0,17	-3,24	0,00	ROA	1051	0,07	0,05	0,07	0,00	0,64
	ROE	519	-0,50	-0,06	11,11	-249,74	30,81	ROE	1051	0,10	0,08	0,13	-1,58	1,36
	ROS	576	-0,35	-0,10	2,00	-45,78	0,00	ROS	1147	0,23	0,07	2,14	0,00	50,71
	TOTDEBTTA	579	0,67	0,60	0,51	0,03	3,99	TOTDEBTTA	1148	0,40	0,37	0,28	0,01	4,44
	stfideTA	579	0,15	0,12	0,16	0,00	1,16	stfideTA	1148	0,08	0,05	0,10	0,00	0,56
	ltfideTA	579	0,15	0,07	0,28	0,00	2,67	ltfideTA	1148	0,07	0,02	0,16	0,00	2,89
	Tot debt burden	576	2,53	1,13	10,61	0,04	240,51	Tot debt burden	1147	0,74	0,47	1,57	0,01	46,00
	Int debt burden	576	0,18	0,11	0,29	0,00	3,42	Int debt burden	1147	0,05	0,02	0,20	0,00	4,62
	Int ExpTA	519	0,07	0,05	0,08	0,00	0,76	Int ExpTA	1051	0,02	0,02	0,03	0,00	0,23
	ProfitabilityDum	=	0					ProfitabilityDum	=	1				
	Variable	Obs	Mean	Median	Std. Dev.	Min	Max	Variable	Obs	Mean	Median	Std. Dev.	Min	Max
CRISIS	EBITTA	722	0,01	0,00	0,07	-0,43	0,55	EBITTA	1159	0,11	0,09	0,10	-0,04	1,76
	EBITDATA	722	0,03	0,02	0,08	-0,42	0,59	EBITDATA	1159	0,13	0,11	0,11	-0,03	1,78
	NWCTA	721	-0,05	0,05	0,59	-4,42	0,67	NWCTA	1159	0,22	0,21	0,21	-1,14	0,77
	InvTA	721	0,17	0,13	0,14	0,00	0,75	InvTA	1159	0,15	0,13	0,10	0,00	0,68
	InvTURN	713	4,61	2,21	9,40	0,00	107,27	InvTURN	1154	7,34	3,05	32,53	0,00	788,92
	RecTURN	721	4,08	2,22	7,13	0,00	81,20	RecTURN	1159	4,11	2,80	5,42	0,00	109,98
	ASSETTURN	722	0,45	0,35	0,40	0,00	2,46	ASSETTURN	1159	0,62	0,53	0,47	0,00	5,01
	CURRENTRATIO	721	1,85	1,13	4,65	0,02	79,25	CURRENTRATIO	1159	2,61	1,77	2,89	0,11	39,54
	FIXASSETSTA	721	0,40	0,39	0,21	0,00	0,95	FIXASSETSTA	1159	0,34	0,36	0,16	0,00	0,88
	CAPEXTA	722	0,00	0,00	0,09	-1,87	0,49	CAPEXTA	1159	0,00	0,00	0,04	-0,74	0,46
	CashholdTA	721	0,05	0,02	0,07	0,00	0,41	CashholdTA	1159	0,10	0,07	0,10	0,00	0,61
	SHETA	721	0,27	0,41	0,82	-9,57	0,99	SHETA	1159	0,57	0,60	0,29	-3,50	0,99
	OPERPROFITMARG	713	-1,20	-0,05	14,68	-261,27	96,84	OPERPROFITMARG	1158	1,61	0,09	35,80	-2,21	951,77
	NETINCMARG	713	-2,14	-0,10	17,77	-262,59	0,00	NETINCMARG	1158	1,32	0,07	28,51	0,00	785,64
	ROA	722	-0,07	-0,03	0,17	-3,71	0,00	ROA	1159	0,05	0,04	0,07	0,00	0,98
	ROE	722	-0,19	-0,06	0,86	-15,03	5,14	ROE	1159	0,07	0,06	0,34	-6,44	5,18
	ROS	713	-2,14	-0,10	17,77	-262,59	0,00	ROS	1158	1,32	0,07	28,51	0,00	785,64
	TOTDEBTTA	721	0,73	0,59	0,82	0,01	10,57	TOTDEBTTA	1159	0,43	0,40	0,29	0,01	4,50
	stfideTA	721	0,22	0,16	0,27	0,00	2,23	stfideTA	1159	0,12	0,08	0,12	0,00	1,02
	ltfideTA	721	0,16	0,04	0,43	0,00	5,89	ltfideTA	1159	0,08	0,03	0,16	0,00	2,71
	Tot debt burden	713	24,24	1,22	228,24	0,14	4759,46	Tot debt burden	1158	5,96	0,59	120,22	0,09	3029,46
	Int debt burden	713	1,87	0,13	20,31	0,00	473,08	Int debt burden	1158	0,60	0,06	12,02	0,00	301,85
	Int ExpTA	722	0,08	0,04	0,18	0,00	3,73	Int ExpTA	1159	0,05	0,03	0,06	0,00	0,77

When liquidity ratios like NWCTA, CURRENTRATIO and CashholdTA are taken into account, it is seen that the profitable companies are much more liquid than the unprofitable companies in the pre-crisis period due to their cash holding ratio. They use less short-term debt thus have to bear less interest expenditures. The mean values of the same liquidity ratios of the pre-crisis and crisis periods show that average NWCTA has a negative sign in the crisis period for unprofitable firms because short-term financial debt burden is higher than pre-crisis period whereas the cash holding behavior does not show much difference.

Pre-crisis and crisis average CURRENTRATIO and CashholdTA ratios look similar for firms recording losses in their balance sheets. In the crisis period, average NWCTA ratio of profitable firms which is 0,217 is close to the ratio in the pre-crisis period that is 0,233. The mean CURRENTRATIO variable of profitable firms decreased from 6,79 to 2,61 in the crisis period due to significant increase in current liabilities. For the same firms in crisis, CashholdTA ratio (0,101) is on average 100% larger compared to unprofitable firms (0,046). Crisis cash holding ratio (0,101) is also larger than pre-crisis cash holding ratio (0,083) for profitable firms. When the comparisons are made from the perspective of internal resources usage (equity), profitable firms financed around 60% of their assets by their equity on average. Unprofitable firms' stfideTA and ltfideTA ratios are on average two fold of those of profitable firms. The average TOTDEBTTA ratio is around 70% for unprofitable firms thus only 30% of assets are financed by equity on average.

To summarize, profitable firms are more liquid, hold more cash, use more equity thus less debt than unprofitable firms. As firms record profits, they tend to hold more cash and also to reserve more cash as they face economic downturns. The financial indicators underline the fact that the essentials to operate a business profitably do not change much whether there is a crisis or not. The optimal usage of internal and external resources of a firm is the distinctive mark to record profits.

Table 7. The Results of Panel Data Analysis for All Periods, Pre-Crisis & Crisis

	Dependent Variable : ROA				
	Independent Variables	**Coefficient**	**Standard Error**	**z Statistics**	**Probability**
2006Q1-2011Q3	**C**	-0,0075	0,002	-3,24***	0,001
	NWCTA	0,0428	0,043	8,75***	0,000
	InvTA	-0,0285	0,010	-2,82***	0,005
	EBITTA	0,7912	0,010	77,19***	0,000
	stfideTA	-0,1286	0,009	-13,59***	0,000
	ltfideTA	-0,1653	0,005	-35,95***	0,000
	Number of observations	3607			
	Number of groups	157			
	Wald chi2(5)	10.131,04***			
	Prob > chi2	0,000			
	Log likelihood	4.691,32			
PRE-CRISIS	**C**	-0,0248	0,002	-10,17***	0,000
	NWCTA	0,0419	0,006	7,41***	0,000
	InvTA	-0,0293	0,010	-2,83***	0,005
	EBITTA	0,9239	0,010	93,93***	0,000
	stfideTA	-0,0737	0,010	-7,16***	0,000
	ltfideTA	-0,1135	0,006	-19,38***	0,000
	Number of observations	1570			
	Number of groups	157			
	Wald chi2(5)	12.050,7***			
	Prob > chi2	0,000			
	Log likelihood	2655,378			
CRISIS	**C**	0,0009	0,004	0,23	0,816
	NWCTA	0,0515	0,008	6,8***	0,000
	InvTA	-0,0532	0,017	-3,18***	0,001
	EBITTA	0,6644	0,017	38,17***	0,000
	stfideTA	-0,1127	0,016	-7,24***	0,000
	ltfideTA	-0,1913	0,007	-28,92***	0,000
	Number of observations	1880			
	Number of groups	157			
	Wald chi2(5)	3.617,78***			
	Prob > chi2	0,000			
	Log likelihood	2161,499			
* p<0,10; ** p<0,05; *** p<0,01;					

3.5.2. Panel Data Analysis for Financial Performance

To obtain more detailed results, the relationship between financial performance and firm financial indicators is analyzed depending on the results obtained with GLS between 2006Q1 and 2011Q3. The output tables obtained from STATA and their interpretations are provided below.

As shown in Table 7, for the whole sample period, the value of Wald chi2 test statistic is 10131,04 and the p value is 0,000 which means that the model is significant at 1% level. The p value of all independent variables is 0,00 which means that they are statistically significant at 1% level also apparent from their z-statistics.

ROA is positively and significantly affected by NWCTA increase (z=8,75 p<0,01). The coefficient means that one unit increase in NWCTA will explain 0,0428 units change in ROA when the other independent variables are hold constant. This empirical result is not surprising as the adequate management of firm liquidity is an important factor of financial performance of a firm.

InvTA increase also affects ROA significantly but negatively (z = - 2,82 p<0,01). One unit increase in InvTA explains - 0,0285 units change in ROA when the other independent variables are hold constant. It means that the increase of inventories can be a signal that the inventories cannot be depleted as usually and the keeping too much inventory harms firm profitability.

The most significant independent variable in the model is EBITTA and is positively affects ROA (z = 77,19 p<0,01). Its coefficient (0,7912) indicates a very powerful relationship. It is not surprising that a firm financial performance is highly related to its capability to increase its cash flows from its operations. It is the primary component of firm profitability.

stfideTA and ltfideTA increases also affect ROA significantly but negatively (z = - 13,59 p<0,01

and z = -35,95 and p<0,01 respectively). The coefficients are - 0,1286 (p<0,01) for stfideTA and - 0,1653 (p<0,01) for ltfideTA respectively. The effect is magnified for the ltfideTA. The ltfideTA coefficient means that one unit increase in ltfideTA will explain 0,1653 units decrease in ROA when the other independent variables are hold constant. These findings are in line with the previous literature. When the amount of debt rises, its associated costs also increase causing deterioration of financial performance of a firm.

When the same analyses are conducted for the pre-crisis and crisis periods, the findings are also illustrated in Table 7. For both periods, the values of Wald test statistic are 12.050,7 and 3.617,78 respectively and their p values are 0 which means that both models are statistically significant at 1% significance level. The independent variables of both periods are also significant at 1% level except the constant term that is not significant in the crisis period.

Before crisis, NWCTA is again significant and affects ROA positively. However, this coefficient has become larger during crisis. Working capital management becomes more important during the crisis period.

The effect of variable InvTA on ROA is magnified in the crisis period compared to the pre-crisis period. The crisis coefficient is used to be -0,0532 which was -0,0293 in the pre-crisis period. Good management of inventories has more effect on firm profitability during an economic crisis. The macro data reveals that the consumption has decreased in the crisis period thus accumulation of excess inventories gives harm to business profitability.

The most significant independent variable in the model continues to be EBITTA in both periods. It positively affects ROA (z = 93,93 p<0,01) and its coefficient (0,9239) indicates a very powerful relationship before crisis. This attribute has changed and its coefficient has decreased to 0,6644 (z = 38,17 p<0,01) in crisis. It can mean that not only the cash flows are the main determinant of the firm profitability but the other factors become important during difficult times.

The variables stfideTA and ltfideTA continue to be negative and significant for both periods. During crisis, the coefficients of stfideTA and ltfideTA become - 0,1127 and - 0,1913 respectively. They are used to be - 0,0737 and - 0,1135 respectively before crisis. It is obvious that the explanatory power of financial debts in changes of financial performance has increased during crisis. Firms highly indebted to banks are probably the ones that have suffered most from this economic turmoil. Their interest expenditures are higher and their operating margins are thinner.

4. Conclusion

Several researches have been conducted to find out the effects of crises on economy and the real sector. This study focuses on the real effects of the 2008 global economic crisis on Turkish manufacturing sector firms listed on Borsa Istanbul.

When the crisis literature about firms is scrutinized, many articles can be found. They provide a good reference as they examine firms' financial performance in the pre-crisis, crisis and post-crisis periods. The findings show that the firms with high leverage ratio and high ratio of short-term debt over total debt tend to suffer most in crisis times thus these two ratios are the indicators of financial vulnerability in a sense. These firms reacted to crisis by decreasing their leverage levels and becoming more conservative in terms of investment. In addition, the analyses provide evidence that the micro story has the power to reveal the macro effects as the decreases in sales and inventories signal GDP contraction for a country.

In the light of these researches, the financial data of 157 manufacturing firms listed on Borsa Istanbul is analyzed. First, on an aggregate basis, the numbers say that the firms diminished their investments and their inventories eroded significantly. There was a significant increase in short-term financial debt. Their equity was melting down by 1/3 in the first quarter of 2009 due to losses. These financial figures do not catch the pre-crisis levels even in 2011Q3. Only total sales recovered and returned to 2007 level in 2010.

Second, panel data analysis is conducted with GLS technique with same firms to see effects of selected financial variables on firm financial performance. It can be concluded that profitable firms in

the pre-crisis period succeeded to stay again constant during crisis period. Firms with a conservative leverage policy performed better in financial terms compared to other firms during this global crisis. The results also underline that net working capital and inventory management become important especially during difficult times.

Although the summarized literature gives reference for many study areas to suggest for Turkish firms as the further research, the analysis of the post-crisis period should be at the first place as it will complete this study. Second, the crisis effects can be analyzed for manufacturing sub-sectors that do not have any data constraints.

Appendix 1. Borsa Istanbul Quote of Firms used in the Empirical Study

1	ADANA
2	ADEL
3	AEFES
4	AFYON
5	AKALT
6	AKCNS
7	AKSA
8	ALCAR
9	ALKA
10	ALKIM
11	ALTIN
12	ALYAG
13	ANACM
14	ARCLK
15	ARSAN
16	ASLAN
17	ASUZU
18	ATEKS
19	AYGAZ
20	BAGFS
21	BAKAB
22	BANVT
23	BERDN
24	BFREN
25	BISAS
26	BOLUC
27	BOSSA
28	BRISA
29	BRMEN
30	BRSAN
31	BSOKE
32	BSPRO-BSHEV
33	BTCIM
34	BUCIM
35	BURCE
36	BURVA
37	CBSBO
38	CCOLA
39	CELHA
40	CEMTS
41	CEYLN
42	CIMSA
43	CMBTN
44	CMENT
45	DARDL
46	DENCM
47	DENTA
48	DERIM
49	DESA
50	DEVA
51	DGZTE
52	DITAS

53	DMSAS
54	DOBUR
55	DOGUB
56	DOKTS COMDO
57	DUROF-DURDO
58	DYOBY
59	ECILC
60	ECYAP
61	EDIP
62	EGEEN
63	EGGUB
64	EGPRO
65	EGSER
66	EMKEL
67	EMNIS
68	EPLAS
69	ERBOS
70	EREGL
71	ERSU
72	ESEMS
73	FENIS
74	FMIZP
75	FRIGO
76	FROTO
77	GEDIZ
78	GENTS
79	GEREL
80	GOLDS
81	GOLTS
82	GOODY
83	GUBRF
84	HEKTS
85	HURGZ
86	HZNDR
87	IDAS
88	IHEVA
89	IPMAT-IPEKE
90	IZMDC
91	IZOCM
92	KAPLM
93	KARSN
94	KARTN
95	KENT
96	KERVT
97	KLBMO
98	KLMSN
99	KNFRT
100	KONYA
101	KORDS
102	KOZAA-KOZAD
103	KRDMD
104	KRSTL
105	KRTEK
106	KUTPO
107	LUKSK
108	MAKTK
109	MEMSA
110	MERKO
111	MIPAZ-MILYT
112	MNDRS
113	MRDIN
114	MRSHL
115	MRTGG
116	MTEKS
117	MUTLU
118	NUHCM
119	OLMKS
120	OTKAR
121	PARSN
122	PENGD
123	PETKM
124	PETUN
125	PIMAS
126	PINSU
127	PNSUT
128	PRTAS
129	PTOFS
130	SARKY
131	SASA
132	SELGD
133	SERVE
134	SILVR
135	SKPLC
136	SKTAS
137	SNPAM
138	SODA
139	SONME
140	TATKS
141	TBORG
142	TIRE
143	TOASO
144	TRCAS
145	TRKCM
146	TTRAK
147	TUDDF
148	TUKAS
149	TUPRS
150	ULKER
151	UNYEC
152	USAK
153	VESBE
154	VESTL
155	VKING
156	YATAS
157	YUNSA

Appendix 2. Financial and Non-financial Figures Used in the Study

	FINANCIAL FIGURES	
1	Cash	cash
2	Mark Sec	marketable securities
3	ST Trade Rec	short-term trade receivables
4	Inventories	inventories
5	CUR ASSETS	current assets
6	LT Trade Rec	long-term trade receivables
7	Fix Assets	fixed assets
8	TOT ASSETS	total assets
9	ST Fin Debts	short-term financial debt
10	ST Trade Pay	short-term trade payables
11	ST LIAB	short-term liabilities
12	LT Fin Debts	long-term financial debt
13	LT Trade Pay	long-term trade payables
14	LT LIAB	long-term liabilities
15	TOT SHE	total shareholders' equity
16	Net Sales	net sales
17	COGS	cost of goods sold
18	GROSS PROFIT	gross profit
19	Opex	operating expenses
20	Other Oper Inc	other operating income
21	Other Oper Exp	other operating expense
22	OPER PROFIT-LOSS	operating profits
23	Fin Inc	financial income
24	Fin Exp	financial expenses
25	Net Fin Inc-Exp	net financial income
26	Inc BefTax	income before tax
27	NET INC-LOSS	net income
28	Depr and Amort Exp	depreciation and amortization expense
29	EBIT	earnings before interest and tax
30	EBITDA	earnings before interest and tax+depreciation and amortization
31	NWC	net working capital
32	Tot Debt	total debt (current liabilities+long-term liabilities)
33	Total Fin Debt	total financial debt
34	Net Debt	net debt (total debt-cash holdings)
35	Cash Holdings	cash+marketable securities
36	Change in Sales	quarterly change in net sales
37	Change in EBIT	quarterly change in EBIT
38	Change in EBITDA	quarterly change in EBITDA
39	Capex	capital expenditures
40	INVESTED CAPITAL	invested capital (net working capital + fixed assets)
41	Interest Exp	interest expenditures
	NON-FINANCIAL FIGURES	
42	Company age	number of years from the establishment to 2006
43	Employees No	total number of employees (workers included)

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