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EFFECTS of 2008 GLOBAL ECONOMIC CRISIS on EMPLOYMENT OF MANUFACTURING COMPANIES

2008 GLOBAL EKONOMİK KRİZİN ÜRETİM FİRMALARI İSTİHDAMINA ETKİLERİ

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ABSTRACT

Many studies have been conducted in several countries to analyze effects of the 2008 global crisis. This study makes a significant contribution to crisis literature as it focus on the employment perspective of 112 manufacturing companies listed on Bourse İstanbul. The analysis shows that an important amount of layoffs has occurred in the first quarter of 2009. Improvement in employment can only be achieved in the second quarter of 2010. The panel data analysis conducted proves evidence that net debt and total assets have an effect on employee number. The general conclusion emphasizes the fact that firms that have less debt perform better compared to firms having more debt during this global crisis from the employment perspective.

Keywords: Employment, crisis, unemployment, panel data analysis

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'a kote olan 112 Türk imalat sanayi şirketi üzerinde istihdam açısından incelenmesi sebebiyle kriz literatürüne yenilik getirmektedir. Toplanan veriler ışığında 2009 birinci çeyreğinde, göze çarpan bir işten çıkarma gerçekleşmiştir. İstihdamda iyileşme ancak 2010 ikinci çeyreğinde görülebilmiştir. İstihdam verisi ile yapılan panel veri analizi, net borç ve toplam varlıkların çalışan sayısı üzerinde değişikliğe neden olduğunu göstermiştir. Genel sonuç olarak, dikkatli borçlanan şirketler diğer şirketlere kıyasla bu global kriz döneminde istihdam açısından daha iyi bir performans sergilemişlerdir.

Anahtar Kelimeler : İşgücü, kriz, işsizlik, panel veri analizi

1. INTRODUCTION

The global economic crisis initiates by subprime mortgage crisis in United States of America (USA) in August 2007 and it spreads out all over the world in 2008. It is no doubt one of the most important economic events as 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 layoffs have occurred in several countries as a consequence (Dombekci, 2014).

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, unemployment rates have also increased despite the measures undertaken to attenuate social effects of the global crisis as seen in Table 1.

Table 1: Harmonised unemployment rates in OECD countries[1][2]

As a percentage of civilian labour force															
	1991	**1995**	**2000**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Australia	9,6	8,5	6,3	5,0	4,8	4,4	4,2	5,6	5,2	5,1	5,2	5,7	6,1	6,1	5,7
Austria	..	4,2	3,9	5,6	5,3	4,9	4,1	5,3	4,8	4,6	4,9	5,4	5,6	5,7	6,0
Belgium	6,4	9,7	6,9	8,4	8,3	7,5	7,0	7,9	8,3	7,2	7,6	8,5	8,5	8,5	7,9
Canada	10,3	9,5	6,8	6,8	6,3	6,1	6,1	8,4	8,1	7,5	7,3	7,1	6,9	6,9	7,0
Chile	8,2	7,3	9,7	9,2	7,8	7,1	7,8	9,7	8,2	7,1	6,4	5,9	6,4	6,2	6,5
Czech Republic	..	4,0	8,8	7,9	7,1	5,3	4,4	6,7	7,3	6,7	7,0	7,0	6,1	5,1	4,0
Denmark	7,9	6,7	4,3	4,8	3,9	3,8	3,5	6,0	7,5	7,6	7,5	7,0	6,5	6,2	6,2
Estonia	..	..	14,5	8,0	5,9	4,6	5,5	13,6	16,7	12,4	10,0	8,6	7,4	6,2	6,8
Finland	6,6	15,4	9,8	8,4	7,7	6,9	6,4	8,2	8,4	7,8	7,7	8,2	8,7	9,4	8,8
France	9,6	12,0	9,6	8,9	8,8	8,0	7,4	9,1	9,3	9,2	9,8	10,3	10,3	10,4	10,1
Germany	5,5	8,3	8,0	11,3	10,3	8,5	7,4	7,6	7,0	5,8	5,4	5,2	5,0	4,6	4,1
Greece	..	..	11,2	10,0	9,0	8,4	7,8	9,6	12,8	17,9	24,5	27,5	26,6	25,0	23,6
Hungary	..	..	6,3	7,2	7,5	7,4	7,8	10,0	11,2	11,1	11,0	10,1	7,7	6,8	5,1
Iceland	..	..	..	2,6	2,9	2,3	3,0	7,2	7,6	7,1	6,0	5,4	5,0	4,0	3,0
Ireland	14,8	12,3	4,3	4,4	4,5	4,7	6,4	12,0	13,9	14,7	14,7	13,1	11,3	9,5	7,9
Israel	..	6,9	8,8	9,0	8,4	7,3	6,1	7,5	6,6	5,6	6,9	6,2	5,9	5,2	4,8
Italy	8,5	11,2	10,1	7,7	6,8	6,1	6,7	7,8	8,4	8,4	10,6	12,1	12,7	11,9	11,7
Japan	2,1	3,2	4,7	4,4	4,1	3,8	4,0	5,1	5,1	4,6	4,4	4,0	3,6	3,4	3,1
Korea	2,5	2,1	4,4	3,7	3,5	3,3	3,2	3,7	3,7	3,4	3,2	3,1	3,5	3,6	3,7
Latvia	..	..	14,3	10,1	7,0	6,1	7,7	17,6	19,5	16,2	15,0	11,9	10,9	9,9	9,6
Luxembourg	1,7	2,9	2,2	4,7	4,6	4,2	4,9	5,1	4,6	4,8	5,1	5,9	6,1	6,5	6,3
Mexico	2,7	6,3	2,5	3,6	3,6	3,7	4,0	5,5	5,4	5,2	5,0	4,9	4,8	4,4	3,9
Netherlands	5,7	8,4	3,7	5,9	5,0	4,2	3,7	4,4	5,0	5,0	5,8	7,2	7,4	6,9	6,0
New Zealand	10,6	6,5	6,2	3,8	3,9	3,6	4,0	5,8	6,2	6,0	6,4	5,8	5,4	5,4	5,1
Norway	5,5	4,9	3,2	4,5	3,4	2,5	2,6	3,2	3,6	3,3	3,2	3,5	3,5	4,4	4,7
Poland	..	..	16,1	17,9	14,0	9,6	7,0	8,1	9,7	9,7	10,1	10,3	9,0	7,5	6,2
Portugal	4,2	7,2	5,1	8,8	8,9	9,1	8,8	10,7	12,0	12,9	15,8	16,5	14,1	12,7	11,2
Slovak Republic	..	..	18,9	16,4	13,5	11,2	9,6	12,1	14,5	13,7	14,0	14,2	13,2	11,5	9,7
Slovenia	..	..	6,7	6,5	6,0	4,9	4,4	5,9	7,3	8,2	8,9	10,1	9,7	9,0	8,0
Spain	15,5	20,8	11,9	9,2	8,5	8,2	11,3	17,9	19,9	21,4	24,8	26,1	24,5	22,1	19,7
Sweden	3,1	8,8	5,6	7,6	7,0	6,1	6,2	8,3	8,6	7,8	8,0	8,0	7,9	7,4	7,0
Switzerland	..	..	..	..	..	..	..	..	4,5	4,0	4,2	4,4	4,5	4,5	4,6
Turkey	**..**	**..**	**..**	**9,2**	**8,8**	**8,8**	**9,7**	**12,6**	**10,7**	**8,8**	**8,2**	**8,7**	**10,0**	**10,3**	**10,9**
United Kingdom	8,6	8,5	5,4	4,8	5,4	5,3	5,6	7,6	7,8	8,1	7,9	7,6	6,1	5,3	4,8
United States	6,8	5,6	4,0	5,1	4,6	4,6	5,8	9,3	9,6	9,0	8,1	7,4	6,2	5,3	4,9
OECD[a]	**..**	**..**	**6,2**	**6,6**	**6,1**	**5,6**	**6,0**	**8,1**	**8,3**	**8,0**	**8,0**	**7,9**	**7,4**	**6,8**	**6,3**

Source: OECD (2017), Main Economic Indicators, Vol. 2017/5, OECD Publishing, Paris, http://dx.doi.org/10.1787/mei-v2017-5-en.

Some OECD countries' unemployment rates differ very slightly such as Belgium, Germany, Italy, Japan, Korea, Luxembourg, Netherlands and Norway in 2009 as their unemployment rates have recorded increases ≤ 1 %. Looking to Germany for its very small unemploymenr rate change (0,2%), it can be deducted that this is due mainly to non-neoliberal dimensions of German economy which has insisted to protect core employment, technological capabilities and export competitiveness (Storm and Naastepad, 2015). However; Estonia, Iceland, Ireland, Latvia and Spain have to face significant increases in their unemployment rates surpassing 4%. These countries (except Iceland) and Turkey have reached double digit numbers in their unemployment rates in 2009.

2. LITERATURE REVIEW

Taking into account the magnitude of the crisis, many researchers have analyzed crisis effects in their homelands and in other countries. This is important from the point of taking lessons and improving ways to deal with such a difficult economic turmoil by learning from each other.

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

[1] a) Weighted average.

[2] The OECD harmonised unemployment rates are compiled for 35 OECD member countries and conform to the guidelines of the 13th Conference of Labour Statisticians of the International Labour Office (referred to as the ILO guidelines). In so far as possible, the data have been adjusted to ensure comparability over time. All series are benchmarked to labour-force-survey-based estimates. The unemployment rates for the European Union member countries, Norway and Turkey are produced by the Statistical Office of the European Communities (Eurostat). For the remaining OECD countries, the OECD is responsible for collecting data and calculating unemployment rates. Please refer to the following URL for methodological notes: www.oecd.org/std/labourstatistics/44743407.pdf.

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.

Hernando and Martinez-Carrascal (2005) preferred to study impact of financial variables on Spanish non-financial firms' real decisions such as investment in fixed assets (investment) and number of employees (employment). Their idea is to understand the effect of corporate sector financial position on real economy. They have gathered 7.547 firms' data belonging to the period 1985-2001. This study analyzes response of investment and employment to changes in financial variables like interest debt burden, total debt burden, debt ratio, net debt ratio, gross revenue and cash flow. They divide data into percentiles and run regression analyses. Their findings are as follows; in general Spanish firms are highly dispersed with regard to financial pressure indicators. Financial position affects fixed investment and employment. The net debt term is significant in the investment equation. In the employment equation, the net debt terms are never significant in linear specifications but in non-linear specifications. The regression analysis shows that investment and employment are more sensitive to financial conditions for firms classified in the upper percentiles of the distribution for the related financial variable. Finally, they conclude that the effects of financial variables become more pronounced when a certain threshold in financial pressure is reached. In other words, the financial position of a median firm is not representative of the position of the total corporate sector. During difficult times, micro data is suggested to be better to detect corporate vulnerabilities as it excludes the offsetting effects of the well performing firms.

Campello, Giambona, Graham and Harvey (2010) conducted a survey to 800 chief financial officers (CFOs) from North America, Europe, and Asia to analyze the crisis effects. The aim is to understand CFOs' preferences on different sources of liquidity like credits, cash holdings and profits and the relation between liquidity management and company expenditure plans like investment, technology, and employment expenditures during a crisis period. The results of the survey indicate that firms that own more cash holdings and have more cash flows tend to use less credits thus firms with sufficient internal funds choose not to use external funds during a crisis. The reason for this is the increased credit costs. When firm profitability thus its cash flow increases, the capacity of firm to raise more credits also increases. Meanwhile, if firms with higher cash flows prefer to hold more cash in their pockets, they tend to use less credits during difficult times. Thus cash flows and cash holdings of a firm have opposing effects on the use of credits. At the average level of cash, an increase in credits does not change a firm's investment plans. In contrast; investment, technology and employment expenditures are decreased when a firm lacks credits. At the higher level of cash, raising more credits increases investment plans of a firm. At this level, availability of credits diminishes the negative effects of crisis on real-side decisions, such as capital investment, technology spending and employment.

Campello, Graham and Harvey (2009) conducted a second survey but this time among 1.050 chief financial officers (CFOs) in 39 countries in North America, Europe and Asia to see real effects of financial constraints during 2008 global crisis. The survey provides evidence that financially constrained firms prefer to hold more cash to be able to use it in difficult times. Most of these firms reject to undertake profitable investments due to external finance difficulties and even some firms plan to sell their assets for cash during crisis. They also plan to decrease their technology, marketing and employment expenditures. Financially constrained firms substantially burn out their cash holdings and plan to cease dividend payments. However, unconstrained firms' indicators stay constant, in other words, stay as they were before crisis. These results are valid in all the three continents.

Bentolila, Cahuc, Dolado and Le Barbanchon (2010) analyze changes in unemployment rate of France and Spain caused by 2008 global crisis. The main reason to choose these two European countries is that their labor institutions are similar and their unemployment rates before crisis are set to be around 8%. This crisis causes this rate to jump to 10% only in France whereas to 19% in Spain at the end of year 2009. This can be explained by the fact that France has adopted employment protection legislation just before the crisis but Spain has not.

Elsby, Hobijn and Sahin (2010) study US labor market to see effects of 2008 crisis. Unemployment rate has risen from a pre-recession minimum of 4,4% to reach 10,1% in October 2009. However, magnitude of the change is bigger during Great Depression. In 1929, the unemployment rate stood at 3,2%, rising to 25,2% by 1933, a 22 percentage point rise in four years. They find that male, younger, less educated workers and individuals from ethnic minorities; experience more joblessness during all recessions, including this recent one. Long-term unemployment has also increased. Despite all these negative circumstances, the US recovery is faster compared to the labor problems faced by Europe in the 1980s.

Çabuk and Özkan (2010) examine effects of the global crisis for firms operating in Bursa. The city of Bursa is well known for its mostly export-oriented sectors such as automotive and textile that have a significant contribution to Turkish total exports. Their study shows that exports thus production have decreased and employment has been affected tremendously between 2008 and 2009.

Hatipler (2011) summarizes effects of the crisis on Turkish economy from the macro perspective.

Huang, Zhi, Huang, Rozelle and Giles (2011) focus on the effect of the financial crisis on rural off-farm employment in China. 49 million have lost their jobs between October 2008 and April 2009 and have returned to agriculture at their home villages. Half of the laid-offs are rehired in off-farm work by April 2009. The contribution of crisis to rural unemployment rate was 1,5-2 % by August 2009. Meanwhile, fallen wages have also made the recovery easier in 2009.

Carneiro, Portugal and Varejão (2014) focus on the effects of the crisis in Portuguese labor market. The crisis caused a deep recession in the country as a result the Portuguese government has to apply for a rescue plan to European Union and International Monetary Fund. They state that many firms have declared bankruptcy, unemployment rates have almost tripled; long-term unemployment and number of temporary workers have increased tremendously.

Hijzen, Kambayashi, Teruyama and Genda (2015) analyze Japanese labor market during the global financial crisis and the role of temporary work force in adjustment behavior. They find that average hours worked have been adjusted by the employers and the percentage of temporary work has increased. They underline that crisis effects are not very strong in Japan as the global financial crisis has been initiated outside Japan and it has a temporary nature.

Burger, Damijan, Kostevc and Rojec (2017) examine crisis effects on 1,7 million firms in Central and Eastern European countries (Bulgaria, Czech Republic, Croatia, Hungary, Macedonia, Poland, Romania, Slovenia and Slovakia) from the perspective of employment and investment between 2000 and 2012. The results underline that most of the firms prefer to lay off when sales decrease but they respond more when there is a demand expansion. Small firms, old small firms and non-exporter firms react more to demand shocks in case of employment responses.

Fernandes and Ferreira (2017) study firm-level data in Portugal to see effects of 2008 global crisis. They analyze composition of newly hired employees when it is possible to choose between permanent and fixed-term workers after 2008-2009 crisis. Their analysis emphasizes that financially vulnerable firms are more inclined to hire fixed-term workers with respect to permanent workers after crisis. This will bring decreased accumulation of human capital and productivity in the long run.

3. WHAT HAPPENS IN TURKEY?

3.1. Unemployment in Turkey

As it is a global crisis, Turkey has also been affected. Turkish GDP has contracted by 4,8% in 2009. The industrial production index has hit the lowest level in February 2009 and the capacity usage in April 2009 respectively.

The rates of unemployment for whole labor force and non-agriculture labor force first jumped to 11% and 13,6% respectively in 2008. The highest levels (14% and 17,4%) were recorded in 2009. The pre-crisis levels can only be reached in 2011. The unemployment rate of youth jumped from 20,5% to 25,3% in 2009. The recovery in years 2010 and 2011 was not enough to diminish this rate to pre-crisis levels (Dömbekci, 2012).

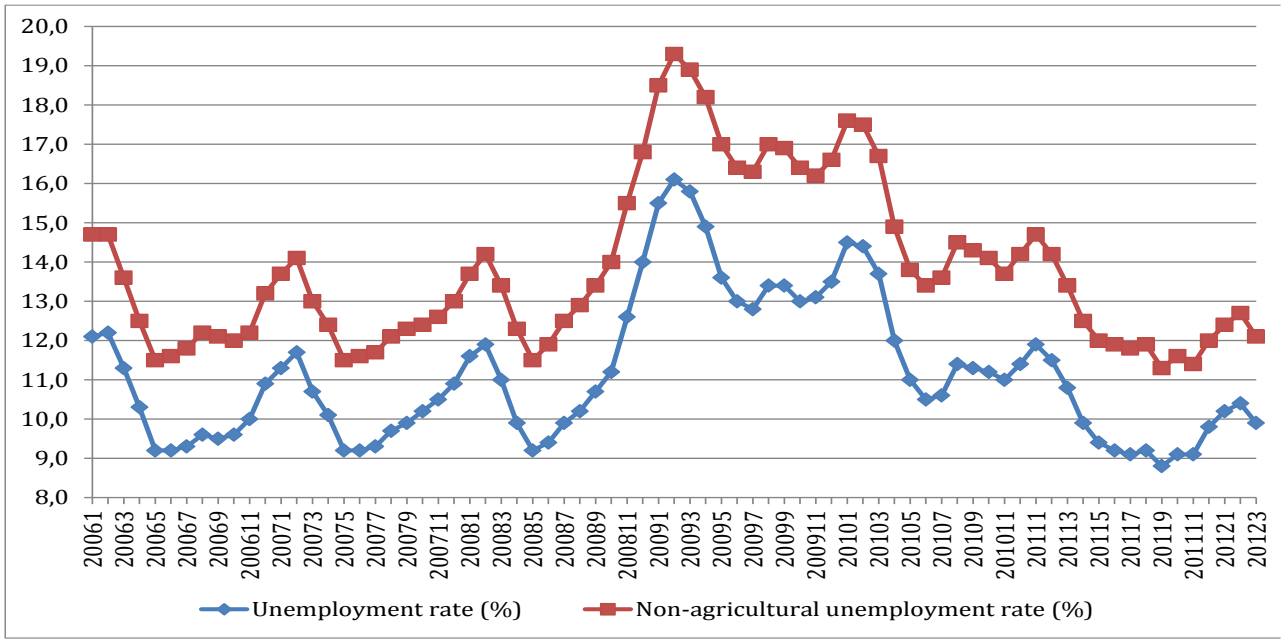
Table 2: Labor Force Statistics (2004-2011)

1000 people	2004	2005	2006	2007	2008	2009	2010	2011
Non-institutional population	66.379	67.227	68.066	68.901	69.721	70.542	71.343	72.376
% growth		*1,3%*	*1,2%*	*1,2%*	*1,2%*	*1,2%*	*1,1%*	*1,4%*
Population 15 years and over	47.544	48.359	49.174	49.994	50.772	51.686	52.541	53.593
% growth		*1,7%*	*1,7%*	*1,7%*	*1,6%*	*1,8%*	*1,7%*	*2,0%*
Labour force	22.017	22.455	22.751	23.114	23.805	24.748	25.641	26.725
% growth		*2,0%*	*1,3%*	*1,6%*	*3,0%*	*4,0%*	*3,6%*	*4,2%*
Labour force participation rate	46,3%	46,4%	46,3%	46,2%	46,9%	47,9%	48,8%	49,9%
Employed	19.632	20.067	20.423	20.738	21.194	21.277	22.594	23.817
Employment rate	*41,3%*	*41,5%*	*41,5%*	*41,5%*	*41,7%*	*41,2%*	*43,0%*	*44,4%*
Unemployed	2.385	2.388	2.328	2.376	2.611	3.471	3.046	2.615
Unemployment rate	*10,8%*	*10,6%*	*10,2%*	*10,3%*	***11,0%***	***14,0%***	***11,9%***	*9,8%*
Non-agriculture employment rate	*14,2%*	*13,5%*	*12,7%*	*12,6%*	***13,6%***	***17,4%***	***14,8%***	*12,4%*
Unemployment rate of youth (15-24 years)	*20,6%*	*19,9%*	*19,1%*	*20,0%*	*20,5%*	***25,3%***	***21,7%***	***22,5%***
Non-registred labour force	9.843	9.666	9.593	9.423	9.220	9.328	9.772	10.150
Labour force participation rate	*20,7%*	*20,0%*	*19,5%*	*18,8%*	*18,2%*	*18,0%*	*18,6%*	*18,9%*

Source: Household Labor Force Statistics 2011, TURKSTAT

When monthly development of unemployment rates is examined, first difference is caught in August 2008 when unemployment rates are above their average levels recorded in the previous years. This difference is underlined in November when they surpass their peak values of previous years. The new peaks of overall unemployment rate of 16,1% and non-agriculture unemployment rate of 19,3% are recorded in February 2009. The second highest levels are reached with unemployment rate of 14,5% and non-agriculture unemployment rate of 17,6% in January 2010. After this month, a gradual recovery can be obtained as seen in Graph 1.

Graph 1: Monthly Unemployment Rates



Source: TURKSTAT

3.2. Data

The crisis has also some effects on employment of manufacturing companies. To analyze this effect, the employee number of 112 manufacturing companies listed on Bourse Istanbul between first quarter of 2006

and third quarter of 2011 is collected from their quartely annual reports. The sample period is divided into two sub-periods as pre-crisis period (2006Q1-2008Q3) and crisis period (2008Q4-2011Q3). Although there are 157 manufacturing companies listed during the study period, some of them are eliminated. First, firms that have missing employees' number in some quarters are eliminated from the analysis. Second, firms whose total assets have increased or decreased above 100% are considered as outliers and are also eliminated.

The median value is calculated for total assets to classify firms according to their size. The firms whose total assets are above this median value are categorized as big firms and whose total assets are below this median value as small firms respectively. For the sample period, big firms employ on average 2.454 people while small firms 451 people respectively.

When total number of employees is considered, crisis effect is seen in 2009Q1. 21.277 new posts are created in pre-crisis period in contrary to 13.415 posts in crisis period. From the pre-crisis and crisis perspectives, number of firms whose average quarterly positive change in employees in pre-crisis period is 67 whereas this number is just 57 for crisis period. Table 3 situated below shows details of following results:

- ✓ For each quarter, number of firms that increase or decrease employees is found out. 2008Q4 and 2009Q1 are top two periods where most of the firms have preferred to lay out due to their deteriorating financial performance. Biggest lay outs take place in 2009Q1 with 11.850 employees and in 2009Q4 with 1.194 employees and first drop in average employees number during sample period is also seen in 2009Q1 as shown in Table 3 in a separate column.
- ✓ The firms' employment level of 2008Q3 can only be reached in 2010Q3. The quarters in between are marked by crisis effect. Following these difficult times, recovery in corporate employment takes place in 2010Q2 and 2010Q3 and the first three quarters of 2011.
- ✓ Only 18 firms have succeeded to increase their employee number in 2009Q1 where the biggest lay out took place (TRCAS is eliminated as their employees are transferred due to merger). Mean employee change is found by calculating quarterly change of every firm then by calculating the average of these changes.

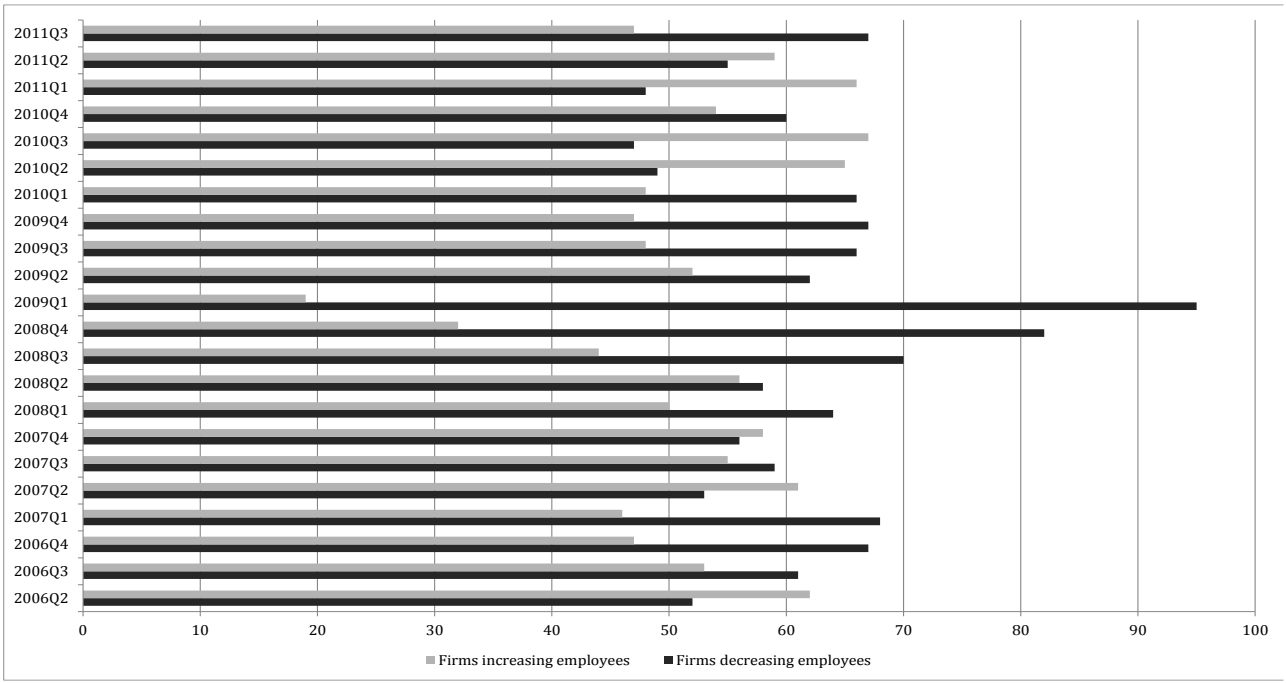
Table 3: Crisis Effect on Employment

N=112	Total Employees	Average Employees	Quarterly Change (people)	Mean Employee Change (%)	Number of firms that decreased their employees or reserved same number
2006Q1	146.927	1.312			
2006Q2	149.161	1.332	2.234	0,81%	52
2006Q3	153.290	1.369	4.129	3,76%	61
2006Q4	154.518	1.380	1.228	-1,62%	67
2007Q1	156.268	1.395	1.750	-0,32%	68
2007Q2	156.176	1.394	-92	1,18%	53
2007Q3	157.020	1.402	844	0,65%	59
2007Q4	161.127	1.439	4.107	1,63%	56
2008Q1	166.067	1.483	4.940	0,98%	64
2008Q2	166.400	1.486	333	-0,33%	58
2008Q3	168.204	1.502	1.804	1,74%	70
2008Q4	170.826	1.525	2.622	-4,44%	82
2009Q1	158.976	1.419	-11.850	-6,56%	95
2009Q2	159.496	1.424	520	3,30%	62
2009Q3	160.348	1.432	852	6,70%	66
2009Q4	159.154	1.421	-1.194	1,15%	67
2010Q1	158.892	1.419	-262	-2,33%	66
2010Q2	163.868	1.463	4.976	2,65%	49
2010Q3	170.167	1.519	6.299	3,35%	47
2010Q4	169.908	1.517	-259	0,88%	60
2011Q1	175.606	1.568	5.698	1,13%	48
2011Q2	178.147	1.591	2.541	2,13%	55
2011Q3	181.619	1.622	3.472	0,80%	67

Source: FINNET, Annual Reports

- ✓ The number of firms that decreased their employees is higher than those that recruit additional staff beginning from 2008Q1 and this situation lasts until 2010Q2 as indicated in detail in Graph 2.

Graph 2: Number of firms that decreased their employees or reserved same number



Source: FINNET, Annual Reports

3.3. Results of Panel Data Analysis

Quarterly data for number of employees that firms have are put into a panel model with liquidity and leverage related financial variables and their ratios. No significant relationship can be obtained with any of them except total assets and net debt. Company age dummy has been created to see if there is an effect depending on whether the firm is old or young. R square of these models, thus the relationship was small. There is one variable, total assets, which has an explanatory power of variations that take place in firms' employee number. To assure the linearity relationship between employee number and total assets, the logarithmic transformation of two variables has been made. A crisis dummy is added to the final model to see crisis effects on employee number. The observation has the value of 0 if it is between 2006Q1 and 2008Q3 and 1 if it is between 2008Q4 and 2011Q3. In summary, LEmpno is the dependent variable while logtotass and CrisisDum are the explanatory variables for this model. GLS estimation is made via STATA program[3]. The output table is shown below (UCLA Resources).

Table 4: Panel Data Analysis, GLS (2006Q1-2011Q3)

Dependent Variable : Log of Employees Number					
	Independent Variables	**Coefficient**	**Standard Error**	**z Statistics**	**Probability**
2006Q1-2011Q3	**C**	-2,5742	0,147	-17,53***	0,000
	CrisisDum	-0,3089	0,035	-8,84***	0,000
	LogTA	0,7386	0,012	62,5***	0,000
	Number of observations	2576			
	Number of groups	112			
	Wald chi2(2)	3.928,43***			
	Prob > chi2	0,000			
	Log likelihood	-3.338,60			
* p<0,10; ** p<0,05; *** p<0,01;					

[3] Appendix 1.

Table 4 reveals that logtotass is positive and significant at 1% level (z=62,50, p<0,01). The coefficient of total assets indicates that if we multiply total assets by e (e=2,718) then we multiply employee number by e ^{0,74} (2,1 thus 110%). The elasticity between these two variables is high. logtotass is a variable indicating firm size. The bigger the firm the higher is employment capacity of the firm.

CrisisDum variable is also significant but negative (z= - 8,84 p<0,01). The crisis has affected employee number of firms as the crisis hits firms. If we multiply employees number by e $^{-0,31}$ (0,73), this means a decrease of 27% in employee number due to crisis.

The search for another explanatory variable has been successful in line with the literature and a second model with NetDebtTA variable is formed and analyzed with GLS Estimation[4]. This variable is defined as total debt (short and long term liabilities) minus cash holdings (cash and marketable securities) over total assets. The estimation output is shown in Table 5. NetDebtTA coefficient is negative and significant at 10% level (z = -1,65 p<0,10). The coefficient of NetDebtTA indicates that if NetDebtTA increases by 1 unit then employees number is multiplied by e $^{-0,086}$ (=0,92). This finding means that the employee number decreases by 8%.

CrisisDum variable is also significant but negative (z= -2,95 p<0,01). The crisis has affected employees number of firms as the crisis hits firms, If we multiply employees number by e $^{-0,16}$ (=0,85), total employees number is decreased by 15 % (STATA) (UCLA Resources).

Table 5: Panel Data Analysis, GLS (2006Q1-2011Q3)

Dependent Variable : Log of Employees Number					
	Independent Variables	**Coefficient**	**Standard Error**	**z Statistics**	**Probability**
2006Q1-2011Q3	**C**	6,5021	0,045	144,10***	0,000
	CrisisDum	-0,1631	0,055	-2,95***	0,003
	NetDebtTA	-0,0860	0,052	-1,65*	0,099
	Number of observations	2576			
	Number of groups	112			
	Wald chi2(2)	11,70***			
	Prob > chi2	0,003			
	Log likelihood	-4.525,76			
* p<0,10; ** p<0,05; *** p<0,01;					

4. CONCLUSION

The global economic crisis initiates by subprime mortgage crisis in USA in August 2007 and it spreads out all over the world in 2008. It is no doubt one of the most important economic events as its effects are compared to Great Depression of the 1930s. Most of the OECD countries' economic parameters including employment underline effects of this crisis.

Several researchers have studied this crisis to see its effects on employee number. Burger, Damijan, Kostevc, Rojec, Çabuk, Özkan and Hatipler show that when demand decreases, employment deteriorates. Opler, Titman, Hernando, Martinez-Carrascal, Campello, Graham and Harvey underline that financial constraints have a direct effect on employee number. Bentolila, Cahuc, Dolado, Le Barbanchon, Huang, Zhi, Huang, Rozelle, Giles, Hijzen, Kambayashi, Teruyama and Genda; prove evidence that the recovery is faster for countries that have taken precautions like fallen wages and average hour worked, fixed-term contract employment and other employment protection legislation to face crisis effects. The mostly encountered effects of the crisis in literature are high unemployment rates, increase in long-term unemployment and in percentage of temporary workers. This will bring decreased accumulation of human capital and productivity in the long run.

Turkey also has been affected. Turkish GDP has contracted by 4,8% in 2009. The industrial production index has hit the lowest level in February 2009 and the capacity usage in April 2009 respectively. The highest levels of unemployment (14% for whole labor force and 17,4% for non-agriculture labor force) are recorded in 2009. The pre-crisis levels can only be reached in 2011. The unemployment rate of youth has jumped from 20,5% to 25,3% in 2009. The recovery in years 2010 and 2011 is not enough to diminish this rate to pre-crisis levels.

[4] Appendix 2

In light of these significant macro effects, necessity for analysis on the micro basis is felt. As a result, this study is conducted to focus on employment perspective of 112 manufacturing companies listed on Bourse İstanbul between 2006 and 2011 to trace effects of 2008 global crisis in Turkey. The analysis shows that an important amount of layoffs has occurred in the first quarter of 2009. Improvement in employment can only be achieved in the second quarter of 2010. The panel data analysis conducted proves evidence that net debt and total assets have an effect on employee number. The general conclusion emphasizes the fact that firms that have less debt perform better compared to firms having more debt during this global crisis from the employment perspective.

APPENDIX 1: The Results of Panel Data Analysis for Employment (LogTA) (GLS)

```
Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =      2576
Estimated autocorrelations =         0          Number of groups   =       112
Estimated coefficients     =         3          Time periods       =        23
                                                Wald chi2(2)       =   3928.43
Log likelihood             = -3338.596          Prob > chi2        =    0.0000
```

Lempno	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
Logtotass	.7386364	.0118188	62.50	0.000	.715472	.7618008
CrisisDum	-.308903	.0349565	-8.84	0.000	-.3774164	-.2403895
_cons	-2.574205	.1468524	-17.53	0.000	-2.86203	-2.286379

APPENDIX 2: The Results of Panel Data Analysis for Employment (NetDebtTA) (GLS)

```
Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =      2576
Estimated autocorrelations =         0          Number of groups   =       112
Estimated coefficients     =         3          Time periods       =        23
                                                Wald chi2(2)       =     11.70
Log likelihood             = -4525.763          Prob > chi2        =    0.0029
```

Lempno	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
NetDebtTA	-.0859977	.0521604	-1.65	0.099	-.1882302	.0162348
CrisisDum	-.1630515	.0553259	-2.95	0.003	-.2714884	-.0546147
_cons	6.502112	.045122	144.10	0.000	6.413674	6.590549

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