CREDIT CRUNCH OR NOT? CASE OF TURKEY DURING THE GLOBAL ECONOMIC CRISIS

BETAM WORKING PAPER SERIES #006

APRIL 2012

Credit Crunch or not? Case of Turkey during the Global Economic Crisis*

Kerim Gokay† Zümrüt İmamoğlu‡ Barış Soybilgen§

April 24, 2012

Abstract

This paper analyzes whether Turkish firms experienced a credit crunch at the outset of the global crisis. Our hypothesis is that if a credit crunch was experienced in Turkey, firms that were more dependent on external finance for investment and working capital must have been affected more severely. Hence, we should observe a higher drop in their stock returns at the time. Using firm-level data, we find that returns of firms with high dependence on external finance for working capital and balance sheet problems decline more during the crisis. We also run the same regressions for pre-crisis drops in the stock market as a placebo test. We find that stock returns were not affected by dependence on external finance for investment and working capital in non-crisis period. Our results suggest that Turkish firms might have experienced a credit crunch at the outset of the crisis even though Turkish banking sector was intact. On the other hand, we find no evidence for a demand effect: Being an exporter does not matter for the decrease in stock returns.

Keywords: Financial Crisis; Credit Crunch; Turkey

JEL: G10, G30

*The authors are grateful to Seyfettin Gürsel, Deniz Gökçe, Gökçe Uysal, Michael Haliassos and the participants at the presentation at the 73rd International Atlantic Economic Conference for their useful comments and suggestions. We thank Ayşenur Acar for her assistance with the data.

†Bahçeşehir University, mkgokay@bahcesehir.edu.tr

‡Bahcesehir University Center for Economic and Social Research, zumrut.imamoglu@bahcesehir.edu.tr

§Bahcesehir University Center for Economic and Social Research, baris.soybilgen@bahcesehir.edu.tr

1 Introduction

The financial crisis that started in the US in 2008 spread around the globe affecting both developed and developing countries. Turkey was no exception. Turkish economy slid into recession in the third quarter of 2008 and contracted for four consecutive quarters. Turkey's GDP increased by only 0.8% in 2008 and fell by 4.7% in 2009. So, how did the financial crisis in the US turned into a recession in Turkey? There are two potential answers to this question. One is that the crisis hit the Turkish economy through the demand channel; a drop in foreign demand for domestic goods and services caused the recession. The other one is that the crisis hit the economy through the finance channel; a shortage of capital from abroad reduced Turkish firms' access to credit for working capital and investment, which in turn decreased supply. Of course, it is possible that throughout the recession both of these channels were effective but the question still remains on which one preceded the other.

We try to tackle this question by studying the causes of the drop in stock returns of firms traded in the Istanbul Stock Exchange (ISE). Our hypothesis is that if there was a credit shortage, than it must be the case that the stock returns of the firms who are more reliant on external finance for operations and investments would drop more than others. If, on the other hand, the economy was hit by a drop in foreign demand, than we would expect to see a drop in the stock returns of the firms that export a significant fraction of their output. Mainly, we rely on the thought experiment of Tong and Wei (2010): If non-financial firms are classified according to their ex-ante external liquidity dependence, will this classification be able to forecast the ex-post stock returns of these firms and does this classification give us more information than Fama-French three factors and the momentum factor?

To answer this question we make use of financial characteristics that relate to the firm's short term and long term dependency on external finance. Our measure of dependency on external finance for long term investment is similar to Rajan and Zingales (1998). Our measures of dependency on external finance for short term investment are similar to those of Raddatz (2006). Our control variables include the Fama and French (1992) factors beta, firm size and book to market ratio as well as measure of momentum which was used by Lakonishok, Shleifer and Vishny (1994). We also include pre-crisis leverage ratio and fraction of exports in sales in the regressions. Among our financial dependency variables, the debt to sale ratio is strongly significant in all regressions and addition of control variables in the regression increase its magnitude, indicating that short term need for external finance can explain part of the decrease in the stock returns during the crisis. On the other hand, we

find that being an exporter did not matter for the change in returns during the crisis.

This study builds on two sets of studies in the literature. The first one is the finance literature that studies the determinents of stock returns. Starting with Fama and French's (1992) three factor model, there are many studies that eloborate on the relationship between firm characteristics and stock returns. Rajan and Zingales (1998), Raddatz (2006), Lakonishok, Shleifer and Vishny (1994) can be listed. The other set of studies in the literature we make use of tries to identify the existence of credit crunch during financial crises. Tong and Wei (2010) tries to identify whether pre-crisis exposure to non-FDI capital flows worsen the credit crunch in emerging markets in 2008. Chari, Christiano and Kehoe (2008) and Bates, Kahle and Shultz (2007) argue that there was no shortage of credit loans to firms in the United States during the crisis.

2 Main specification

In this paper, we would like the test the existence of a credit crunch for non-financial firms in Turkey. The idea is that if a credit crunch exists in an economy, then it must be harder to access credit for firms that rely highly on external finance for investment and working capital. Then one could hypothesize that these firms' market value during the crisis caused by a credit crunch should drop more. In our econometric analysis we rely mainly on the thought experiment of Tong and Wei (2010): If non-financial firms are classified according to their ex-ante external liquidity dependence, will this classification be able to forecast the ex-post stock returns and does this classification give us more information than Fama-French three factors and the momentum factor?

Figure 1 shows the change in ISE 100 (Istanbul Stock Exchange) between 2007 and 2009. The index declined 56.4% from December 2007 to March 2009. It's this period that we try to forecast the ex-post stock returns and see whether financial dependency was an important factor.

Our basic specification is as follows:

$$StockReturn = \alpha_0 + \alpha_1 * FinancialDependence + \alpha_2 * ControlVariables + \varepsilon \qquad (1)$$

Note that this is a firm level regression. All financial dependency variables are pre-

determined. The control variables are driven from asset pricing models. Next section describes both sets of variables in detail.

2.1 Financial dependence measures

We use two sets of financial dependency measures to test for the existence of credit crunch for non-financial firms in Turkey, one for long-term liquidity needs and another for short-term liquidity needs. The first set includes only one measure, the dependence on external finance for investment. The second set involves several measures such as cash conversion cycle, investment to sales ratio and short-term liabilities to sales ratio. We use these measures to capture firms need for working capital. Most of these measures have been used in the finance literature for different purposes before. In this section, we describe each one in detail.

2.1.1 Dependence on external finance for investment

Our measure for dependence on external finance for investment (ExtInv) is based on Rajan and Zingales (1998). Rajan and Zingales (1998) use this measure as a proxy for technological characteristics at the sectoral level. We use it as a proxy for need for long-term liquidity at the individual firm level. To find firms' dependence on external finance for investment, net capital expenditures is subtracted from net cash flow from operations and then divided by absolute value of net capital expenditures.[1,2]

$$ExtInv = \frac{\text{net cash flow from operations} - \text{net capital expenditures}}{|\text{net capital expenditures}|} \tag{2}$$

Both net cash flow from operations and net capital expenditures are derived from 2005, 2006 and 2007 balance sheets of publicly traded companies in the Istanbul Stock Exchange. We sum the aggregated net cash flows over three years to find firms' dependence on external finance for investment. Our hypothesis is that during a credit crunch, stock returns of firms with higher dependence on external finance for investment should decline more.

[1]It is multiplied by minus one so that positive numbers mean that firms' net cash flow from investment activities is negative.

[2]To have a meaningful variable, we use the absolute value of net capital expenditures in the denominator because over three years, some firms in our data set sell their investment goods therefore their net capital expenditures turn positive. Without taking the absolute value of the denominator, ExtInv measure for firms with high positive net cash flow from investment become positive as if they are in great demand for liquidity.

2.1.2 Dependence on external finance for working capital

Working capital is needed for firms to continue their operations and pay their short-term liabilities because there is a time span between the time firms pay for their inputs and the time they sell their outputs. Our hypotheses is that during an environment of financial tightness, firms that are in more need for external finance for working capital should be more adversely affected. Dependence on external finance for working capital cannot be observed directly and a proxy should be used for this metric. We use three proxies for dependence on external finance for working capital that were used in Raddatz (2006). The only difference is that we use it at the firm level rather than sectoral level.

Our first measure is the cash conversion cycle (CCC) which captures the number of days between purchases of a firm's inputs and its reciept of receivables from the sale of output. A higher value for the CCC indicates a greater need for working capital to operate because it takes more time to obtain the return on firm's inventory investment. CCC is given by

$$365 * \left(\frac{\text{inventories} - \text{account payables}}{\text{cost of goods sold}} + \frac{\text{account receivables}}{\text{total sales}} \right) \tag{3}$$

CCC is calculated from 2005, 2006 and 2007 balance sheets of publicly traded companies in the ISE.

Our second measure is the ratio of inventories to sales (InvSale) which measures the fraction of inventory value that can be purchased by sales revenue. A higher inventories to sales ratio signals a larger external dependence for working capital because it shows that a smaller share of inventory expeditures are covered by sales revenue.[3]

Finally, our third measure is the short-term liabilities to sales ratio (DebtSale) which evaluates fraction of short-term debt that can be paid by sales revenue. A higher DebtSale ratio indicates a higher need for external finance to cover short-term debt. This measure is constructed by using 2007 data from balance sheets of firms.

2.2 Control variables

To control for other factors that affect stock returns such as risk and demand contraction, we add control variables. Our first control variable is firm's ratio of exports in its total sales

[3]For more discussion on this measure see Raddatz (2006).

(Exports). If there is a higher contraction in foreign demand, firms with a high export ratio should experience a larger decline in their stock returns. We calculate the export ratio as the three year average of fraction of sales over years 2005, 2006 and 2007. Next, we use Fama-French (1992) three factors: beta, firm size (log of market size) and market to book value (Market/Book). We use 2007 data to estimate the Fama-French three factors. During a crisis, returns of firms with a higher beta should decline more. Tong and Wei (2010) also find that firms with small firm size and high market to book ratio experience a greater decline in their stock prices. Our fifth control variable is momentum factor from Lakonishok, Shleifer and Vishy (1994). Momentum factor is the stock return of each firm from the end of January 2007 to the end of December 2007. We expect that firms which have high stock returns before the crisis should face larger fall in their stock returns during the crisis as well. Lastly, we add leverage as control variable and it is also widely used in the literature. It is computed as total liabilities divided by stockholders' equity. Higher leverage ratios for firms lead to larger risk of default and lower credit rating (Molina, 2005). During a phase of credit tightening, firms with higher leverage may find it difficult to refinance their debt or acquire new credits.

3 Data

We take all our data from ISE. Initially, there were over 300 companies that are traded publicly in ISE in our data set. First, we remove all financial firms, conglomerates and sporting clubs which have a different balance sheet structure than non-financial firms. Then, we remove all firms which have missing data, so in the end we end up with 194 firms.

3.1 Summary statistics

Table 1 shows summary statistics for the dependent variable and all explanatory variables. Firms' stock returns declined by 45 percent on average during the crisis. ExtInv' median is 0.01 and it shows that more than 50 percent of firms needed external finance for their investment. InvSale's and DebtSale's medians are 0.14 and 0.27. Most firms can cover their inventory and debt payments with their ongoing revenue. Moreover, mean and median of leverage are 0.99 and 0.67 respectively. It means that firms are not using leverage on average.

Table 2 shows pair-wise correlations between the variables. Interestingly returns of firms

are uncorrelated with ExtInv and have slightly negative correlations with CCC, InvSale and DebtSale. Correlation between variables that measure dependence on external variable for working capital is positive as expected. The strongest correlation is between InvSale and CCC. It may indicate that they almost measure the same aspect of external financial dependence for working capital.

4 Empirical results

We run four different set of regressions in this study. In our first set of regressions, our dependent variable is the stock returns between the end of December 2007 and March 2009. In our second and third set of regressions, our dependent variable is stock returns before the collapse of Lehman Brothers and after the collapse of Lehman Brothers. In the final set of regressions, we test our external finance dependence variables in a placebo environment.

4.1 Main specification

The stock returns between the end of December 2007 and March 2009 are examined for 194 non-financial firms that are traded publicly in ISE. In first four Columns of Table 3, financial dependency variables are entered into regression as only regressors. In these regressions, ExtInv has a positive and statistically insignificant coefficient. The sign of ExtInv is reverse of what we have expected. During a credit crunch, firms with a high dependence on external finance for investment should suffer more so coefficient of ExtInv should be negative. Positive sign of ExtInv can be interpreted in two ways: first during the crisis there is no credit crunch so ExtInv is not important or relevant for the performances of firms or our construct for ExtInv is not good enough and doesn't wholly capture firms' external dependence for investment. The latter can be a good explanation because ExtInv is a measure that evaluates firms' long-term external liquidity needs, so using 3 year data to construct ExtInv maybe isn't a good strategy. CCC has a negative but statistically insignificant coefficient. InvSale which has a high correlation with CCC (0.79) has also statistically insignificant negative coefficient like CCC. On the other hand, coefficient of DebtSale is negative and statistically significant at 1 percent level. The difference between dependence on external finance for working capital variables may be explained as follows: there is not a severe credit crunch in Turkey and firms can finance their working capital as long as they don't have balance sheet

problems. CCC and InvSale are solely proxies for external financial dependence for working capital, but DebtSale variable can also interpreted as a proxy for balance sheet problems in a firm. If DebtSale ratio is too high, firms may have difficulty in paying their debt and their non-performing loans can increase as a result. Therefore, banks may be more reluctant to lend to firms who have high liability to sales ratio especially during a crisis. When all financial vulnerability variables are entered into regression, all variables keep their former sign and their significance levels.

When exports ratio is added as a control variable, its coefficient is negative. Negative sign tell us that firms that have higher exports ratio were adversely affected during global crisis, as export demand in foreign countries fell. However, the coefficient is statistically insignificant. Next, we add Fama-French control variables and the momentum factor. Beta is negative and statistically significant at 5 percent level. Firms that are highly correlated with the market suffer more in the crisis as expected. Coefficient of firm size is negative whereas book to market value is positive and both of them are statistically insignificant. Tong and Wei (2010) find the reverse of these signs for firm size and Book/Market. Coefficient of momentum factor is also negative and statistically significant at 1 percent level. Tong and Wei (2010) also find a similar result as firms that have higher returns before the crisis are more adversely affected during the downturn of the market. In the end, we add the pre-crisis leverage ratio in the regression. Its coefficient is negative but insignificant. Negative sign can indicate that highly leveraged firms can find it difficult to refinance their debt. Therefore, their returns can be adversely affected.

4.2 Pre-Lehman and Post-Lehman returns

There is anecdotal evidence that the behavior of market is different before and after the bankruptcy of Lehman Brothers so we divide the period that is used in main regression into two parts. First we analyze the Pre-Lehman returns (returns from the end of December 2007 to the end of August 2008). In Pre-Lehman regressions, signs and significance of coefficients for ExtInv and CCC are same as whole period as it can be seen in Columns 1 and 2 of Table 4. In Columns 3 and 4 of Table 4, InvSale and DebtSale are negative and significant at 1 percent level. Significance of two financial dependency variables can indicate an environment of credit rationing. When all financial dependency variables are added into regression in Column 5, InvSale becomes insignificant and positive again whereas magnitude of DebtSale increases. Coefficient of Exports is negative and insignificant like whole period.

Beta is also negative and insignificant. Insignificance of Beta can suggest that there is not a strong downward trend in the market before Pre-Lehman period. Coefficients of Firm size, Book/Market and Momentum have reverse signs compared to whole period. Positive sign of Momentum can lead us to same conclusion as Beta. Leverage is also insignificant and negative like whole period. Column 8 of Table 3 suggest that in the Pre-Lehman period, the downward trend was not random and firms' dependence on external finance for working capital and debt significantly affected stock returns.

Our next dependent variable is Post-Lehman returns (returns from the end of August 2008 to the end of March 2008). In these regressions, all of our financial dependency variables are insignificant. Moreover signs of ExtInv, CCC and InvSale are positive. Only DebtSale keeps its negative sign. At first sight this can be interpreted as nonexistence of credit crunch in the economy. However a better explanation comes into play when all other control variables are entered into regression. Both Beta and Momentum is negative and statistically significant at 1 percent level. This may indicate that market entered into a frenzy sell after the bankruptcy of Lehman Brothers and firms that have a higher returns and are more correlated with the market decline most, so external financial dependence variables become less important. However further evidence is needed to support this conclusion.

4.3 The Effect of Financial Dependence Measures on Exporters

Results from the main regression for the whole period suggest that the debt to sale ratio is important in explaining the decline in returns while export ratio is not. In this section, we explore the case where the level of debt to sale ratio might be dependent on being an exporter. In other words, it could be the case that being an exporter causes firms to have higher debt to sale ratios. That might cause the coefficient of export ratio to become insignificant while debt to sale ratio is significant. In order to understand whether this is the case, we include an interaction term in the regression.

Table 6 shows the results. In first column, the coefficient of the interaction term (shown as DebtSale*Exports) is positive and statistically significant at 10 percent level. It indicates that when export ratio of a firm increases, the negative effect of DebtSale on returns decreases. It can be inferred that exporter firms are less vulnerable to financial dependency. Hence, we conclude that the main regression results were in the right direction. Moreover, when control variables are entered into the regression, the interaction term becomes insignif-

icant while debt to sale ratio is still significant.

4.4 Placebo test

In order to make sure that the financial dependency measures are meaningful during crisis periods we carry out a placebo test. Mainly, we pick a time period during which there was no crisis in the economy and run similar regressions to see whether any of our dependency measures were still significant. We use stock returns in 2007 as dependent variable as the Turkish economy expanded this year experiencing positive capital inflows. Therefore, theoretically, all financial dependency variables should be insignificant in this time period. Table 7 shows the results. As expected, all coefficients of financial dependence variables are insignificant. Moreover, ExtInv, InvSale and DebtSale have positive signs. Only coefficient of CCC is negative. This clearly indicates that there is no sign of credit supply constraint in 2007.

5 Conclusion

In this paper, we test the existence of a credit crunch in non-financial firms of Turkey during the crisis. Our hypothesis is that if a firm has a high dependency on external finance for investment and working capital, then during a credit crunch, this firm should be adversely affected and its stock prices should decline more. We use four proxies to measure dependency on external finance. ExtInv evaluates firms' external finance dependency for long-term liquidity needs and CCC, InvSale and DebtSale measure dependency on external finance for short-term liquidity needs. We also add various control variables to control for risks and demand contraction such as Fama-French three factors, ratio of exports in total sales, momentum factor and pre-crisis leverage.

ExtInv and CCC doesn't seem to affect stock returns during the crisis. InvSale is only negatively affect stock returns at 1 percent significance level between the beginning of downward rally of stock market until the beginning of the bankruptcy of Lehman Brothers when InvSale is the sole explanatory variable in the regression. DebtSale is most significant variable that negatively affect stock returns of firms. Firms with high short-term liability to total sales ratio adversely affected during the crisis. After the collapse of Lehman Brothers, stock returns of firms mostly driven by beta coefficient and momentum factor. Firms that

rally before the crisis and high correlation with market experience larger decline in stock returns.

Further research is needed to reach more conclusive results. In Turkey, some firms are affiliated with large corporations that have banks, so these firms can access bank credit more easily. Moreover, a number of firms also have easier access to foreign credit and have more diversified credit channels. The next step in our paper is to identify these firms and have interaction variables with financial dependency variables. A second step is to modify ExtInv variable to be become more comprehensive, at least five year data point should be used. The last step can be to add more control variables like number of shares traded over the number of shares outstanding to capture firms' stock price sensitivity to selling pressure in the stock market.

References

[1] Bates, Thomas W. and Kathleen M. Kahle and Rene M. Stulz, 2007. "Why do U.S. Firms Hold So Much More Cash Than They Used To?," NBER Working Paper No. 12534.

[2] Chari, V. V. and Lawrence J. Christiano and Patrick J. Kehoe, 2008. "Facts and myths about the financial crisis of 2008," Federal Reserve Bank of Minneapolis Working Papers 666.

[3] Fama, Eugene F. and Kenneth R. French, 1992. " The Cross-Section of Expected Stock Returns," Journal of Finance, American Finance Association, vol. 47(2), pages 427-65, June.

[4] Lakonishok, Josef and Andrei Shleifer and Robert W. Vishny, 1994. " Contrarian Investment, Extrapolation, and Risk," Journal of Finance, American Finance Association, vol. 49(5), pages 1541-78, December.

[5] Molina, Carlos A., 2005. "Are Firms Underleveraged? An Examination of the Effect of Leverage on Default Probabilities," Journal of Finance, American Finance Association, vol. 60(3), pages 1427-1459, 06.

[6] Raddatz, Claudio, 2006. "Liquidity needs and vulnerability to financial underdevelopment," Journal of Financial Economics, Elsevier, vol. 80(3), pages 677-722, June.

[7] Rajan, Raghuram G and Luigi Zingales, 1998. "Financial Dependence and Growth," American Economic Review, American Economic Association, vol. 88(3), pages 559-86, June.

[8] Tong, Hui and Shang-Jin Wei, 2010. "The Composition Matters: Capital Inflows and Liquidity Crunch during a Global Economic Crisis," Working Papers 172010, Hong Kong Institute for Monetary Research.

Table 1: Summary statistics

				Quantiles				
Variable	Obs	Mean	S.D.	Min	0.25	Mdn	0.75	Max
Returns	194	-0.45	0.29	-0.87	-0.62	-0.49	-0.35	1.22
ExtInv	194	-6.47	63.15	-869.03	-1.8	0.01	0.69	50.55
CCC	194	91.77	93.78	-154.39	35.04	78.55	135.96	819.69
InvSale	194	0.18	0.17	0	0.09	0.14	0.22	1.42
DebtSale	194	0.51	0.84	0	0.15	0.27	0.46	5.92
Exports	194	22.82	24.24	0	1.3	15.33	38.67	100
Beta	194	0.57	0.28	-0.35	0.43	0.6	0.74	1.14
Firm Size	194	11.94	1.6	9.05	10.68	11.83	12.98	17.15
Market/Book	194	1.88	2.14	-6.8	0.97	1.44	2.41	15.88
Momentum	194	0.11	0.58	-0.57	-0.12	0.01	0.16	5.37
Leverage	194	0.99	2.19	-11.19	0.37	0.67	1.55	18.79

Table 2: Correlation of variables

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) Returns	1										
(2) ExtInv	0.004	1									
(3) CCC	-0.057	0.019	1								
(4) InvSale	-0.091	0.09	0.789	1							
(5) DebtSale	-0.163	0.009	0.128	0.392	1						
(6) Exports	-0.085	0.044	0.058	0.155	-0.078	1					
(7) Beta	-0.133	0.013	0	-0.002	-0.17	-0.037	1				
(8) Firm Size	-0.023	0.017	-0.171	-0.286	-0.301	-0.093	0.224	1			
(9) Market/Book	0.019	0.034	-0.094	-0.116	-0.023	-0.162	-0.115	0.336	1		
(10) Momentum	-0.166	-0.004	0.029	0.14	0.321	-0.029	-0.126	-0.002	0.16	1	
(11) Leverage	-0.038	0.033	0.024	0.007	0.074	-0.013	-0.191	0.032	0.442	0.033	1

Table 3: The effect of liquidity crunch between January 2008 and March 2009

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ExtInv	2.01E-05				3.01E-05	3.49E-05	3.59E-05	4.30E-05
	(0.000)				(0.000)	(0.000)	(0.000)	(0.000)
CCC		-1.75E-04			-1.10E-04	-1.97E-04	-2.91E-04	-2.67E-04
		(0.000)			(0.000)	(0.000)	(0.000)	(0.000)
InvSale			-0.154		-0.002	0.079	0.142	0.133
			(0.100)		(0.231)	(0.251)	(0.248)	(0.252)
DebtSale				-0.057***	-0.055***	-0.063***	-0.067***	-0.065**
				(0.013)	(0.020)	(0.021)	(0.025)	(0.025)
Exports						-0.001	-0.001	-0.001
						(0.001)	(0.001)	(0.001)
Beta							-0.182**	-0.191***
							(0.070)	(0.069)
Firm Size							-0.009	-0.010
							(0.011)	(0.011)
Market/Book							0.002	0.007
							(0.011)	(0.011)
Momentum							-0.070***	-0.073***
							(0.023)	(0.024)
Leverage								-0.010
								(0.009)
Constant	-0.445***	-0.429***	-0.417***	-0.416***	-0.407***	-0.381***	-0.157	-0.142
	(0.021)	(0.035)	(0.030)	(0.024)	(0.034)	(0.045)	(0.163)	(0.160)
Observations	194	194	194	194	194	194	194	194
R-squared	0.000	0.003	0.008	0.027	0.028	0.038	0.088	0.092
Adjusted R-squared	-0.005	-0.002	0.003	0.022	0.007	0.012	0.043	0.042

Note: Dependent variable is stock returns adjusted for capital actions and dividends between the beginning of January 2008 and the end of March 2009. Heteroscedasticity consistent standard errors are in parentheses; *p<0.1, **p<0.05, ***p<0.01.

Table 4: The effect of liquidity crunch between January 2008 and August 2008

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ExtInv	1.78E-05				-1.53E-05	-8.75E-06	-8.43E-06	-6.13E-06
	(0.000)				(0.000)	(0.000)	(0.000)	(0.000)
CCC		-6.04E-04			-9.15E-04	-1.04E-03	-1.04E-03	-1.03E-03
		(0.000)			(0.001)	(0.001)	(0.001)	(0.001)
InvSale			-0.280***		0.288	0.399	0.420	0.417
			(0.080)		(0.413)	(0.484)	(0.472)	(0.480)
DebtSale				-0.078***	-0.088***	-0.099***	-0.108***	-0.107**
				(0.017)	(0.031)	(0.037)	(0.041)	(0.042)
Exports						-0.002	-0.002	-0.002
						(0.001)	(0.001)	(0.002)
Beta							-0.048	-0.051
							(0.067)	(0.069)
Firm Size							0.014	0.014
							(0.012)	(0.012)
Market/Book							-0.005	-0.003
							(0.013)	(0.016)
Momentum							0.056	0.055
							(0.033)	(0.035)
Leverage								-0.003
								(0.012)
Constant	-0.205***	-0.150*	-0.155***	-0.166***	-0.129*	-0.0938	-0.230	-0.225
	(0.029)	(0.060)	(0.038)	(0.033)	(0.052)	(0.076)	(0.173)	(0.169)
Observations	194	194	194	194	194	194	194	194
R-squared	0.000	0.020	0.014	0.026	0.045	0.055	0.064	0.064
Adjusted R-squared	-0.005	0.015	0.009	0.021	0.025	0.030	0.018	0.013

Note: Dependent variable is stock returns adjusted for capital actions and dividends between the beginning of January 2008 and the end of August 2009. Heteroscedasticity consistent standard errors are in parentheses; *p<0.1, **p<0.05, ***p<0.01.

Table 5: The effect of liquidity crunch between September 2008 and March 2009

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ExtInv	2.61E-05				2.36E-05	2.51E-05	3.70E-05	4.04E-05
	(0.000)				(0.000)	(0.000)	(0.000)	(0.000)
CCC		2.72E-04			3.14E-04	2.86E-04	1.85E-04	1.96E-04
		(0.000)			(0.000)	(0.000)	(0.000)	(0.000)
InvSale			0.098		-0.022	0.003	0.045	0.041
			(0.112)		(0.220)	(0.214)	(0.200)	(0.202)
DebtSale				-0.006	-0.009	-0.012	-0.014	-0.013
				(0.017)	(0.022)	(0.022)	(0.026)	(0.026)
Exports						0.000	-0.001	-0.001
						(0.001)	(0.001)	(0.001)
Beta							-0.174***	-0.178***
							(0.062)	(0.062)
Firm Size							-0.026*	-0.026**
							(0.013)	(0.013)
Market/Book							0.003	0.005
							(0.008)	(0.008)
Momentum							-0.109***	-0.111***
							(0.017)	(0.017)
Leverage								-0.005
								(0.005)
Constant	-0.289***	-0.314***	-0.307***	-0.286***	-0.309***	-0.301***	0.120	0.127
	(0.019)	(0.021)	(0.022)	(0.021)	(0.022)	(0.027)	(0.155)	(0.154)
Observations	194	194	194	194	194	194	194	194
R-squared	0.000	0.010	0.004	0.000	0.011	0.012	0.131	0.133
Adjusted R-squared	-0.005	0.005	-0.001	-0.005	-0.010	-0.014	0.089	0.085

Note: Dependent variable is stock returns adjusted for capital actions and dividends between the beginning of September 2008 and the end of March 2009. Heteroscedasticity consistent standard errors are in parentheses; *p<0.1, **p<0.05, ***p<0.01.

Table 6: Effect of exporters on financial dependence measures

	(1)	(2)	(3)	(4)	(5)	(6)
	Whole-Period	Whole-Period	Pre-Lehman	Pre-Lehman	Post-Lehman	Post-Lehman
DebtSale	-0.073***	-0.070***	-0.083***	-0.087***	-0.033**	-0.031
	(0.016)	(0.020)	(0.022)	(0.029)	(0.016)	0.022
DebtSale*Exports	0.001*	0.0012	1.47E-04	-1.11E-04	0.002	0.002**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	-0.001
Exports	-0.001*	-0.002*	-0.002	-0.001	-0.001	-0.002*
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	-0.001
Beta		-0.181***		-0.041		-0.161***
		(0.069)		(0.076)		-0.059
Firm Size		-0.010		0.014		-0.027*
		(0.011)		(0.011)		-0.014
Market/Book		0.008		-0.001		0.006
		(0.011)		(0.016)		-0.008
Momentum		-0.076***		0.059		-0.118***
		(0.024)		(0.037)		-0.02
Leverage		-0.011		-0.005		-0.005
		(0.008)		(0.010)		-0.005
Cosntant	-0.381***	-0.154	-0.130**	-0.266*	-0.266***	0.159
	(0.035)	(0.155)	(0.056)	(0.154)	(0.024)	(0.172)
N	194	194	194	194	194	194
R-sq	0.040	0.093	0.034	0.044	0.016	0.139
adj R-sq	0.025	0.053	0.019	0.003	0.000	0.101

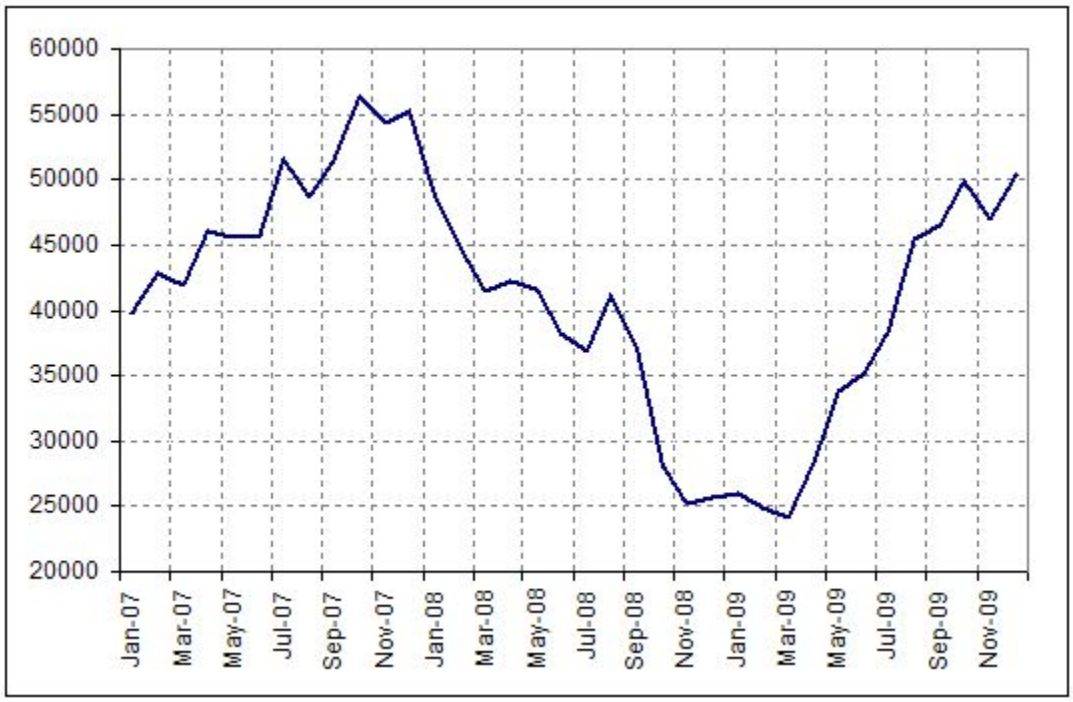
Note: In columns 1 and 2, dependent variables are stock returns adjusted for capital actions and dividends between the beginning of January 2008 and the end of March 2009. In columns 3 and 4, dependent variables are stock returns adjusted for capital actions and dividends between the beginning of January 2008 and the end of August 2009. In columns 5 and 6, dependent variables are stock returns adjusted for capital actions and dividends between the beginning of September 2009 and the end of March 2009. Heteroscedasticity consistent standard errors are in parentheses; *p<0.1, **p<0.05, ***p<0.01.

Table 7: Testing financial dependency variables in a period without crisis

	(1)	(2)	(3)	(4)	(5)
ExtInv	9.62E-05				-6.30E-06
	(0.000)				(0.000)
CCC		-2.78E-04			-1.10E-03
		(0.000)			(0.001)
InvSale			0.175		0.522
			(0.220)		(0.478)
DebtSale				0.095	0.069
				(0.071)	(0.084)
Constant	0.312***	0.337***	0.279***	0.263***	0.283***
	(0.041)	(0.050)	(0.054)	(0.051)	(0.056)
Observations	194	194	194	194	194
R-squared	0.000	0.002	0.003	0.020	0.031
Adjusted R-squared	-0.005	-0.003	-0.002	0.014	0.010

Note: Dependent variables are stock returns adjusted for capital actions and dividends between the beginning of January 2007 and the end of December 2007. Heteroscedasticity consistent standard errors are in parentheses; *p<0.1, **p<0.05, ***p<0.01.

Figure 1: Istanbul Stock Exchange National 100 Index



Source: Istanbul Stock Exchange.