Market Reaction to U.S. Debt Crisis

An Event Study of the U.S. Debt Crisis and Credit Rating Downgrade in 2011, Focusing on Government Suppliers and Bailout Recipients

Bachelor Thesis in Finance
Spring 2013

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Abstract: This thesis investigates the implications of the U.S. debt crisis in 2011 and the historic downgrade of the U.S. government credit rating resulting from it. The thesis examines the reactions of 19 different sectors in terms of mean cumulative abnormal returns, calculated according to the market model. Furthermore, cumulative abnormal returns are explained by suppliers of government and government bailout recipients in multivariate regression analyses. Our study shows that several sectors were significantly affected by the event. From the multivariate regressions it is also possible to identify a negative and significant relationship between performance during a sovereign credit crisis and firms classified as government suppliers or bailout recipients, all other things being equal.

Acknowledgements: We would like to thank our tutor, Laurent Bach, for guidance and valuable insights.

Keywords: Event Study, Sovereign Credit Rating Downgrade, Government Suppliers, Bailout Recipients

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1. Introduction

On August 5, 2011, credit rating agency Standard & Poor's downgraded the credit rating of the U.S. government bond for the first time in history (from AAA to AA+). Signs of structural debt problems of the U.S. government were already addressed on April 18, 2011, when S&P announced a negative outlook on their credit rating. The related U.S. debt-ceiling crisis was the genesis of the downgrading. During this crisis the U.S. Congress failed to find a sufficiently quick solution on how to solve the problem of national debt rising to its limit.

Ultimately, on July 31, U.S. Congress reached an agreement on how to solve the crisis. The immediate short-term effect of the settlement was to raise the debt ceiling (from USD 14.3 trillion to USD 16.4 trillion). The long-term part of the agreement was to substantially reduce future government spending in order to manage escalating debt levels[1]. This agreement was signed and accepted by president Barack Obama on August 2. However, the turmoil, caused by the uncertainty if USA would fulfill its financial obligations, posed a substantial reason why S&P decided to downgrade[2].

The credit rating downgrade was a hot topic discussed in international public media. While the debate was very much limited to speculation of whether a downgrade event would occur or not, less attention was devoted to how and why markets would react to a downgrade. One of the reasons why the discussion lacked analysis on the consequences in terms of financial performance was because this event was unique in history. Never before has the government of USA been downgraded and therefore predictions based on past events could not be made.

To fill this existing gap we have made an event study on the downgrading and the preceding debt-crisis (henceforth called "event"), and examined the effects on sectors traded on New York Stock Exchange (NYSE), American Stock Exchange (AMEX) and National Association of Securities Dealers Automated Quotations (NASDAQ). We want to study how markets and industries reacted to the event. We examine the reactions of 19 different sectors, and then continue the study by exploring if government suppliers or government bailout recipients are predictive of cumulative abnormal returns (henceforth "CARs") during a government debt crisis.

[1] http://www.bloomberg.com/news/2011-08-01/obama-debt-cap-deal-with-congress-leaders-avoids-default-vote-due-today.html (2013-05-11)
[2] Please see Quotation I in Appendix for full comment by Standard and Poor's.

We quantify the effect by estimating CARs during an initial event window of +/- 24 trading days (henceforth "days"), which is approximately 5 weeks before and after the downgrading. To expand our analysis we also look at three more event windows (+/- 10, +/- 3 and +/- 1 days). The purpose of longer event windows is to, bar downgrading, capture Congress turmoil. The shorter windows narrow down the sole downgrading. The results during event windows +/- 1 and +/- 3 days are thus attributable to the downgrading announcement, as the debt crisis had already been solved by then.

Figure A shows cumulative returns for a value-weighted index (AMEX, NYSE, NASDAQ and ARCA) during the event. The event day (Day 0) represents the downgrading.

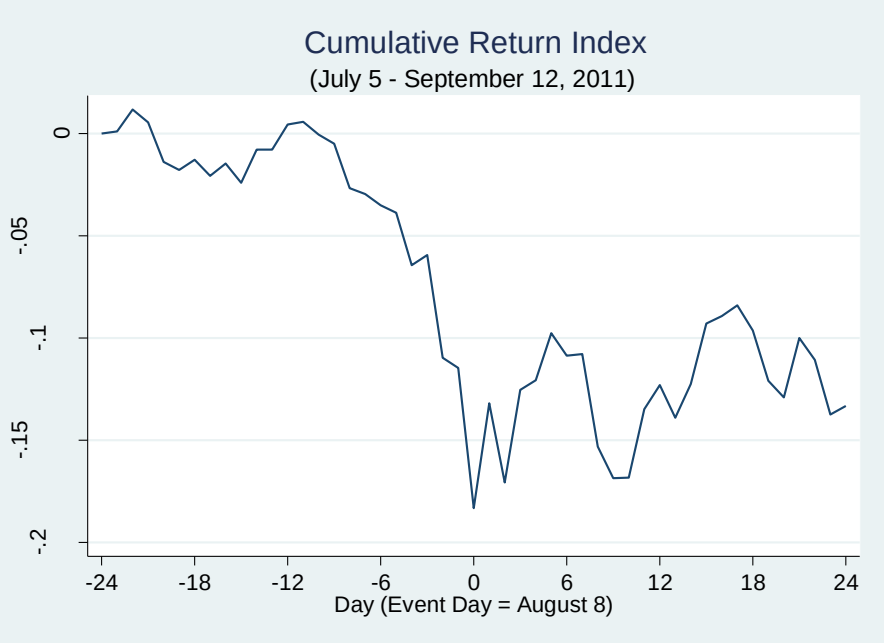


Figure A. The graph shows that the index cumulative return dropped with almost 20% during the first 24 days.

We conduct our analysis by estimating beta values during an estimation window of -172 to -24 (148 days) days before the downgrading. These beta values are used during the event windows to calculate expected returns according to the market model. Actual return is subtracted from expected return for abnormal return calculations. Abnormal returns are later summed during the event windows in order to get CARs. Individual company CARs are later aggregated on industry level according to the North American Classification System (NAICS), generating

mean cumulative abnormal returns (henceforth "MCARs"). Statistical significance of MCARs is tested on industry level for different event windows.

The second part of our study is to explain CARs on firm level. This is conducted by multivariate regressions explaining CARs on government suppliers, government bailout recipients and control variables. Our results support the fact that government suppliers perform significantly worse than non-suppliers. Furthermore, we find that bailout recipients display significantly worse results than non-recipients. The economic intuition behind these findings is the anticipation of US Government possessing smaller funds for future spending, such as employing suppliers or aiding financially distressed firms. This is due to the higher yield rate associated with credit rating downgrades and planned future cost cuts by the Congress in order to handle the growing debt[3]. These two company classifications are interesting to study as they both, in great extent, depend on the government. Government suppliers are continuously receiving revenue from the government. Thus, saving cuts will have an instantaneous impact on revenues. Bailout recipients will not be instantaneously affected unless a company is currently in need for financial aid. For these companies it is more likely that the consequences from saving cuts will occur in the future, if new bailout needs would arise. The weakened probability of receiving aid, attributable to future government cost cuts, should however be reflected today as the value of a company equals the present value of its future cash flows.

This study is interesting because financial markets are integrated, and managed funds allocate resources internationally, today. Moreover, sovereign risk is one of many risks when investing in foreign markets. USA is currently the world's leading economy and a sovereign downgrade is thus interesting for both private and professional investment purposes. Furthermore, what makes this paper unique is that we investigate sector reactions and the performance of government suppliers and bailout recipients.

It is plausible that a similar downgrading threat will take place in the future. For example, a smaller debt-ceiling crisis took place in January 2013[4]. This crisis was not severe enough to cause substantial consequences like the one in 2011. However, the very event of another debt crisis implies that a future severe crisis resulting in a credit downgrade is not implausible. It is therefore of interest for investors to possess information on market reactions if

[3] Please see "Previous Literature" (Packer, 1996)
[4] http://www.nytimes.com/2013/01/15/us/politics/obama-to-press-house-gop-on-debt-limit.html?_r=0 (2013-05-11)

a severe debt crisis would occur in the future.

2. Previous Literature

Packer (1996) has studied the determinants of sovereign credit ratings. He concludes that per capita income, GDP growth, inflation, external debt, level of economic development, and default history determine a country's credit rating. Packer also concludes that credit rating downgrades significantly increase the yield level of sovereign debt.

How markets can react to credit rating information is explained by the three different efficient market hypotheses (EMH). The weak form of the EMH claims that all past information is already incorporated in stock prices. Credit rating announcement can thus affect stock prices. According to the semi-strong form of the EMH, prices reflect all publicly traded information and instantly adjust to new information. This implies that if credit rating agencies add informational value, credit rating announcements should have an impact on national stock markets. The strong form of the EMH claims that even hidden or insider information is incorporated in stock prices. Thus, announcements about credit rating changes cannot affect stock prices.

Previous studies have focused the debate on the relationship between corporate credit rating downgrades and stock prices. The earlier studies made on this relationship indicate that credit rating changes do not affect stock prices. Weinstein (1977), Pinches and Singleton (1978) and Wakeman (1978) support these findings.

More recent studies on the topic of corporate downgrades and stock performance yield different results. Like earlier literature, later studies have found that an upgrade of corporate ratings has, on average, no effect on stock price. The difference between earlier and later literature is that more recent papers support the conclusion that a downgrade of corporate bond has a negative effect on share price. This finding is supported by Cornell, Landsman, Shapiro (1989), Griffin and Sanvicente (1982) and Holthausen, Leftwich (1986).

The relationship between sovereign rating changes and national stock markets is less extensively covered than the relationship between corporate rating changes and share prices. Some of the previous research on sovereign credit rating changes' effect on national stock markets has, however, been made by Faff, Brooks, Hillier (2001) and Elayan, Rose, Pukthuanthog (2007). Similar to the more recent cluster of corporate rating studies described

earlier, they conclude that sovereign downgrades affect national stock prices negatively, meanwhile upgrades, on average, do not. Faff, Brooks, Hillier (2001) also conclude that only sovereign downgrades by Standard & Poor's and Fitch affect national stock markets significantly.

Moreover, previous literature has focused on a specific event window that captures the individual effect of a downgrade. According to Holthausen and Leftwich (1986) this event window equals +/- 1 days.

Furthermore, Bissondooyal and Brooks (2008) examine different financial models when estimating financial performance of companies during a sovereign credit downgrade. In their study, they test the market model, quadratic model, downside model, and the higher order downside model. They conclude that the market and downside model generate significant results on downgrades. They also conclude that both methods are valid for abnormal return calculations. Moreover, the quadratic and higher order downside model do not generate results in line with previous literature, as they also result in significant abnormal returns on upgrades.

3. Data and Methodology

3.1 Data

The data used in this thesis is downloaded from Wharton Research Data Services (WRDS), Federal Procurement Data System (FPDS) and ProPublica. To present an overview of the data, we have divided it into four groups: *Estimation Data*, *Event Data*, *Fundamental Data* and *Government Data*. These are all described below in more detail.

Estimation Data – This data is collected from CRSP/Annual Update/Stock/Security Files/Daily Stock File. The data sheet includes the following variables: cusip-codes, company names, share codes, exchange codes, North American Industry Classification System (NAICS) codes, daily holding period return for each company, and daily value-weighted returns including distributions of NYSE/AMEX/NASDAQ and ARCA. The data spans from December 1, 2010 to July 1, 2011, which equals our estimation window of 7 months (148 trading days). The file is then merged with a csv-file containing the name of each

sector connected to the first two numbers in the six-digit NAICS-code. Please see table I for sector names and codes.

1. Agriculture, Forestry, Fishing and Hunting (11)
2. Mining, Quarrying, and Oil and Gas Extraction (21)
3. Utilities (22)
4. Construction (23)
5. Manufacturing (31, 32, 33)
6. Wholesale Trade (42)
7. Retail Trade (44, 45)
8. Transportation and Warehousing (47, 48, 49)
9. Information (51)
10. Finance and Insurance (52)
11. Real Estate and Rental and Leasing (53)
12. Professional, Scientific, and Technical Services (54)
13. Management of Companies and Enterprises (55)
14. Administrative and Support and Waste Management and Remediation Services (56)
15. Educational Services (61)
16. Health Care and Social Assistance (62)
17. Arts, Entertainment, and Recreation (71)
18. Accommodation and Food Services (72)
19. Other Services (except Public Administration) (81)

Table I. NAICS codes are in the parentheses.

Our analysis is conducted using common stocks traded on NYSE, NASDAQ or AMEX. Hence, only companies with the share code "11" and "12" traded on the relevant stock exchanges are used. The last step in the data cleaning process is that all companies with missing information in any of the days within the 148 trading days are dropped. Furthermore, beta and alpha values are calculated using OLS regressions, where each company's holding period return is regressed on the value-weighted index return including distributions. (Please see "Methodology").

Event Data - This data is also collected from CRSP/Annual Update/Stock/Security Files/Daily Stock File. The file includes the same variables as mentioned above, but the data covers a different time interval. This time the data spans from July 5, 2011 to September 12, 2011, which implies an event window of 49 (+/- 24) trading days.

To identify NAICS sectors, the event data file is merged with the file containing the sector names. Finally, cumulative abnormal returns are calculated for each sector using the beta values from the estimation data.

Fundamental Data – This data is collected from CRSP/Annual Update/CRSP/Compustat Merged/Fundamentals Annually. It contains information about cusip-codes, total assets, total long-term debt, annual fiscal closing price and book value per share for each company. The data is collected from the year before the event (January 2010 – December 2010). The fundamental data is used to generate control variables for the multivariate regressions. The control variables are size, leverage, market-to-book value, volatility, and past returns. Past returns equal the mean holding period returns for each company during the estimation window. The volatility is the standard deviation of the daily holding period returns during that window. To make the interpretation easier in the regressions, the past return variable is multiplied by 100. The size variable is the natural logarithm of each company's total assets (book values). The leverage variable is calculated as "total long-term debt"/"total assets" and market-to-book value is calculated as "annual fiscal closing price"/"book value per share".

Government Data – This data is collected from ProPublica and Federal Procurement Data System. A list of the top 100 contractors to the federal government of the United States is downloaded. The file is merged by cusip-codes with our data sample, and a dummy variable is created taking the value 1 if the company is a supplier to the government, and 0 if the company is not.

Furthermore, information about companies classified as "bailout recipients" is collected from ProPublica, an independent non-profit organization that conducts investigative journalism in the public interest. The list used in this thesis was made to present the distribution of tax money in terms of government bailouts. We have used all the companies on this list with a total of outgoing bailout funds of USD 100 MLN or more. The information is merged with our data sample and a dummy variable is created in the same way as described for the government suppliers.

3.2 Potential Selection Bias

The greatest problem in this thesis is in many ways the number of companies analyzed. First of all, the number of companies on the targeted sectors varies a lot. For example, the NAICS-

codes also include a sector called "Public Administration", but in this thesis that sector is dropped due to the fact that only one company in our data sample was classified to it. Additionally, due to lack of return data for each and every firm during both the estimation and the event window, many firms are dropped. If the number of companies in one sector is limited, missing companies have a greater effect on the sector's MCARs. Moreover, the dropped firms could also have been classified as government suppliers or bailout recipients, which would have affected our regression results.

The limited list of "suppliers" and "recipients" results in another bias. We only study the largest suppliers and the largest bailout companies, rather than all firms. The bias goes to the characteristics of larger companies. Although one big firm effect (size) is controlled for in our regressions, there may still be characteristics of big firms left in our data, and thus pose a bias.

Furthermore, as a result of our data cleaning and use of only common stocks traded on NYSE, NASDAQ or AMEX, only 35 of the 100 top contractors to the federal government of the United States can be used in our analysis. There are some other explanations, than only our data cleaning, for the drop in companies. For instance, both groups *and* subsidiaries are on the top 100 supplier list (e.g. "Lockheed Martin Corporation" *and* "Lockheed Missiles and Space Company". In this case only "Lockheed Martin Corporation" is in our data sample). Also, there might be firms on the top 100 list traded on other stock exchanges, in America or internationally.

Regarding the list of bailout recipients, there were 59 of 116 companies that matched our data sample. The common stock "limitation" resulted in many firms that could not be matched to our sample (e.g. investment funds).

To sum up, the government suppliers and the bailout recipients are very few and not evenly spread over the sectors. This eliminates the opportunity for us to study their effects by industry. Also, when studying MCARs of industries, mean values can be less reliable as a result of the different number of companies in each sector (e.g. "Agriculture, Forestry, Fishing and Hunting" vs. "Manufacturing"). Table II shows the total number of firms, as well as government suppliers and bailout recipients, in each sector.

Sector	Number of Firms	Number of Government Suppliers	%	Number of Bailout Recipients	%
Agriculture, Forestry, Fishing and Hunting	10	-	-	-	-
Mining, Quarrying, and Oil and Gas Extraction	206	-	-	-	-
Utilities	97	-	-	-	-
Construction	38	1	3%	-	-
Manufacturing	1380	17	49%	1	2%
Wholesale Trade	71	1	3%	-	-
Retail Trade	171	1	3%	-	-
Transportation and Warehousing	103	2	6%	-	-
Information	271	1	3%	-	-
Finance and Insurance	589	2	6%	48	81%
Real Estate and Rental and Leasing	48	-	-	-	-
Professional, Scientific, and Technical Services	219	9	26%	-	-
Management of Companies and Enterprises	113	-	-	10	17%
Administrative and Support etc.	67	1	3%	-	-
Educational Services	19	-	-	-	-
Health Care and Social Assistance	58	-	-	-	-
Arts, Entertainment, and Recreation	32	-	-	-	-
Accommodation and Food Services	55	-	-	-	-
Other Services (except Public Administration)	15	-	-	-	-
Total	3562	35	100%	59	100%

Table II. The percentage columns represent the relative distribution of government suppliers and bailout recipients.

3.3 Methodology

The conducted methodology in this thesis is an event study where initially the developments of MCARs are examined on sector level. Secondly, CARs are also analyzed on firm level. In this part, CARs are explained on government suppliers and bailout recipients through multivariate regression analysis.

3.3.1 Calculation of Cumulative Abnormal Returns

In line with earlier research mentioned in "Previous Literature", cumulative abnormal returns are calculated according to the market model. We believe this model is fair to use given the findings of Bissondooyal and Brooks (2008). Initially alpha and beta values are estimated in the estimation window, reaching from December 1, 2010 to July 1, 2011. The alpha and beta values are estimated by regressing daily holding period returns (adjusted for dividends, stock splits etc.) on daily index returns, as beta is a measurement of systematic risk and thus how a stock moves in relation to the market:

$$R_{i\tau} = \alpha_i + \beta_i R_{m\tau} + \varepsilon_{i\tau}$$

(Equation 1)

$R_{m\tau}$ is the value-weighted market return including distributions of NYSE, NASDAQ, AMEX and ARCA. $E(\varepsilon_{i\tau})$ is assumed to be zero. The regression generates $\hat{\alpha}$ and $\hat{\beta}$, which are used to predict expected returns $E(R_{i\tau}|R_{m\tau})$.

$$E(R_{i\tau}|R_{m\tau}) = \hat{\alpha}_i + \hat{\beta}_i R_{m\tau}$$

(Equation 2)

Abnormal returns are calculated as realized returns less expected returns, that is:

$$AR_{i\tau} = R_{i\tau} - \hat{\alpha}_i - \hat{\beta}_i R_{m\tau}$$

(Equation 3)

In the last equation, $R_{i\tau}$ and $R_{m\tau}$ are the returns during the event window reaching from July 5, 2011 to September 12, 2011.

Finally, CARs for each stock are calculated as the sum of abnormal returns in the relevant event window. MCARs are then created by sector taking the average of all firms' daily CARs within each sector. The MCARs (of the last event day, in each window) are presented sector wise in table IV and in the Figures (please see "Appendix"). In the multivariate regression analysis, CARs are used as the dependent variable.

3.3.2 Multivariate Regression Model

The following four OLS regressions were conducted to study the relationship between CARs, government suppliers, and bailout recipients during the different event windows. The idea is to investigate if these two independent variables can explain the CARs during the event. We control for both firm and stock characteristics, but use different control variables in each regression. In the last regression we also control for sector specific fixed effects.

$$CAR_{i\tau} = \alpha_\tau + \beta_{1\tau} contractor\_dummy_{i\tau} + \beta_{2\tau} bailout\_dummy_{i\tau} + \varepsilon_{i\tau} \text{ where } \tau = 1,2,3,4$$

(Equation 4)

$$CAR_{i\tau} = \alpha_\tau + \beta_{1\tau} contractor\_dummy_{i\tau} + \beta_{2\tau} bailout\_dummy_{i\tau} + \beta_{3\tau} size_{i\tau} + \varepsilon_{i\tau} \text{ where } \tau = 1,2,3,4$$

(Equation 5)

$$CAR_{i\tau} = \alpha_\tau + \beta_{1\tau} contractor\_dummy_{i\tau} + \beta_{2\tau} bailout\_dummy_{i\tau} + \beta_{3\tau} size_{i\tau} + \beta_{4\tau} mkt\_to\_book_{i\tau} + \beta_{5\tau} leverage_{i\tau} + \beta_{6\tau} volatility_{i\tau} + \beta_{7\tau} past\_returns_{i\tau} + \varepsilon_{i\tau} \text{ where } \tau = 1,2,3,4$$

(Equation 6)

$$CAR_{i\tau} = \alpha_\tau + \beta_{1\tau} contractor\_dummy_{i\tau} + \beta_{2\tau} bailout\_dummy_{i\tau} + \beta_{3\tau} size_{i\tau} + \beta_{4\tau} mkt\_to\_book_{i\tau} + \beta_{5\tau} leverage_{i\tau} + \beta_{6\tau} volatility_{i\tau} + \beta_{7\tau} past\_returns_{i\tau} + \beta_{8\tau}\delta_{2i\tau} + \cdots + \beta_{25\tau}\delta_{19i\tau} + \varepsilon_{i\tau} \text{ where } \tau = 1,2,3,4$$

(Equation 7)

The *contractor_dummy* takes the value 1 if a firm is a government supplier (otherwise 0) and the *bailout_dummy* takes the value 1 if a firm has received bailout funds from the government (otherwise 0). *Size, mkt_to_book* and *leverage* are all firm specific variables (firm size, firm market-to-book value and leverage). *Volatility* and *past_returns* are estimated for each and every stock during the estimation window. $\varepsilon_{i\tau}$ represents the error term, where *i* stands for the observation and τ stands for the event window. We do one regression for each event window, hence $\tau = 1,2,3,4$. Please see the "Data" section and table III for data information and data construction, respectively.

All regressions are performed using robust standard errors. The control variables are used to adjust for bias (please see the correlation matrix in table VI). In the first regression, CARs are only regressed on the contractor and bailout dummies. In the second regression, the control variable size is also included, as this variable shows the highest correlation with the two dummy variables. In the third regression, all control variables are included. In the final regression, we include all control variables and adjust for industry fixed effects. Hence, we add industry dummies (δ) in the regressions (please see "Equation 7"). Since there are 19 sectors in our data set, 18 new dummy variables are generated to avoid perfect multicollinearity.

The intention with controlling for industry fixed effects is to reduce sector related bias. Furthermore, the purpose of including market-to-book value and leverage in the regression is to adjust for bias linked to current firm values and capital structure. Finally, by controlling for volatility and past returns we get rid of bias associated with earlier performance and stock development. Thus, we can focus on the returns during the event window, limiting the bias of previous development.

4. Results

The U.S. debt ceiling crisis and the following credit rating downgrade resulted in a market-wide shock affecting several industries significantly.

Table IV presents an overview of MCARs by industry for all event windows. The amount of companies showing negative MCARs increases from the longest to the shortest event window (i.e. from +/- 24 to +/- 1 days). The number of industries displaying significant MCARs also increases as the event windows get smaller. Table V presents descriptive statistics of table IV displaying max, average, min, and standard deviation, aggregated for all industries.

Figure A displays the evolution of cumulative returns (CR) for a value-weighted index during the +/-24 days event window. The largest reaction is noticed from day - 12 to day 0 (event day) where index declines sharply.

Figure A is followed by industry figures. The industry figures portray the evolution of MCARs for all industries during the event window +/-24 days. Depending on industry, there are different trends to be noticed. Some industries ("Accommodation and Food Services", "Manufacturing", "Information", "Real Estate and Rental and Leasing", "Professional, Scientific, and Technical Services", "Other Services (Except Public Administration)" and "Health Care and Social Assistance") display a steady negative trend from day -24 to day 24. Most of these industries show sharper negative MCARs around the downgrading.

Another group of industries ("Construction", "Educational Services", "Wholesale Trade", "Retail Trade", "Transportation and Warehousing", "Finance and Insurance", "Management of Companies and Enterprises", "Arts, Entertainment, and Recreation") do not display a clear upward or downward trend before the downgrading. Around the downgrading

these industries decline. After the decline, evolution of MCAR is similar to that before the decline. These are the characteristics of the two distinctive groups that display negative trends during the +/- 24 event window.

We can also find a trend among industries performing positively in terms of MCARs during the event window +/- 24 days ("Agriculture, Forestry, Fishing and Hunting", "Mining, Quarrying, and Oil and Gas Extraction", "Utilities", "Administrative and Support and Waste Management and Remediation Services"). Although these industries in total displayed positive reactions, they declined around downgrading. The drop around the downgrading is also earlier implied by Table IV, which only displays one industry ("Utilities") with positive MCARs during the event window of +/-1 days. Among the industries with positive MCARs during the +/- 24 days event window, "Administrative and Support and Waste Management and Remediation Services" seems to be mostly affected by the downgrade itself.

Table VI is a correlation matrix between the dependent variables explaining CARs in the multivariate regressions. Being a government supplier is substantially correlated with firm size. Government bailout recipients also display a serious relationship with firm size.

4.1 Multivariate Regression Analysis

The second part of the results section explains CARs with government suppliers and government bailout recipients. This is conducted by multivariate regressions displayed in Table VII-VIII. In these regressions, CARs of all individual companies across all sectors are used as dependent variables. Table VII (VIII) shows the regressions for the event windows +/- 24 days and +/- 10 days (+/- 3 and +/- 1 days).

Furthermore, there are four regressions per event window. Regression 1 explains CARs on government suppliers and government bailout recipients. Regression 2 in addition to regression 1 includes size as control variable. Regression 3 in addition to regression 2 adds market-to-book, past returns, volatility and leverage as control variables. Regression 4 has the same dependent and independent variables as regression 3, but also controls for industry fixed effects. A summary (including significance by event window and coefficients) of the results from the four different regressions are going to be presented one by one below. Please see table VII-VIII in "Appendix" for more details.

4.1.1 Regression 1

During the event window +/- 24 days, we find that bailout recipients are not statistically significant (at the 10% level). However, for event windows +/- 10 , +/- 3 and +/- 1 days we get significant results (at the 5%, 1% and 10% level, respectively). Additionally, from Figure B we can see that the effect of having received bailout funds is largest during the event window +/- 3 days.

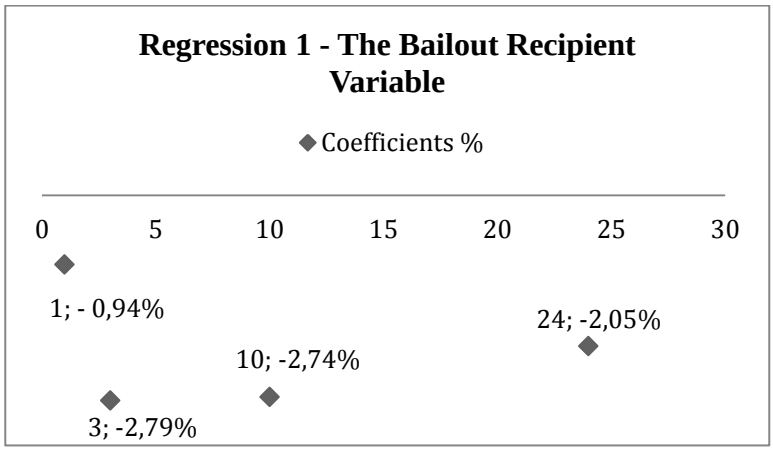


Figure B. The graph is based on Regression Table VII-VIII. It plots the coefficient in % for each of the four event windows. The windows are displayed on the x-axis: +/- 1 days = 1, +/- 3 days = 3, +/- 10 days = 10 and +/- 24 days = 24. The plotted values show how bailout recipients performed relative to non-recipients in terms of CARs expressed in %.

Moving on to the "Government Suppliers" in regression 1, we can see that they are statistically significant (at the 1% level) during the event window +/- 24 days. For the event window +/- 10 days we also get a significant result (at the 10% level). However, the coefficients are not significant during the event windows +/- 3 or +/- 1 days (at the 10% level). Moreover, from Figure C we can see that the effect of being a government supplier is largest in the longest event window of +/- 24 days.

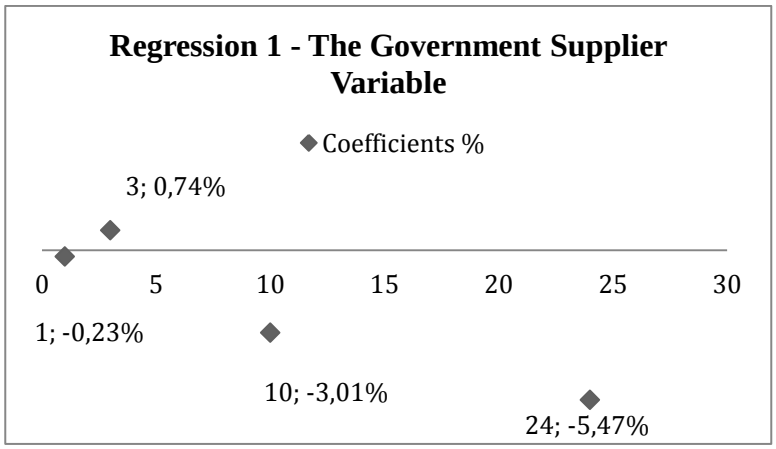


Figure C. The graph is based on Regression Table VII-VIII. It plots the coefficient in % for each of the four event windows. The windows are displayed on the x-axis :+/- 1 days = 1, +/- 3 days = 3, +/- 10 days = 10 and +/- 24 days = 24. The plotted values show how government suppliers performed relative to non-suppliers in terms of CARs expressed in %.

4.1.2 Regression 2

During the event window +/- 24 days, we find that bailout recipients are not statistically significant (at the 10% level.) However, during all of the other event windows, all results are significant (at the 1% level). Furthermore, from Figure D one can see that the effect of being a bailout recipient is largest during the event window +/- 3 days.

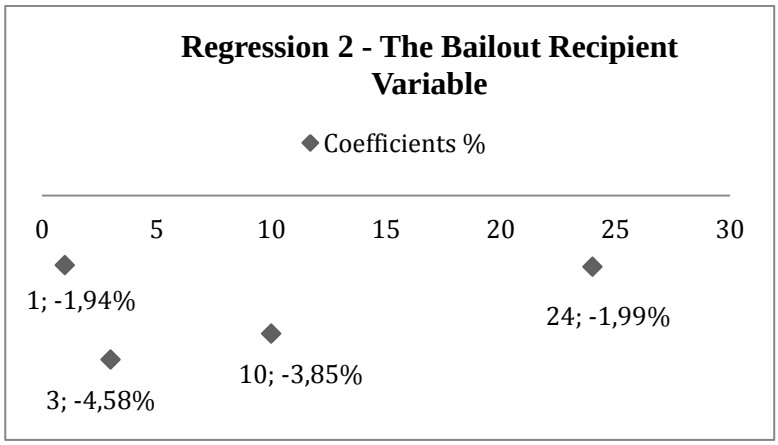


Figure D. The graph is based on Regression Table VII-VIII. It plots the coefficient in % for each of the four event windows. The windows are displayed on the x-axis :+/- 1 days = 1, +/- 3 days = 3, +/- 10 days = 10 and +/- 24 days = 24. The plotted values show how bailout recipients performed relative to non-recipients in terms of CARs expressed in %.

Regarding the "Government Suppliers" in regression 2 we can see that they are significant during both of the long-term event windows; +/- 24 and +/- 10 days (at the 1% and 5% level, respectively). The dummy variable is not significant (at the 10% level) for the event window +/- 3 days. In the shortest event window, we can find a significant result (at the 5% level). Moreover, from Figure E we can see that the effect of being a supplier to the government is largest in the longest event window (+/- 24 days).

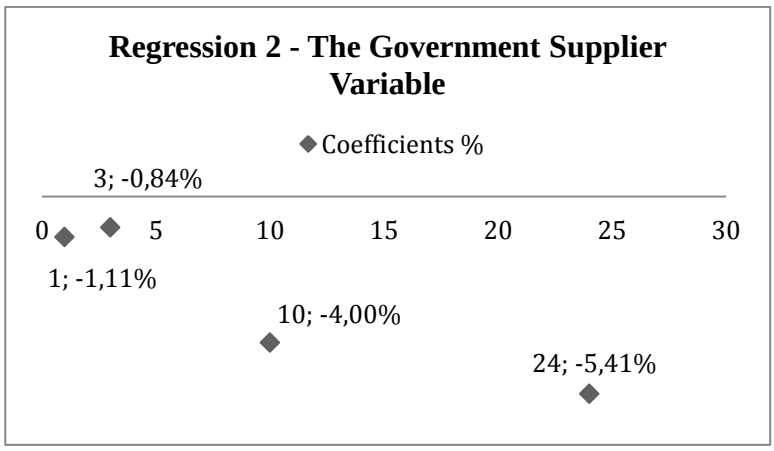


Figure E. The graph is based on Regression Table VII-VIII. It plots the coefficient in % for each of the four event windows. The windows are displayed on the x-axis :+/- 1 days = 1, +/- 3 days = 3, +/- 10 days = 10 and +/- 24 days = 24. The plotted values show how government suppliers performed relative to non-suppliers in terms of CARs expressed in %.

4.1.3 Regression 3

Now, when we include the full set of control variables, bailout recipients are significant during all event windows (at the 10% level during the event window +/- 24 days, and at the 1% level during all of the other event windows). Bailout recipients perform worse than non-recipients during all event windows and the effect is largest during the +/- 3 days event window. Please see Figure F.

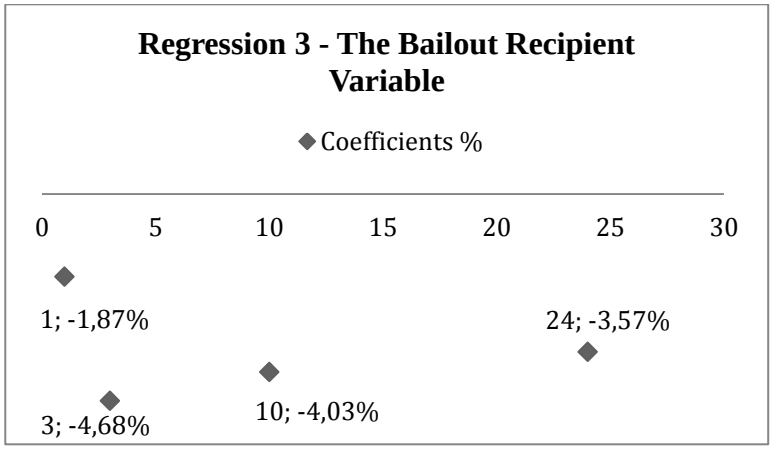


Figure F. The graph is based on Regression Table VII-VIII. It plots the coefficient in % for each of the four event windows. The windows are displayed on the x-axis :+/- 1 days = 1, +/- 3 days = 3, +/- 10 days = 10 and +/- 24 days = 24. The plotted values show how bailout recipients performed relative to non-recipients in terms of CARs expressed in %.

Moreover, the "Government Supplier" variable is statistically significant in explaining CARs during all event windows except the +/- 3 days event window (at the 1% level during event windows +/- 24 and +/- 1 days, and at the 5% level during the +/- 10 days event window). The effect of being a government supplier is largest during the +/- 24 days event window (please see Figure G).

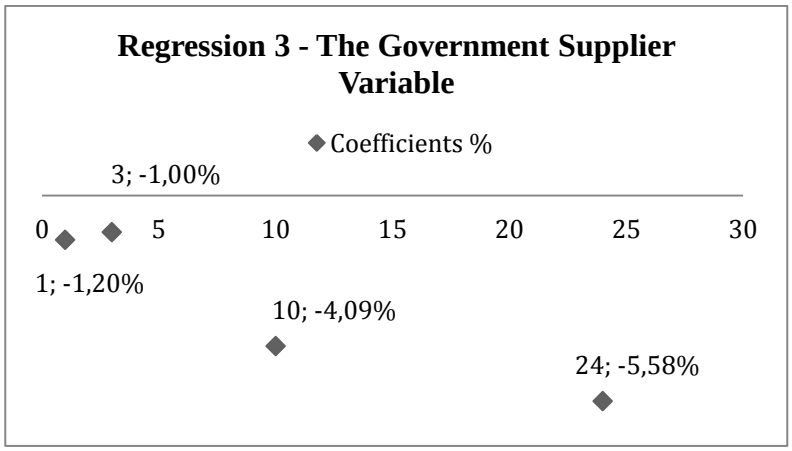


Figure G. The graph is based on Regression Table VII-VIII. It plots the coefficient in % for each of the four event windows. The windows are displayed on the x-axis :+/- 1 days = 1, +/- 3 days = 3, +/- 10 days = 10 and +/- 24 days = 24. The plotted values show how government suppliers performed relative to non-suppliers in terms of CARs expressed in %.

4.1.4 Regression 4

Bailout recipients are statistically significant during all event windows (at the 1% level) except during the +/- 24 days event window. The effect of being a bailout recipient is largest during the +/- 10 days event window (please see Figure H). In this case, companies that have received bailout funds, dropped on average 5% more compared to non-recipients.

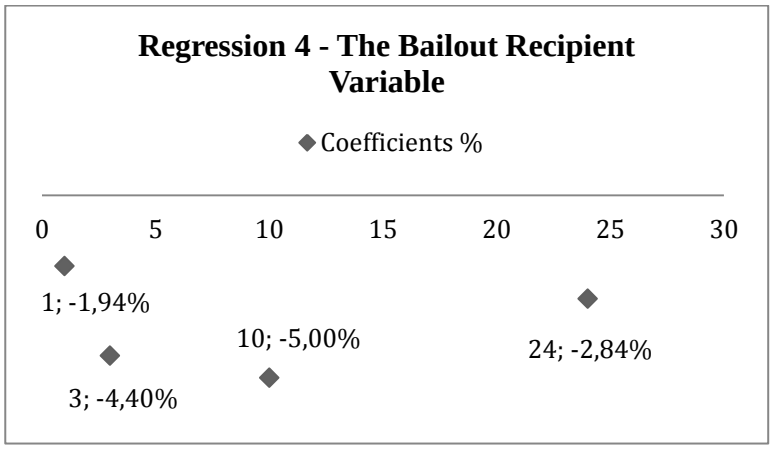


Figure H. The graph is based on Regression Table VII-VIII. It plots the coefficient in % for each of the four event windows. The windows are displayed on the x-axis :+/- 1 days = 1, +/- 3 days = 3, +/- 10 days = 10 and +/- 24 days = 24. The plotted values show how bailout recipients performed relative to non-recipients in terms of CARs expressed in %.

About the "Government Suppliers" in regression 4, we can see that they are significant during the +/- 24 and +/- 10 days event windows (at the 5% and 10% level, respectively). During the event window +/- 3 days the results are not significant (at the 10% level), and throughout the event window +/-1 days, the coefficient is significant (at the 10% level). Moving on, from Figure I we can see that the effect of being a government supplier is largest in the longest event window (+/- 24 days).

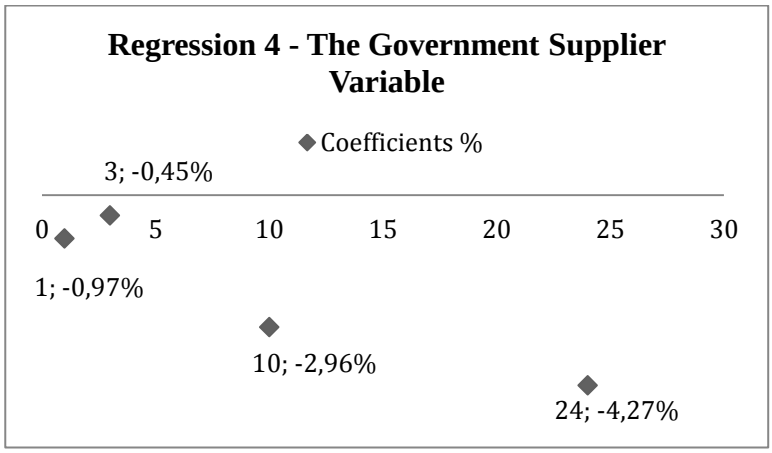


Figure I. The graph is based on Regression Table VII-VIII. It plots the coefficient in % for each of the four event windows. The windows are displayed on the x-axis :+/- 1 days = 1, +/- 3 days = 3, +/- 10 days = 10 and +/- 24 days = 24. The plotted values show how government suppliers performed relative to non-suppliers in terms of CARs expressed in %.

Finally, most attention should be paid to regression 3 and 4 as these include all control variables. As mentioned above, regression 4 differs from regression 3 because it also controls for sector specific fixed effects. Despite this control, the results are overall still significant for both dummy variables. Regarding regression 1 and 2, there is no clear difference when only the size variable is included. This, even though the high correlation between size and the dummy variables. Additionally, one can see that the government supplier variable has the largest effect during the longest event window (+/- 24 days) in all regressions. The bailout recipients generally show the largest reactions during the event windows +/- 3 and +/- 10 days.

5. Implications and Conclusions

This thesis investigates the implications of the U.S. debt crisis in the late summer of 2011, which eventually resulted in the historic downgrade of the U.S. government credit rating. The paper examines the development of MCARs of 19 different sectors listed on American stock exchanges. Moreover, the study is continued with analyses on firm level and specifically focuses on the reactions of government suppliers and government bailout recipients.

During the event, we can conclude that many industries perform negative MCARs that are both statistically and economically significant. Also, the closer the downgrading, the more industries perform negative and significant MCARs. This last fact can be interpreted as support for the impact of the sole credit rating downgrade. Moreover, some industries already display negative MCARs during the longer event windows, which implies a potential anticipation of the forthcoming downgrading. One can therefore conclude that the downgrading itself was powerful enough for industries to react significantly, despite signs of earlier anticipation of the event.

Concerning the government suppliers and bailout recipients, it is possible to identify a significant relationship between negative performance and these two firm classifications during the event. In other words, government suppliers and bailout recipients generally perform worse than firms with no supply or bailout relationship to the government. This conclusion also generally holds when controlling for stock and firm characteristics (such as past returns, volatility, size, market-to-book value, and leverage), as well as for industry fixed effects.

Regarding the fixed effect findings mentioned in the previous paragraph, one can conclude that the earlier described effects of government suppliers and bailout recipients are not attributable to specific sectors, but hold in general for all firms. However, due to data limitations discussed earlier in this paper, our data set of government suppliers and government bailout recipients is not extensive. With a complete dataset of government contractors and bailout recipients, one could redo the fixed effect analyses (regression 4) and perhaps find different results.

Furthermore, for industries performing negatively during the whole event window, but also seeming to have a negative pre-trend, one could argue that there could theoretically be some other explanation of the negative MCARs. However, since the absolute

majority of these industries drop during the shortest event windows and thus show a reaction to the downgrading, it is very probable that previous drops during the whole event window are attributable to the debt crisis. We therefore find it probable that industries with hypothetical pre-trends are not performing negatively because of some other event unrelated to the debt crisis or credit rate downgrading.

Our findings imply that the economic intuition behind lower future government spending, attributable to government saving cuts and lowered credit rating, seems to hold. Furthermore, the discoveries in this paper are also in line with previous literature on the topic. Earlier studies have concluded that sovereign credit rating downgrades result in significant negative market reactions. Our paper shares this conclusion.

Lastly, as sovereign credit crises in today's world economy no longer are referred to as completely unusual events, we believe that knowledge about firm characteristics determining performance during these crises is essential for investors. This paper has shed light on the topic in terms of government suppliers and bailout recipients.

6. Future Research

As this thesis verifies that government suppliers and government bailout recipients have a statistically significant relationship with negative performance in terms of CARs, compared to companies that do not have a supply or bailout relationship to the government, during a debt crisis, we believe that it would be of great interest to dig deeper into this topic.

The findings in this study, despite the limited data, provide incentives for future research and should motivate further and more detailed investigations. As our dataset of government suppliers and bailout recipients is small and limited, a first step could be to redo the study with more detailed and extensive records on government suppliers and bailout recipients. It would also be of interest to consider the effect of more factors than government suppliers and bailout recipients. Downgrades of other countries than USA could also be examined and studied in terms of government suppliers and bailout recipients to see if these findings are applicable internationally.

7. References

[1] Cantor, Richard Martin and Packer, Frank (October 1996). "Determinants and Impact of Sovereign Credit Ratings". Economic Policy Review, Vol. 2, No. 2, October 1996.

[2] Wakeman, L. M (1981). "The Real Function of Bond Rating Agencies." Chase Financial Quarterly: 18-26

[3] Weinstein, Mark (1977). "The Effect of a Rating Change Announcement on Bond Price." Journal of Financial Economics 5: 329-350.

[4] Pinches, E G and J C Singleton (1978). "The adjustment of stock prices to bond rating changes", Journal of Finance, vol 33, issue 1, pp 29–44.

[5] Cornell, B., W. Landsman and A. Shapiro (1989). "Cross-Sectional Regularities in the Response of Stock Prices to Bond Rating Changes." Journal of Accounting, Auditing, and Finance, 4: 460-479

[6] Griffin, P A and Sanvicente, A Z., (1982). "Common Stock Returns and Rating Changes: A Methodological Comparison", *Journal of Finance* 37, pp. 103-119

[7] Brooks, R., R. Faff, D. Hillier, and J. Hillier (2004). "The National Market Impact of Sovereign Rating Changes", Journal of Banking and Finance, Vol. 28, pp. 233-250.

[8] Pukthuanthong-Le, K., Elayan, F.A., & Rose, L.C. (2007). Equity and debt market responses to sovereign credit ratings announcement. *Global finance journal*, 18, 47-83.

[9] Holthausen, R. and R. Leftwich, (1986). "The effect of bond rating changes on common stock prices", Journal of Financial Economics 17, 57-89.

[10] Bissoondoyal-Bheenick, Emawtee and Brooks, Robert Darren (August 1, 2008). The Impact of Sovereign Ratings Changes: A Comparison of the Market Model, Quadratic Market Model and Downside Model. 21st Australasian Finance and Banking Conference 2008.

Electronic Resources

[11] CRSP, Center for Research in Security Prices. CRSP Security Files. Available online: https://wrds-web.wharton.upenn.edu/wrds//ds/crsp/navstksec_a.cfm?navGroupHeader=Annual%20Update&navGroup=Stock%20%2F%20Security%20Files (2013-05-11)

[12] CRSP, Center for Research in Security Prices. CRSP/Compustat Merged. Available online: https://wrds-web.wharton.upenn.edu/wrds//ds/crsp/navccm_a.cfm?navGroupHeader=Annual%20Update&navGroup=CRSP%2FCompustat%20Merged (2013-05-11)

[13] FPDS, Federal Procurement Data System. Top 100 Contractors Report. Available online: https://www.fpds.gov/fpdsng/index.php/reports (2013-05-11)

[14] ProPublica. Bailout Recipients. Available online: http://projects.propublica.org/bailout/list/simple (2013-05-11)

[15] Princeton University. Event Studies with Stata. Available online: http://dss.princeton.edu/online_help/analysis/eventstudy.html (2013-05-11)

8. Appendix

Quotation I. Standard and Poor's on the Downgrading
The quotation is taken from Standard and Poor's webpage.

"More broadly, the downgrade reflects our view that the effectiveness, stability, and predictability of American policymaking and political institutions have weakened at a time of ongoing fiscal and economic challenges to a degree more than we envisioned when we assigned a negative outlook to the rating on April 18, 2011. Since then, we have changed our view of the difficulties in bridging the gulf between the political parties over fiscal policy, which makes us pessimistic about the capacity of Congress and the Administration to be able to leverage their agreement this week into a broader fiscal consolidation plan that stabilizes the government's debt dynamics any time soon."

- Standard & Poor's on the downgrading

Table I. Sectors Classified by NAICS

The table shows the names of the 19 sectors investigated in our thesis, all classified according to the North American Industry Classification System. The number in the parenthesises after the sector names represents the two first digits in the NAICS codes.

1. Agriculture, Forestry, Fishing and Hunting (11)
2. Mining, Quarrying, and Oil and Gas Extraction (21)
3. Utilities (22)
4. Construction (23)
5. Manufacturing (31, 32, 33)
6. Wholesale Trade (42)
7. Retail Trade (44, 45)
8. Transportation and Warehousing (47, 48, 49)
9. Information (51)
10. Finance and Insurance (52)
11. Real Estate and Rental and Leasing (53)
12. Professional, Scientific, and Technical Services (54)
13. Management of Companies and Enterprises (55)
14. Administrative and Support and Waste Management and Remediation Services (56)
15. Educational Services (61)
16. Health Care and Social Assistance (62)
17. Arts, Entertainment, and Recreation (71)
18. Accommodation and Food Services (72)
19. Other Services (except Public Administration) (81)

Table II. Number of Firms by Sector

Number of firms: Total number of firms in each sector. **Number of Government Suppliers**: This column shows how the total number of government suppliers is distributed across sectors in absolute and relative terms. The source of the government suppliers is the list of the top 100 contractors to the federal government of the United States. Only 35/100 companies matched the dataset. **Number of Bailout Recipients**: This column shows how the total number of government bailout recipients is distributed across sectors in absolute and relative terms. Companies that were bailed out by USD 100 MLN or more have been taken into consideration. Only 59/116 companies matched our dataset. The firms are all classified as common stock and are traded on AMEX, NASDAQ or NYSE. The data is downloaded from CRSP, Federal Procurement Data Systems and ProPublica.

Sector	Number of Firms	Number of Government Suppliers	%	Number of Bailout Recipients	%
Agriculture, Forestry, Fishing and Hunting	10	-	-	-	-
Mining, Quarrying, and Oil and Gas Extraction	206	-	-	-	-
Utilities	97	-	-	-	-
Construction	38	1	3%	-	-
Manufacturing	1380	17	49%	1	2%
Wholesale Trade	71	1	3%	-	-
Retail Trade	171	1	3%	-	-
Transportation and Warehousing	103	2	6%	-	-
Information	271	1	3%	-	-
Finance and Insurance	589	2	6%	48	81%
Real Estate and Rental and Leasing	48	-	-	-	-
Professional, Scientific, and Technical Services	219	9	26%	-	-
Management of Companies and Enterprises	113	-	-	10	17%
Administrative and Support etc.	67	1	3%	-	-
Educational Services	19	-	-	-	-
Health Care and Social Assistance	58	-	-	-	-
Arts, Entertainment, and Recreation	32	-	-	-	-
Accommodation and Food Services	55	-	-	-	-
Other Services (except Public Administration)	15	-	-	-	-
Total	3562	35	100%	59	100%

Table III. Data Construction

The table shows how our control variables are calculated. The estimation window spans form December 1, 2010 to July 1, 2011. The stock specific data is collected from CRSP and the firm specific data is collected from CRSP/Compustat Merged. The list of contractors is downloaded from Federal Procurement Data Systems and the list of bailout recipients is downloaded from ProPublica.

Stock Characteristcs	
Market-to-Book	Fiscal closing share price divided by book value per share in December 2010
Past Returns	Mean holding period return during estimation window multiplied with 100
Volatility	The standard deviation of a firm's holding period return during estimation window

Firm Characteristics	
Bailout Dummy	Variable is given the value 1 if the firm has received bailout funds from the government (otherwise 0)
Contractor Dummy	Variable is given the value 1 if the firm acts a government supplier (otherwise 0)
Firm Size	The natural logarithm of a firm's total assets (BV) in December 2010
Leverage	Total long-term debt divided by total assets (BV) in December 2010

Table IV. Mean Cumulative Abnormal Returns by Sector during Event Windows

This table reports mean cumulative abnormal returns (MCARs) for each sector during all event windows (We calculate cumulative abnormal returns for all firms in each sector, and then collapse the results to get the daily MCAR for each industry during the event windows). Significance tests of MCARs are conducted for each sector and event window. (The data is downloaded from CRSP and the sectors are classified according to NAICS. The sectors consist of common stocks traded on AMEX, NYSE or NASDAQ.) Cumulative Abnormal Returns (CARs) are calculated using the market model and * indicates significance at the 1% (***), 5% (**) and 10% (*) level. (The average CAR (standard deviation of CAR) is -3.51% (5.64%) for event window +/- 24 days, -2.94% (3.82%) for event window +/- 10 days, -2.25% (1.95%) for event window +/- 3 days and -1.09% (0.78%) for event window +/- 1 days. This information is based on table V. The minimum number of firms in one sector is 10, and the maximum number is 1480. This information is based on table II). Please see table II and V for more careful information about the number of firms in each industry, as well as for descriptive statistics of the MCARs, respectively.

Sector	Event Window	MCAR (day 24)	Event Window	MCAR (day 10)	Event Window	MCAR (day 3)	Event Window	MCAR (day 1)
Agriculture, Forestry, Fishing and Hunting	+/- 24 days	3.27%	+/- 10 days	-2.29%	+/- 3 days	0.57%	+/- 1 days	-1.04%
Mining, Quarrying, and Oil and Gas Extraction	+/- 24 days	8.08%***	+/- 10 days	1.53%	+/- 3 days	-0.44%***	+/- 1 days	-0.42%**
Utilities	+/- 24 days	4.98%	+/- 10 days	3.79%	+/- 3 days	1.88%**	+/- 1 days	0.41%***
Construction	+/- 24 days	-5.95%	+/- 10 days	-5.36%	+/- 3 days	-6.04%	+/- 1 days	-2.41%
Manufacturing	+/- 24 days	-3.24%***	+/- 10 days	-2.84%***	+/- 3 days	-2.24%***	+/- 1 days	-0.84%
Wholesale Trade	+/- 24 days	-1.71%	+/- 10 days	-0.82%	+/- 3 days	-1.45%	+/- 1 days	-0.5%***
Retail Trade	+/- 24 days	-0.59%	+/- 10 days	-2.7%	+/- 3 days	-2.24%**	+/- 1 days	-0.78%***
Transportation and Warehousing	+/- 24 days	-5.55%*	+/- 10 days	-2.41%*	+/- 3 days	-1.58%**	+/- 1 days	-0.82%***
Information	+/- 24 days	-6.84%***	+/- 10 days	-2.79%	+/- 3 days	-2.61%***	+/- 1 days	-1.01%
Finance and Insurance	+/- 24 days	-1.82%	+/- 10 days	-0.089249%	+/- 3 days	-1.72%***	+/- 1 days	-0.28%***
Real Estate and Rental and Leasing	+/- 24 days	-7.01%	+/- 10 days	-4.26%	+/- 3 days	-1.89%	+/- 1 days	-1.55%**
Professional, Scientific, and Technical Services	+/- 24 days	-4.5%	+/- 10 days	-2.9%	+/- 3 days	-4.27%***	+/- 1 days	-1.49%***
Management of Companies and Enterprises	+/- 24 days	-2.73%	+/- 10 days	-0.59%*	+/- 3 days	-2.43%**	+/- 1 days	-1.16%***
Administrative and Support etc.	+/- 24 days	0.28%	+/- 10 days	-1.22%	+/- 3 days	-3.72%	+/- 1 days	-2.74%**
Educational Services	+/- 24 days	-8.11%	+/- 10 days	-12.21%	+/- 3 days	-2.9%	+/- 1 days	-0.64%
Health Care and Social Assistance	+/- 24 days	-18.19%***	+/- 10 days	-11.87%***	+/- 3 days	-5.53%***	+/- 1 days	-2.11%***
Arts, Entertainment, and Recreation	+/- 24 days	-3.75%	+/- 10 days	-3.65%*	+/- 3 days	-4.02%***	+/- 1 days	-1.79%
Accommodation and Food Services	+/- 24 days	-6.66%***	+/- 10 days	-3.21%*	+/- 3 days	-1.62%**	+/- 1 days	-1.18%***
Other Services (except Public Administration)	+/- 24 days	-6.66%	+/- 10 days	-1.9%	+/- 3 days	-0.55%	+/- 1 days	-0.35%

Table V. Descriptive Statistics of Mean Cumulative Abnormal Returns by Event Window
This table presents descriptive statistics of mean cumulative abnormal returns (all sectors) by event window. The mean cumulative abnormal returns are displayed in table IV.

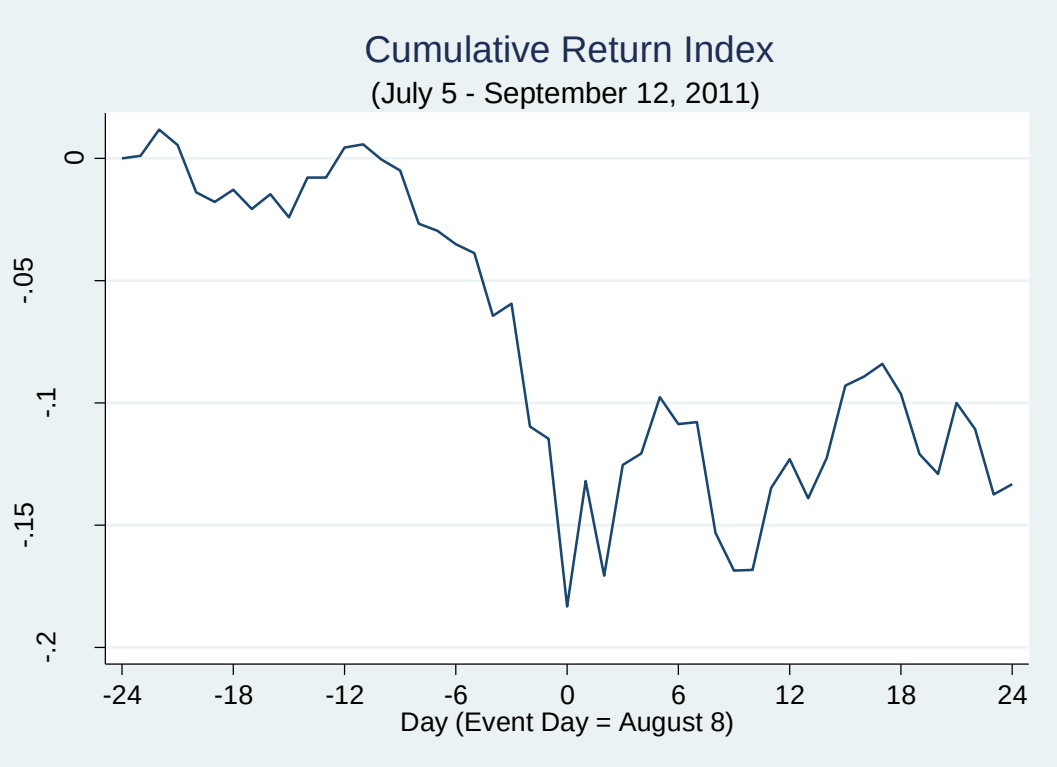
Event Window	+/- 24 Days	+/- 10 Days	+/- 3 Days	+/- 1 Days
Max MCAR	0.08%	3.79%	1.88%	0.41%
Average MCAR	-3.51%	-2.94%	-2.25%	-1.09%
Min MCAR	-18.19%	-12.21%	-6.04%	-2.74%
Standard Deviation MCAR	5.64%	3.82%	1.95%	0.78%

Table VI. Correlation Matrix

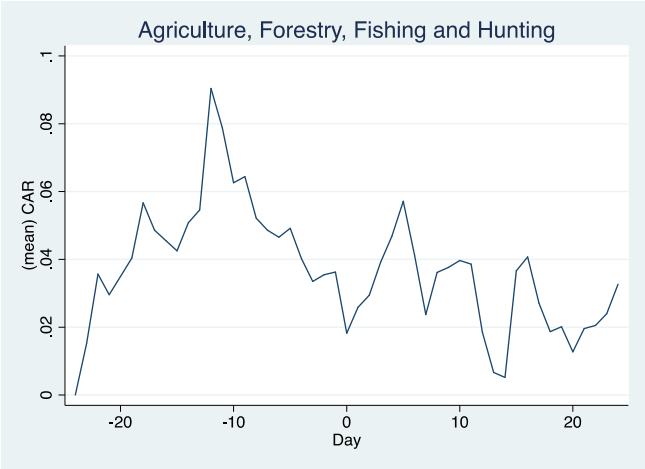
The table displays the correlation between the independent variables.

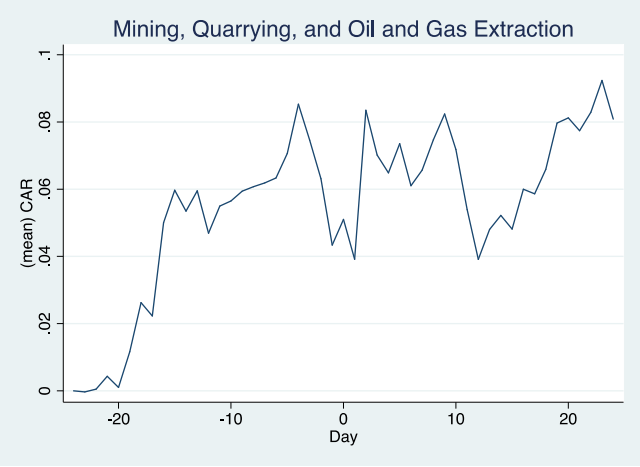
	Contractor Dummy	Bailout Dummy	Market-to-Book	Past Returns	Volatility	Firm Size	Leverage
Contractor Dummy							
Bailout Dummy	-0.0124						
Market-to-Book	0.0018	-0.0006					
Past Returns	0.0046	-0.0051	0.001				
Volatility	-0.0762	-0.0635	-0.0021	0.0935			
Firm Size	0.1496	0.2255	-0.0049	-0.0032	-0.5237		
Leverage	-0.0022	-0.0373	-0.0325	0.0518	-0.0819	0.2656	

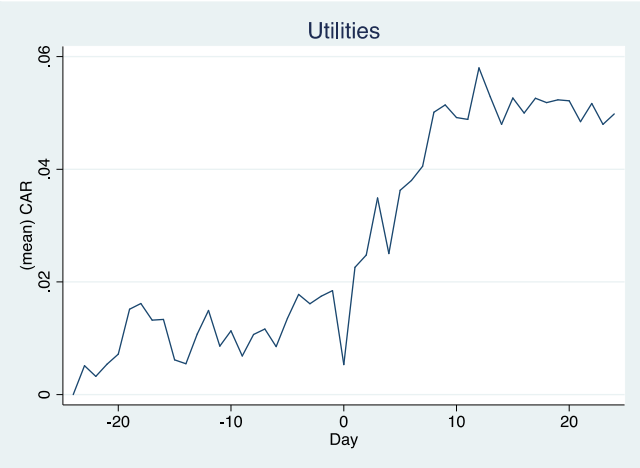
Figure A. Cumulative Return on Value-Weighted Index (Event Window +/- 24 Days)
The graph shows cumulative returns for a value-weighted index consisting of AMEX, NASDAQ, NYSE and ARCA. It is the same index used as benchmark when calculating the cumulative abnormal returns. The graph displays the development during the longest event window reaching from July 5, 2011 to September 12, 2011 (+/-24 days). The downgrade was announced on the late evening of Friday August 5, which results in an event day of Monday August 8. The data is downloaded from CRSP.



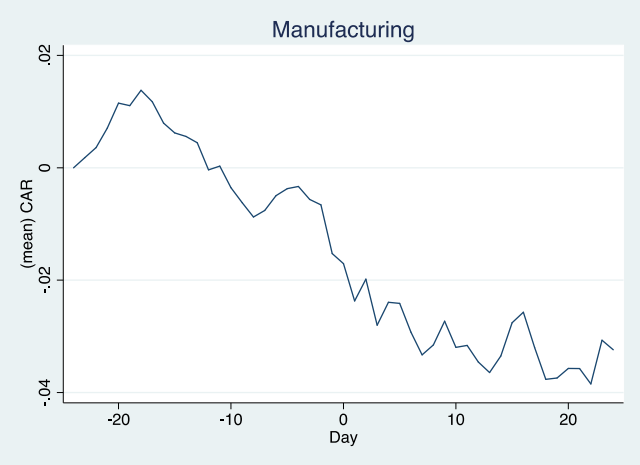
Figures. Mean Cumulative Abnormal Returns by Sector (Event Window +/- 24 Days)
The 19 following figures show the development of mean cumulative abnormal returns by sector. The event window reaches from July 5, 2011 to September 12, 2011 (+/-24 days). The sectors are classified according to North American Industry Classification System and CARs are calculated using the market model. Day zero is the event day (August 8, 2011). The stock and benchmark index data is downloaded from CRSP. Please see table II for the number of firms in each sector.





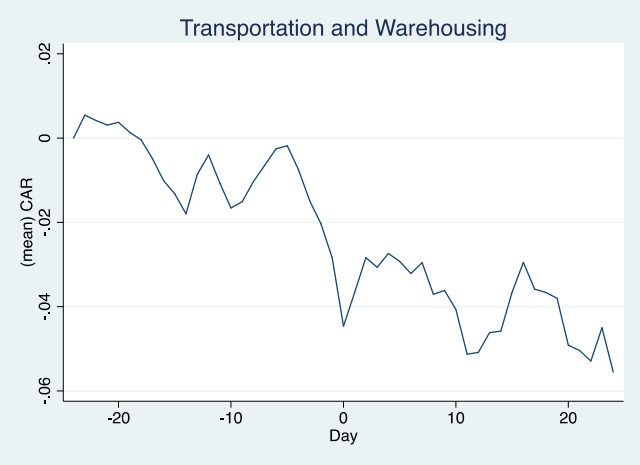

Utilities
(mean) CAR
0
.02
.04
.06
-20
-10
0
10
20
Day

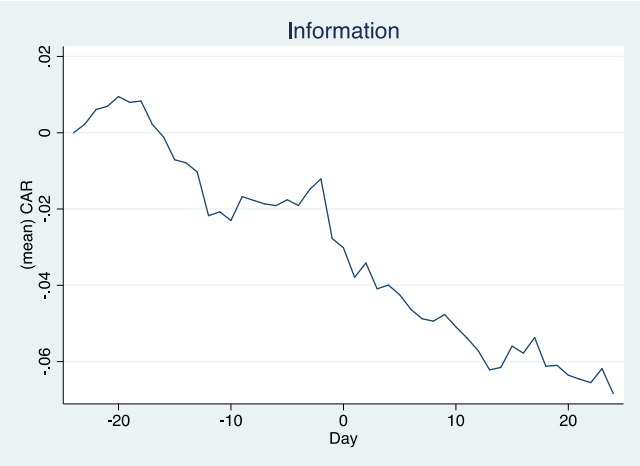

Construction
(mean) CAR
-.08
-.06
-.04
-.02
0
.02
-20
-10
0
10
20
Day

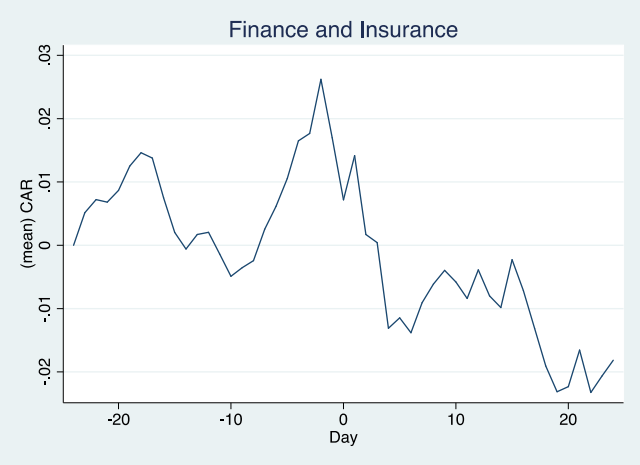

Manufacturing
(mean) CAR
-.04
-.02
0
.02
-20
-10
0
10
20
Day


Wholesale Trade
(mean) CAR
.02
.01
0
-.01
-.02
-20
-10
0
10
20
Day

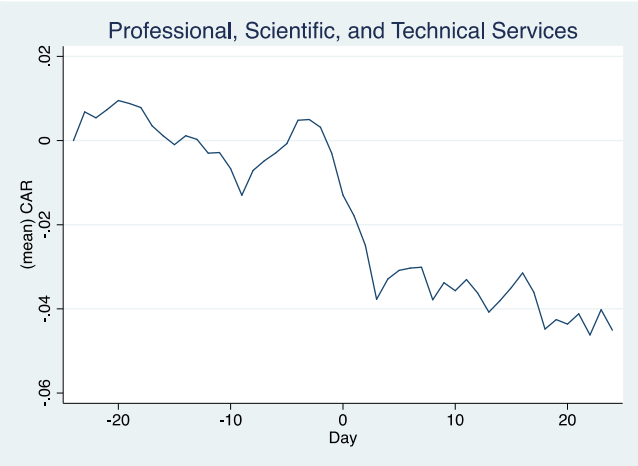

Retail Trade
(mean) CAR
.02
0
-.02
-.04
-20
-10
0
10
20
Day

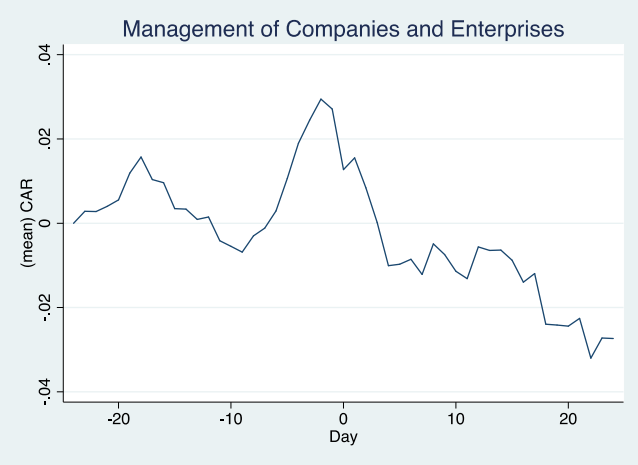

Transportation and Warehousing
(mean) CAR
.02
0
-.02
-.04
-.06
-20
-10
0
10
20
Day

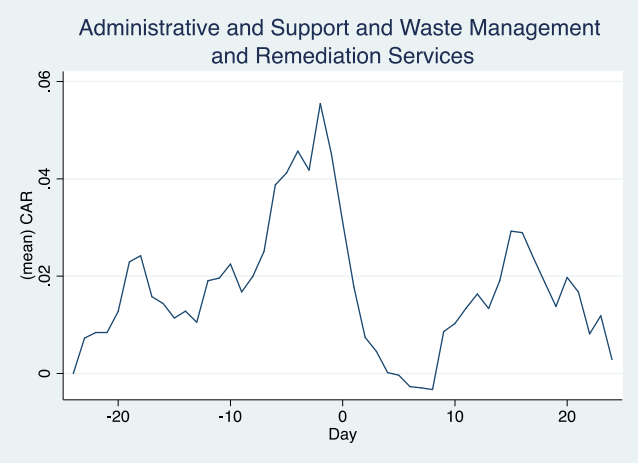

Information
(mean) CAR
.02
0
-.02
-.04
-.06
-20
-10
0
10
20
Day

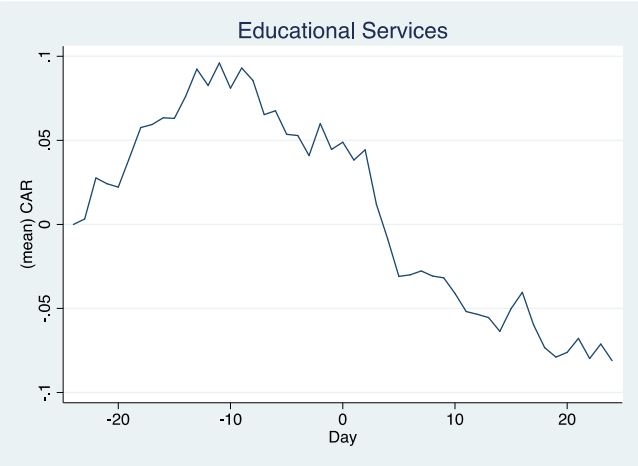

Finance and Insurance
(mean) CAR
.03
.02
.01
0
-.01
-.02
-20
-10
0
10
20
Day

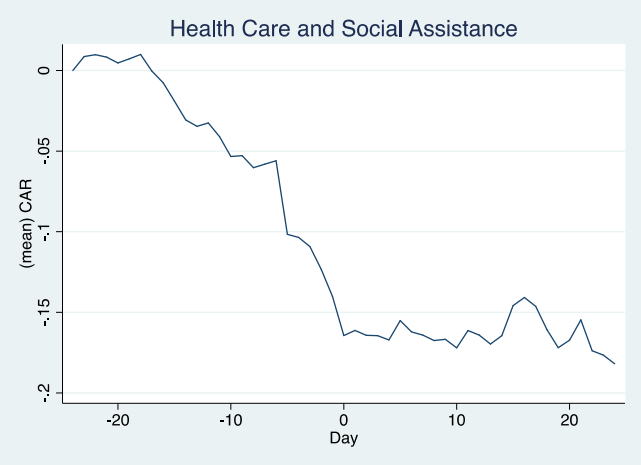

Real Estate and Rental and Leasing
(mean) CAR
.02
0
-.02
-.04
-.06
-.08
-20
-10
0
10
20
Day

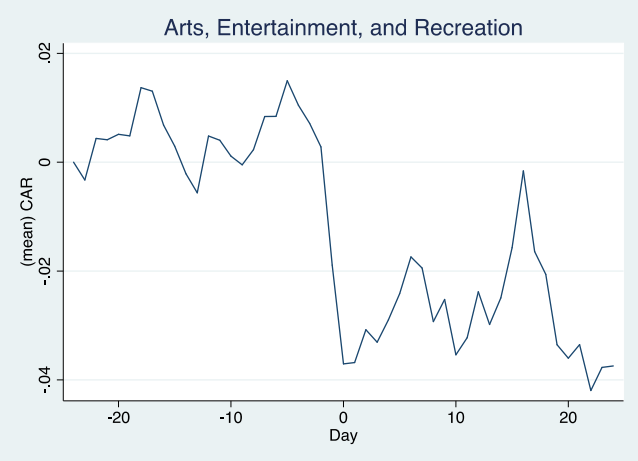

Professional, Scientific, and Technical Services
(mean) CAR
.02
0
-.02
-.04
-.06
-20
-10
0
10
20
Day


Management of Companies and Enterprises
(mean) CAR
.04
.02
0
-.02
-.04
-20
-10
0
10
20
Day


Administrative and Support and Waste Management
and Remediation Services
(mean) CAR
.06
.04
.02
0
-20
-10
0
10
20
Day


Educational Services
(mean) CAR
.1
.05
0
-.05
-.1
-20
-10
0
10
20
Day


Health Care and Social Assistance
(mean) CAR
0
-.05
-.1
-.15
-.2
-20
-10
0
10
20
Day


Arts, Entertainment, and Recreation
(mean) CAR
.02
0
-.02
-.04
-20
-10
0
10
20
Day


Accommodation and Food Services
(mean) CAR
.02
0
-.02
-.04
-.06
-20
-10
0
10
20
Day

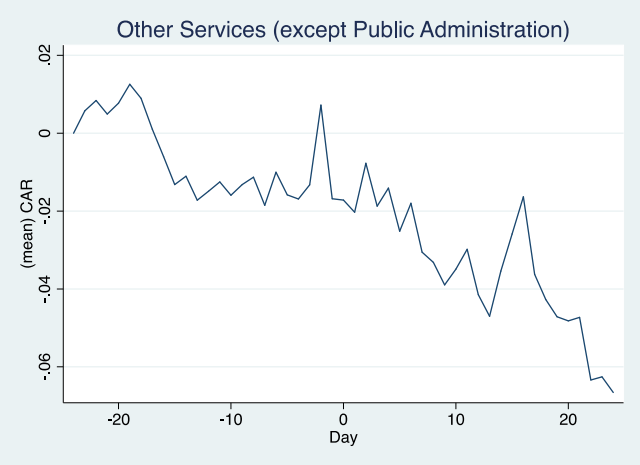

Other Services (except Public Administration)
(mean) CAR
.02
0
-.02
-.04
-.06
-20
-10
0
10
20
Day

Table VII - VIII. Multivariate Regression Analysis

The two tables report the result of OLS cross-sectional regressions. The dependent variable is Cumulative Abnormal Returns (CARs) during four event windows. The first table presents the two long-term event windows (+/- 24 days and +/- 10 days), and the second table presents the two short-term event windows (+/- 3 days and +/- 1 days). The CARs are calculated using the market model. Column "1" only shows the results from the regression with our two dummy variables (Bailout Dummy = 1 if a company has received bailout funds more than $100MLN from the government, and Contractor Dummy = 1 if a company is on the list of the top 100 contractors to the federal government of the United States). Column "2" shows the regression of CARs on dummies while controlling for firm size. Column "3" shows the regression when we use all of our chosen control variables (both firm and stock characteristics), and column "4" shows the same as column "3", but we also control for industry fixed effects. Robust standard errors are used in the regressions and the construction of our control variables can be found in table III. The robust standard errors are presented in parenthesis and coefficients are written above. * indicates significance at 1% (***), 5% (**) and 10% (*). The regressions also include the number of companies (N).

	Index (All Sectors) (AMEX, NASDAQ & NYSE) - Long-Term Event Windows							
	1	2	3	4	1	2	3	4
	CAR Day 24	CAR Day 24	CAR Day 24	CAR Day 24	CAR Day 10	CAR Day 10	CAR Day 10	CAR Day 10
Bailout Dummy	-0.0205	-0.0199	-0.0357*	-0.0284	-0.0274**	-0.0385***	-0.0403***	-0.0500***
	(0.0169)	(0.0179)	(0.0187)	(0.0191)	(0.0132)	(0.0140)	(0.0144)	(0.0148)
Contractor Dummy	-0.0547***	-0.0541***	-0.0558***	-0.0427**	-0.0301*	-0.0400**	-0.0409**	-0.0296*
	(0.0188)	(0.0195)	(0.0189)	(0.0199)	(0.0162)	(0.0165)	(0.0165)	(0.0173)
Stock Characteristics								
Market-to-Book	-	-	8.46e-05***	8.88e-05***	-	-	7.50e-05***	7.63e-05***
	-	-	(1.41e-05)	(1.57e-05)	-	-	(6.86e-06)	(6.93e-06)
Past Returns	-	-	-0.465***	-0.465***	-	-	-0.192***	-0.190***
	-	-	(0.0238)	(0.0237)	-	-	(0.0193)	(0.0194)
Volatility	-	-	0.238	0.132	-	-	-0.814**	-0.870***
	-	-	(0.413)	(0.418)	-	-	(0.316)	(0.323)
Firm Characteristics								
Firm Size	-	-0.000178	0.00242	0.000188	-	0.00294**	0.000821	-0.00144
	-	(0.00189)	(0.00203)	(0.00208)	-	(0.00131)	(0.00153)	(0.00155)
Leverage	-	-	-0.0663***	-0.0565***	-	-	-0.0367**	-0.0257*
	-	-	(0.0195)	(0.0195)	-	-	(0.0144)	(0.0148)
Constant	-0.0282***	-0.0271*	0.00609	0.00823	-0.0216***	-0.0407***	0.0191	0.0400**
	(0.00369)	(0.0142)	(0.0202)	(0.0240)	(0.00268)	(0.00981)	(0.0156)	(0.0192)
N	3,562	3,562	3,562	3,562	3,563	3,563	3,563	3,563
Adjusted R-squared	0.001	0.001	0.216	0.240	0.001	0.002	0.083	0.099

	Index (All Sectors) (AMEX, NASDAQ & NYSE) - Short-Term Event Windows							
	1	2	3	4	1	2	3	4
	CAR Day 3	CAR Day 3	CAR Day 3	CAR Day 3	CAR Day 1	CAR Day 1	CAR Day 1	MCAR Day 1
Bailout Dummy	-0.0279***	-0.0458***	-0.0468***	-0.0440***	-0.00942*	-0.0194***	-0.0187***	-0.0194***
	(0.00915)	(0.00954)	(0.00955)	(0.00986)	(0.00556)	(0.00586)	(0.00585)	(0.00612)
Contractor Dummy	0.00737	-0.00841	-0.00995	-0.00453	-0.00227	-0.0111**	-0.0120***	-0.00970*
	(0.00870)	(0.00888)	(0.00887)	(0.00966)	(0.00462)	(0.00468)	(0.00462)	(0.00507)
Stock Characteristics								
Market-to-Book	-	-	3.59e-05**	3.63e-05**	-	-	3.78e-05***	3.85e-05***
	-	-	(1.57e-05)	(1.60e-05)	-	-	(9.14e-06)	(9.24e-06)
Past Returns	-	-	-0.0294***	-0.0275***	-	-	-0.00499	-0.00463
	-	-	(0.00958)	(0.00964)	-	-	(0.00674)	(0.00674)
Volatility	-	-	-0.393**	-0.389**	-	-	-0.395***	-0.419***
	-	-	(0.176)	(0.181)	-	-	(0.111)	(0.113)
Firm Characteristics								
Firm Size	-	0.00472***	0.00382***	0.00335***	-	0.00265***	0.00149**	0.00106*
	-	(0.000710)	(0.000934)	(0.000957)	-	(0.000511)	(0.000608)	(0.000620)
Leverage	-	-	-0.0214***	-0.0255***	-	-	-0.0119**	-0.00953
	-	-	(0.00791)	(0.00809)	-	-	(0.00598)	(0.00633)
Constant	-0.0209***	-0.0514***	-0.0291***	-0.00642	-0.00800***	-0.0251***	-0.00497	-0.00356
	(0.00158)	(0.00533)	(0.00942)	(0.0126)	(0.00106)	(0.00388)	(0.00585)	(0.00762)
N	3,563	3,563	3,563	3,563	3,563	3,563	3,563	3,563
Adjusted R-squared	0.002	0.012	0.024	0.036	0.000	0.008	0.019	0.024