

**THE MARKET'S RESPONSE TO CONTRACT
AWARD ANNOUNCEMENTS: GOVERNMENT VERSUS
CORPORATE CONTRACTS**

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ABSTRACT. This paper examines the effects of contract award announcements on the stock returns of successful grantees. Contract awards are identified using Lexis/Nexis and classified according to whether the grantor is another corporation or government body. The government grantors are further classified according to the type of government entity granting the contract. Four sub-samples emerge: federal (non-military), military, municipal, and foreign. The results suggest that contract awards granted by foreign governments are more lucrative than contract awards granted by corporations or American governmental bodies. This finding endures even after controlling for potentially confounding factors.

INTRODUCTION

The release of new information pursuant to a firm's prospects can result in a positive, negative, or immaterial reaction from the market. This study examines abnormal returns surrounding contract award announcements for successful grantees. Specifically, the reaction of stock prices in response to the announcement of contract awards is examined to determine if contract awards meet the criteria of the positive net present value hypothesis or the fair contract hypothesis. Herein, the

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term “grantor” refers to a corporation or government body that grants a contract, and “grantee” refers to publicly traded corporations winning a contract.

Diltz (1990) studied the effect of government contract awards on the stock returns of successful grantees. He found some evidence that these contract awards were associated with positive abnormal returns. However, Diltz did not include contracts awarded by corporations in his sample. Therefore, he was unable to compare government contract awards to contracts awarded by corporations. The first contribution of this study is to make this comparison.

The second contribution of this study is the examination of government grantor subgroups. In a step beyond Diltz (1990), the sample of government contract awards is partitioned into four sub-samples: Federal government (non-military), military, municipal, and foreign.

While never before studied, some anecdotal claims even suggest contracts granted by foreign governments are more lucrative than contracts granted by other types of government or corporations. This is due in part to the complexity of cross-border contracts implying increased uncertainty and the assumed expediency of management’s overpricing to cover the increased risks. For some discussion of perceptions of greater risk and management effort aversion, see Chaney (1989) and Woods and Randall (1989).

RESEARCH HYPOTHESES

Contract awards can be considered projects deemed acceptable by management. The firm has agreed to perform actions in the future in exchange for a specified amount of revenue. Firms can obtain the required investment funds to fulfill contractual obligations by generating cash flow internally, by issuing debt, or by issuing new stock. The weighted average cost of these sources of capital is adjusted to reflect the specific risk characteristics of the contract. The result is the appropriate hurdle rate for the contract. For recent discussions of corporate cost of capital, see Fama and French (1999).

In this study, the objectives are to measure the market's response to contract award announcements, and to determine if government contract awards are perceived to be more lucrative than contract awards granted by corporations. The following equation is used to calculate the net present value (NPV) of a project:

$$NPV = \sum_{t=1}^N \frac{NCF_t}{(1 + hr)^t} - I_o \quad (1)$$

where:

NCF= the net cash flow in time period t,

N= the number of years of the contract's life,

hr = the hurdle rate, which depends on the firm's weighted average cost of capital and the contract's specific risk characteristics, and

I_o = the initial outlay of funds associated with performing the contract.

A contract award will be associated with a positive net present value if the present value of its expected net cash inflows exceeds the initial outlay of funds. In this case, the contract's revenue exceeds the amount required to pay all expected expenses, including financing costs. The extra remuneration accrues to the firm's stockholders so the announcement of such a contract should be associated with an increase in stock price. The positive NPV hypothesis is stated formally below:

Positive NPV Hypothesis: Contract award announcements will be followed by substantial increases in stock prices.

A fair contract is one where the revenue from the contract sufficiently covers all expected expenses, including the cost of financing. Such contracts generate just enough cash flow to cover all operating costs, and appropriately compensate security holders for the use of their funds. The announcement of these contracts should not be associated with increases in stock prices. The fair contract hypothesis, which is stated formally below, cannot be rejected if the positive NPV hypothesis is rejected.

Fair Contract Hypothesis: Contract award announcements will not be followed by substantial increases in stock prices.

A positive net present value contract indicates the grantor has agreed to pay more for the work performed than necessary in order to compensate the grantee for its costs, including paying a fair return to its

security holders. It suggests the grantor possesses an agency problem as the agents agree to pay more than a fair price for products or services. If the grantor is another corporation, the agency problem exists between its management and its stockholders where the managers are the agents. If the grantor is a government body, the agency problem exists between public officials and constituents where the public officials are the agents.

It seems reasonable to assume that corporations are subject to more financial scrutiny than governments. Therefore, contracts granted by government bodies may be more lucrative than contracts granted by other corporations. Corporations must report financial dealings to stockholders who scrutinize the data. Moreover, many shares are typically owned by financial institutions, which are managed by professionals who closely monitor management decisions. In contrast, government bodies are not typically subject to this same level of financial scrutiny. In light of this argument, it is expected that contracts granted by governments will be more lucrative. The government contract hypothesis is stated formally below:

Government Contract Hypothesis: Contract award announcements will be associated with significantly higher increases in stock prices when the grantor is a government body.

Cross-Sectional Analysis

A cross-sectional analysis is conducted to test the government contract hypothesis while controlling for potentially confounding factors. The factors that could affect the market's response at the time the contract awards are announced are identified in Table 1 along with the hypothesized effect on the abnormal returns.

Contract award announcements include the revenue paid by the grantor, and the number of years over which the revenue will be paid out. A relatively large contract should produce more cash flow for stockholders so larger contracts should be associated with larger abnormal returns. Contracts that pay revenue over longer periods of time should be less lucrative due to the time value of money. Total

TABLE 1
Factors Affecting the Market's Response

Factor	Description	Hypothesized Effect on the Abnormal Returns
Contract Size	Revenue specified in the contract.	Positive
Years	Number of years over which the revenue is paid.	Negative
Total Assets	Grantee's total assets prior to contract award.	Negative

assets pertain to the grantee. A certain contract award should have less impact on the stock price of a relatively large firm.

RESEARCH DESIGN

Contract award announcements are identified using Lexis/Nexis. The grantees trade on the New York Stock Exchange, the American Stock Exchange, or the NASDAQ. Three-hundred-twenty-nine contract awards meet these requirements. Historical returns data is obtained from Dial Data's Historical Stock Prices and The Wall Street Journal.

Following Mikkelson and Parch (1988 and errata), an event study method is used to measure the market's response to the contract award announcements. For each contract award, stock returns are calculated for the pre-event estimation period (day -240 to day -41), the examination period (day -3 to day +5), and the post-event estimation period (day +41 to day +240). Abnormal returns during the examination period are estimated using the following model:

$$AR_{it} = R_{it} - (\alpha_i + \beta_i * R_{mt}) \quad (2)$$

where

R_{it} = the return of stock i on day t ,

R_{mt} = the return of the market on day t , and

α_i and β_i = the regression intercept and slope (beta) coefficient estimates.

The significance of the abnormal returns are determined by the following Z-statistic:

$$Z = \frac{1}{\sqrt{N}} \sum_{i=1}^N \left[\sum_{t=t_1}^{t_2} AR_{it} / \sqrt{\text{Var} \sum_{t=t_1}^{t_2} AR_{it}} \right] \quad (3)$$

where

t_1 = the first day of the examination period window,

t_2 = the last day of the examination period window,

N = the number of observations, and

Denominator = the square root of the variance of the cumulated prediction error of firm i .

This variance is defined to be:

$$\text{VAR} \left(\sum_{t=t_1}^{t_2} AR_{it} \right) = V_i^2 \left[T + \frac{T^2}{ED} + \frac{\left(\sum_{t=t_1}^{t_2} R_{mt} - T\bar{R}_m \right)^2}{\sum_{t=1}^{ED} (R_{mt} - \bar{R}_m)^2} \right] \quad (4)$$

where

V_i^2 = the residual variance of stock i 's market model regression,

T = the number of days in the examination period, ED is the number of days in the estimation period,

R_{mt} = the market return on day t , and

\bar{R}_m = the mean market return during the estimation period.

Various event windows (day 0, days 0,1, and days 2-5) are used with the objective of analyzing the timing of any abnormal returns. If the abnormal returns in the event window are positive and statistically significant, the fair contract hypothesis will be rejected in favor of the positive NPV hypothesis.

Cross-Sectional Analysis

The following cross-sectional equation is employed to test for differences in abnormal returns across the contract types while controlling for potentially confounding factors. The potentially confounding factors are the size (revenue) of the contract, the number of years over which the revenue is paid, the grantee's size (total assets) (See Eurrenza & Senbet 1984), the day of the week (Monday or Friday), and the change in the year (December and January). The dummy variables for day of the week and the change in the year represent recognized anomalies (See French 1980, Miller 1988, and Whyte & Picou 1993).

$$\begin{aligned} \text{CAR}_i(j,j+k) = & \alpha + \beta_1 \text{KSZ}_i + \beta_2 \text{YRS}_i + \beta_3 \text{TASST}_i + \beta_4 \text{FED}_i + \\ & \beta_5 \text{FORG}_i + \beta_6 \text{MIL}_i + \beta_7 \text{MUNI}_i + \beta_8 \text{MON}_i + \\ & \beta_9 \text{FRI}_i + \beta_{10} \text{DEC}_i + \beta_{11} \text{JAN}_{ii} + \varepsilon_i \end{aligned} \quad (5)$$

where:

$\text{CAR}_i(j,j+k)$ = the K-day cumulative abnormal return for security i commencing on day j ,

KSZ = the size (revenue) of the contract,

YRS = the number of years of the contract's life,

TASST = the total assets of the grantee for the previous fiscal year,

FED = a dummy variable equal to 1 if the grantor is the U.S. Federal Government (non-military),

FORG = a dummy variable equal to 1 if the grantor is a foreign government,

MIL = a dummy variable equal to 1 if the grantor is the U.S. Military,

MUNI = a dummy variable equal to 1 if the grantor is a municipal government,

MON = a dummy variable equal to 1 if the contract announcement were on a Monday,

FRI = a dummy variable equal to 1 if the contract announcement were on a Friday,

DEC = a dummy variable equal to 1 if the contract announcement occurred in December,

JAN = a dummy variable equal to 1 if the contract announcement occurred in January.

The government contract hypothesis is not rejected if any of the following coefficients are positive and significant: FED, FORG, MIL, MUNI. Four dummy variables representing the type of government are used in order to pinpoint which type of government, if any, grants contracts that are perceived to be more lucrative by the market.

RESEARCH RESULTS

Descriptive statistics for the 329 contract awards are disclosed in Table 2; there are seven samples. The full sample is broken down into two main sub-samples according to whether the grantor is a corporation or government. The government sample is then broken down according to the particular type of government awarding the contract: federal (non-military), military, municipal, and foreign. The first two rows inside the table disclose the number of contract awards and percentage of total contract awards for each sample. Rows three through five disclose the number of contract awards for each particular stock market, and the last

TABLE 2
Descriptive Statistics for 329 Contract Award Announcements
During the Period 1/1990 Through 7/1998

	All	Corporate	Govt.	Type of Government			
				Fed	Military	Muni.	Foreign
Sample size	329	99	230	42	102	48	38
% of total100	30	70	13	31	15	11	
No. NYSE	91	25	66	17	30	7	12
No. AMEX	37	18	19	3	13	1	2
No. NASDAQ	201	56	145	22	59	40	24
Avg. Contract Size ⁽¹⁾	\$39.05	\$17.41	\$48.36	\$37.77	\$68.99	\$36.29	\$19.95
Avg. Contract Life (In Days)	2.17	1.87	2.29	2.61	2.79	1.79	1.27
Avg. Total Assets ⁽²⁾	\$1,930.3	\$1,122.5	\$2,278.1	\$2,499.2	\$2,354.9	\$1,221.0	\$3,162.6

Notes: ⁽¹⁾ In millions.

⁽²⁾ grantee and in thousands.

three rows disclose the average size average life of the contracts, and the average grantee size measured by total assets.

Abnormal Returns Surrounding the Contract Award Announcements

Table 3 presents the results from measuring the abnormal returns surrounding the contract award announcements. Panel 1 of the table discloses the results for the full sample of contract awards. The mean abnormal returns associated with the 329 contract awards are presented in the first row inside the table; each column pertains to a different event window. The mean abnormal returns over days -3, -2, and -1 are shown to determine whether there was any leakage of information prior to the contract award announcements. The hypotheses for the market's response to the contract awards are tested by assessing the mean abnormal returns for day 0, day 1, days 0,1, and days 2-5. These event windows are used to measure the timing of the market's response and to account for stock price drift and overreaction. The statistical significance of the mean abnormal return per event window is designated in the second and third rows.

Table 3 (Panel 1) pertains to all contract awards and shows there is a significant positive abnormal return on day 0 and day 1. The mean abnormal returns are positive and statistically significant on day 0, day 1, and days 0,1. The mean abnormal return for this two-day period is 2.33%, which is statistically significant. Thus, the fair contract hypothesis is rejected in favor of the positive net present value hypothesis for the full sample of contract awards. The cumulative abnormal return for days 2-5 is not statistically significant. This suggests the market fully assessed the contract award announcements on day 0 and day 1. Table 3 (Panel 2) pertains to contracts granted by other corporations. The mean abnormal returns for day 0, day 1, days 0,1, and days 2-5 are positive. For day 0 and days 0,1 these mean abnormal returns are statistically significant. The cumulative mean abnormal return for day 0 and day 1 is 1.88%. The results suggest the market fully assessed these contract awards on day 0 and day 1 as the mean abnormal return for days 2-5 is not statistically significant. The fair contract hypothesis is rejected in favor of the positive net present value

TABLE 3
Abnormal Returns (Grantee) Pursuant to 329 Contract Awards
During the Period 1/1990 through 7/1998

	Day -3	Day -2	Day -1	Day 0	Day 1	Days 0,1	Day 2-5
Panel 1: All Contracts (n=329)							
Mean Abnormal							
Return	-0.19%	0.11%	-0.29%	1.38%	0.95%	2.33%	-0.02%
Z statistic	-0.67	0.82	-1.70	5.95	1.89	5.53	-0.37
Significance			*	***	*	***	
Panel 2: Corporate (n=99)							
Mean Abnormal							
Return	-0.15%	0.21%	-0.55%	1.00%	0.88%	1.88%	0.19%
Z statistic	-0.52	0.85	-1.75	2.64	1.03	2.59	1.14
Significance			*	***		***	
Panel 3: All Government (n=230)							
Mean Abnormal							
Return	-0.21%	0.07%	-0.17%	1.55%	0.98%	2.52%	0.19%
Z statistic	-0.46	0.42	-0.89	5.39	1.59	4.91	0.30
Significance				***		***	
3a. Federal Government --Non-Military (n=42)							
Mean Abnormal							
Return	-0.31%	-0.94%	0.24%	1.56%	-0.97%	0.59%	-1.46%
Z statistic	-0.12	-1.26	0.46	2.75	-1.05	1.19	-1.26
Significance				***			
3b. Federal Government--Military (n=102)							
Mean Abnormal							
Return	-0.01%	0.33%	0.30%	1.57%	2.10%	3.67%	-0.21%
Z statistic	-0.08	1.42	0.46	3.67	1.80	3.86	-0.56
Significance				***	*	***	
3c. Municipal Government (n=48)							
Mean Abnormal							
Return	-0.44%	1.02%	-0.92%	1.18%	0.25%	1.44%	-0.32%
Z statistic	-0.32	1.29	-1.76	1.97	0.87	2.00	-0.45
Significance				**		**	
3d. Foreign Government (n=38)							
Mean Abnormal							
Return	-0.31%	-0.75%	-0.97%	1.92%	1.02%	2.94%	3.74%
Z statistic	-0.53	-1.42	-1.45	2.14	1.08	2.26	3.50
Significance				**		**	***

Notes: Bold type indicates statistical significance at the *** (0.01), ** (0.05), * (0.10) level. Results are materially the same when using post-event estimation period data.

hypothesis for this sample of contract awards. Table 3 (Panel 3) pertains to all government contracts. The mean abnormal return for day 0, day 1, days 0,1, and days 2-5 are positive. For day 0 and day 1 the mean abnormal returns sum to 2.52% and this cumulative mean abnormal return is statistically significant. The fair contract hypothesis is rejected in favor of the positive net present value hypothesis for the full sample of government contract awards.

Four sections (3a, 3b, 3c, and 3d) under Panel 3 of the table pertain to the different types of governments that awarded contracts to corporations. Panel 3a pertains to non-military contracts awarded by the Federal government. The mean abnormal return on day 0 is 1.56%, which is statistically significant. However, the mean abnormal returns on days 0,1, and days 2-5 are not statistically significant. This suggests the market initially (day 0) overreacted to the contract award announcements. Thus, the fair contract hypothesis is not rejected for this particular sub-sample of government contracts. Panel 3b pertains to U.S. Military contracts. The mean abnormal returns are positive and statistically significant for day 0, day 1, and days 0,1. The cumulative mean abnormal return for days 0,1 is 3.67%. The fair contract hypothesis is rejected in favor of the positive net present value hypothesis for military contracts. Panel 3c discloses the results for the mean abnormal returns for contract awards granted by municipal governments in the U.S. The mean abnormal returns on day 0 and days 0,1 are positive and statistically significant. The fair contract award hypothesis is rejected in favor of the positive net present value hypothesis for this sample of contract award announcements. Panel 3d discloses the results for the mean abnormal returns for contract awards granted by foreign governments. The mean abnormal returns on day 0, days 0,1 and days 2-5 are positive and statistically significant. The mean abnormal return for days 0 through 5 is 6.68% suggesting these contracts are quite lucrative. The fair contract hypothesis is rejected in favor of the positive net present value hypothesis for this sample of contract awards. The positive and statistically significant cumulative abnormal return during days 2-5 suggests the market takes time to fully analyze these contract awards.

The fair contract hypothesis is rejected in favor of the positive net present value hypothesis for all contract awards except those granted by the federal government. These results also suggest contract awards granted by foreign governments may be more lucrative than contract awards granted by corporations or American governments. Finally, the market apparently takes longer (5 days) to fully assess foreign government contracts.

Cross-Sectional Regression Results

Results for the cross-sectional analyses determine if the abnormal returns are conditioned on the grantor while controlling for potentially confounding factors, which are the size (revenue) of the contract, the number of years of the contract's life, the size (total assets) of the grantee, the day of the week (Monday or Friday), and the change in the year (December or January). Table 4 discloses cross-sectional results for three event windows: day 0, days 0,1, and days 2-5. These results should be interpreted with caution, as the F-statistics are insignificant.

The first two columns inside the table pertain to regressing the abnormal returns for day 0 on the independent variables. The sign on the coefficient estimate pursuant to total assets is negative and significant suggesting larger firm stock prices are affected by a lesser degree when contract awards are announced. The third and fourth columns of Table 4 pertain to regressing the cumulative abnormal returns for days 0 and 1 on the independent variables. The sign on the coefficient estimate pursuant to total assets is negative and significant confirming that larger firm stock prices are affected to a lesser degree when contract awards are announced. The coefficient estimate on the dummy variable identifying the contract awards announced on Friday is positive and statistically significant indicating the market perceives contract awards as being more lucrative if announced on Friday. The last two columns of Table 4 pertain to regressing the days 2 through 5 cumulative abnormal returns on the independent variables. The coefficient estimate on the foreign government dummy variable is positive and statistically significant indicating the market perceives these contract awards as being more lucrative than contracts awarded by corporations or other types of government. Thus, the government contract award hypothesis is not rejected for this sample of government contract awards. It takes the

TABLE 4
Least Square Estimates of Cross-Sectional Regressions for 329
Contract Awards, 1/1990-7/1998

Independent Variables	Dependent Variables					
	CAR _{0,1} (day 0)		CAR _{0,2} (days 0,1)		CAR _{2,4} (days 2-5)	
	Coefficient	t-stat.	Coefficient	t-stat.	Coefficient	t-stat.
KSZ	0.0000	0.03	-0.0000	-0.71	-0.0000	-0.55
YRS	-0.0030	-0.19	0.0028	1.03	-0.0000	-0.03
TASST	-0.0001*	-1.65	-0.0002*	-1.73	-0.0000	-0.49
FED	0.0060	0.61	-0.0140	-0.81	-0.0075	-0.47
FORG	0.0104	1.03	0.0122	0.68	0.0436**	2.56
MIL	0.0072	0.93	0.0162	1.20	0.0054	0.43
MUNI	0.0026	0.28	-0.0025	-0.15	0.0018	0.12
MON	0.0059	0.73	0.0016	0.11	0.0094	0.72
FRI	0.0001	0.02	0.0347**	2.08	-0.0071	-0.46
DEC	0.0012	0.10	-0.0028	-0.13	0.0185	0.96
JAN	-0.0049	-0.52	-0.0152	-0.92	0.0122	0.83
Adj R ²	0.0000		0.0067		0.0000	
F-stat	0.47		1.18		0.98	

Notes: Bold type indicates statistical significance at the 0.01 (***), 0.05 (**), and 0.10 (*) level. Adjusting for heteroskedasticity was not necessary. Results are materially the same when using post-event estimation period data.

Legends:

- KSZ = the size (revenue) of the contract
- YRS = the number of years of the contract's life
- TASST = the total assets of the grantee on the previous fiscal year
- FED = a dummy variable equal to 1 if the grantor is the U.S. Federal Government (Civil)
- FORG = a dummy variable equal to 1 if the grantor is a foreign government
- MIL = a dummy variable equal to 1 if the grantor is the U.S. Military
- MUNI = a dummy variable equal to 1 if the grantor is a municipal government
- MON = a dummy variable equal to 1 if the contract announcement were on a Monday
- FRI = a dummy variable equal to 1 if the contract announcement were on a Friday

DEC = a dummy variable equal to 1 if the contract announcement occurred in December

JAN = a dummy variable equal to 1 if the contract announcement occurred in January.

market five days to fully assess contract awards granted by foreign governments.

CONCLUSION

For all contract awards except those issued by the Federal government (non-military), the results suggest the revenue from the contract is expected to exceed all of the costs (operating and financing) associated with the fulfilling the contracts. For Federal government (non-military) contracts, the results indicate the revenue from the contract is expected to sufficiently cover all the costs (operating and financing) associated with fulfilling the contracts.

The returns pursuant to contracts granted by foreign governments are substantially higher than the returns pursuant to contracts granted by American governments or corporations. The cross-sectional analysis suggests the returns for these types of contract awards are significantly higher than the returns pursuant to contracts awarded by other grantors, even when controlling for potentially confounding factors. Apparently, foreign contract awards are particularly lucrative.

Finally, there is no evidence that American governments grant contracts that are more lucrative than those granted by American corporations. This finding is surprising and counter to subjective claims that U.S. government bodies grant particularly lucrative contracts.

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REFERENCES

Chaney, P. K. (1989, Summer). "Moral Hazard and Capital Budgeting." The Journal of Financial Research, 12(2): 113-118.

- Diltz, J. D. (1990). "Valuation Effects of Government Contract Awards." Quarterly Journal of Business and Economics, 29(3): 3-15.
- Errunza, V. R. & Senbet, L. W. (1984). "International Corporate Diversification, Market Valuation, and Size-Adjusted Evidence/Discussion." Journal of Finance, 39: 727-745.
- Fama, E. F. & French, K. R. (1999). "The Corporate Cost of Capital and The Return on Corporate Investment," Journal of Finance, 54(6): 1939-1967.
- French, K. R. (1980). "Stock Returns and the Weekend Effect." Journal of Financial Economics, 8: 55-69.
- Mikkelson, W. H. & Parch, M. M. (1988). "Withdrawn Security Offerings." Journal of Financial and Quantitative Analysis, 23(2): 119-133 and Errata.
- Miller, E. M. (1988, Summer). "Why a Weekend Effect?" Journal of Portfolio Management, 14(4): 43-48.
- Whyte, A. M. & Picou, A. (1993). "Seasonality in Industry Specific Indexes." Journal of Economics and Finance, 17(3): 57-69.
- Woods, J. C. & Randall, M. (1989). "The Net Present Value of Future Investment Opportunities." Financial Management, 18(2): 85-93.