EMPIRICAL RESULTS:

MARKET PRICE EFFECTS OF BUSINESS CONTRACTING

Empirical results in this chapter are divided into three parts. The first part presents the relevant test results of stock market reaction to business contracting. The second part contains results of the stock market reaction to different contract types. The final part briefly sums up the findings. A comparative exploration between the results of this research and the extant empirical findings will be provided in Chapter 5. Results are as follows.

4.1. The Stock Market Reaction to Business Contracting

This section reports three subsection results: average abnormal return (ARR) , cumulative abnormal returns (CAAR), and sensitivity nature of alternative abnormal return measures, as follows.

4.1.1 Average Abnormal Return (ARR)

Values for average abnormal returns (AAR) and associated test statistics surrounding the event date of both the OLS Market Model (MM) and the Capital Asset Pricing Model (CAPM) measures are reported in Table 1. The table reports AAR of the period from 25 days prior to contest announcement through the day of announcement and 25 days following the event day, a period with a mean length of 51 trading days.

Table 4.1: Average Abnormal Returns (AAR)

This table shows the average abnormal returns of stocks surround the announcement period for total sample size of 676 companies during Jan 1994 – Jun 2011. AAR is the Average Abnormal Returns which is computed as

$$AAR_t = \sum_{i=1}^{N} A_{it} / N$$ where A_{it} is the abnormal returns based on the market model (MM) and on the CAPM.

Day	The Market Model (MM)				The Capital Asset Pricing Model (CAPM)			
	AAR (%)	Std. Deviation	Z-stat	*p*-value (2-tailed)	AAR (%)	Std. Deviation	Z-stat	*p*-value (2-tailed)
T-25	0.1720	3.0951	1.4452	0.1489	0.1084	3.0814	0.9142	0.3609
T-24	-0.1932	2.7174	-1.8481	0.0650**	-0.2540	2.6738	-2.4697	0.0138*
T-23	0.2574	3.1915	2.0966	0.0364*	0.1944	3.1552	1.6016	0.1097
T-22	-0.0242	3.4003	-0.1849	0.8534	-0.0842	3.4263	-0.6389	0.5231
T-21	-0.1932	3.0460	-1.6495	0.0995**	-0.2487	3.0498	-2.1199	0.0344*
T-20	0.2501	3.1120	2.0896	0.0370*	0.1891	3.0874	1.5926	0.1117
T-19	0.1773	3.1443	1.4660	0.1431	0.1204	3.1424	0.9958	0.3197
T-18	-0.0255	2.8852	-0.2295	0.8185	-0.0794	2.8649	-0.7204	0.4715
T-17	-0.0699	3.3333	-0.5456	0.5856	-0.1243	3.3287	-0.9713	0.3318
T-16	0.0747	3.9414	0.4930	0.6222	0.0219	3.9715	0.1431	0.8863
T-15	-0.1620	2.9734	-1.4164	0.1571	-0.2148	2.9474	-1.8944	0.0586**
T-14	-0.1055	3.0527	-0.8990	0.3690	-0.1584	3.0424	-1.3534	0.1764
T-13	0.0393	3.6186	0.2822	0.7779	-0.0139	3.5797	-0.1011	0.9195
T-12	0.0100	3.2903	0.0789	0.9372	-0.0423	3.2833	-0.3352	0.7375
T-11	-0.0763	3.4593	-0.5737	0.5664	-0.1296	3.4537	-0.9757	0.3295
T-10	-0.1765	2.9700	-1.5455	0.1227	-0.2281	2.9507	-2.0102	0.0448*
T-9	0.1150	3.3277	0.8983	0.3693	0.0624	3.3147	0.4898	0.6245
T-8	-0.1817	2.9990	-1.5757	0.1156	-0.2338	2.9845	-2.0370	0.0420*
T-7	0.1914	3.4245	1.4531	0.1467	0.1373	3.4448	1.0361	0.3005
T-6	0.0302	2.9670	0.2643	0.7916	-0.0243	2.9692	-0.2128	0.8316
T-5	0.2482	3.0850	2.0917	0.0368*	0.1926	3.0889	1.6210	0.1055
T-4	-0.0432	3.0708	-0.3658	0.7146	-0.0965	3.0707	-0.8174	0.4140
T-3	0.2107	3.2406	1.6903	0.0914**	0.1590	3.2037	1.2905	0.1973
T-2	0.0935	3.5102	0.6923	0.4890	0.0460	3.4976	0.3419	0.7325
T-1	-0.0717	3.1829	-0.5855	0.5584	-0.1156	3.1445	-0.9561	0.3393
T$_0$	0.5145	3.5526	3.7658	0.0002*	0.4685	3.5535	3.4278	0.0006*
T+1	0.3383	3.1779	2.7674	0.0058*	0.2964	3.1348	2.4586	0.0142*
T+2	-0.2032	3.4352	-1.5381	0.1245	-0.2415	3.4149	-1.8389	0.0664**
T+3	0.2888	3.2428	2.3157	0.0209*	0.2476	3.2556	1.9771	0.0484*
T+4	0.1567	3.5486	1.1482	0.2513	0.1173	3.5041	0.8706	0.3843
T+5	0.1561	2.8788	1.4100	0.1590	0.1167	2.8913	1.0495	0.2943
T+6	0.3673	3.7012	2.5805	0.0101*	0.3309	3.7266	2.3087	0.0213*
T+7	0.1745	3.3786	1.3431	0.1797	0.1411	3.3985	1.0795	0.2807
T+8	-0.2440	3.4061	-1.8626	0.0630**	-0.2758	3.4002	-2.1090	0.0353*
T+9	0.0509	3.4172	0.3876	0.6985	0.0192	3.4025	0.1469	0.8833
T+10	0.2232	3.3053	1.7557	0.0796**	0.1917	3.3213	1.5003	0.1340
T+11	0.2274	3.8707	1.5274	0.1271	0.1989	3.8986	1.3265	0.1851
T+12	-0.3614	3.4386	-2.7326	0.0064*	-0.3883	3.4199	-2.9523	0.0033*

(cont.)

Table 4.1 (cont.)

Day	The Market Model (MM)				The Capital Asset Pricing Model (CAPM)			
	AAR (%)	Std. Deviation	Z-stat	*p*-value (2-tailed)	AAR (%)	Std. Deviation	Z-stat	*p*-value (2-tailed)
T+13	-0.3327	3.5167	-2.4598	0.0142*	-0.3630	3.5223	-2.6798	0.0075*
T+14	-0.3176	3.3705	-2.4497	0.0146*	-0.3478	3.3626	-2.6895	0.0073*
T+15	0.0103	3.6379	0.0738	0.9412	-0.0219	3.6494	-0.1561	0.8760
T+16	-0.2477	3.2802	-1.9635	0.0500**	-0.2801	3.2971	-2.2085	0.0275*
T+17	-0.0531	2.9793	-0.4633	0.6433	-0.0878	2.9728	-0.7682	0.4426
T+18	0.0353	3.4406	0.2665	0.7899	0.0013	3.4241	0.0099	0.9921
T+19	0.0047	3.1283	0.0387	0.9691	-0.0296	3.1220	-0.2467	0.8052
T+20	-0.3296	3.2331	-2.6509	0.0082*	-0.3667	3.1677	-3.0097	0.0027*
T+21	-0.0206	3.2881	-0.1633	0.8703	-0.0623	3.3298	-0.4866	0.6267
T+22	0.2759	3.4647	2.0706	0.0388*	0.2354	3.4803	1.7584	0.0791**
T+23	-0.0636	2.6842	-0.6158	0.5382	-0.1012	2.6498	-0.9930	0.3211
T+24	-0.3111	3.1702	-2.5512	0.0110*	-0.3497	3.1585	-2.8785	0.0041*
T+25	0.1214	3.1864	0.9902	0.3224	0.0801	3.1882	0.6533	0.5138

Note * significant at the 0.05 level
      ** significant at the 0.10 level

Results from MM and CAPM measures show statistically significant positive abnormal returns on the announcement day (T_0) and one day following the announcement day (T_{+1}). The positive abnormal performances are also documented on three days following the announcement day (T_{+3}). As reported in Table 4.1, on the announcement day, an AAR of MM is 0.5145 percent with a Z value of 3.7658 and an ARR of CAPM is 0.4685 percent with a Z value of 3.4278. The ARR and Z value results as measured by MM on the day following the announcement day are 0.3383 percent with a Z value of 2.7674 and as measured by CAPM are 0.2964 percent with a Z value of 2.4586.

Although there is a significant negative average abnormal return of -0.2415 percent (CAPM) on two days after the announcement day (T_{+2}), positive average abnormal return of 0.2888 percent (MM) with a Z value of 2.3157 and positive average abnormal return of 0.2476 (CAPM) with a Z value of 1.9771 for three days following the announcement day are documented. Furthermore, both measures show significant positive abnormal returns on six

days following the announcement day (T_{+6}), while significantly negative average abnormal returns are found in day 8, 12, 13, 14, 16 and 20 after the announcement day. In contrast, there appears to be unsystematically abnormal return associated with the days before the announcement of business contract.

The results in general suggest that announcement of business contract, once revealed to the market, is capitalized rapidly into the firm's stock price.

4.1.2 Cumulative abnormal returns: CAAR

Table 4.2 reports the mean cumulative abnormal return (CAAR) for various time intervals and associated test statistics of both the Market Model (MM) and the Capital Asset Pricing Model (CAPM) measures.

Table 4.2: Cumulative Average Abnormal Returns (CAAR) and Statistics surrounding the Announcement Day measured by MM and CAPM (sample size: 676, time period: January 1994 – June 2011)

Interval	The Market Model (MM)				The Capital Asset Pricing Model (CAPM)			
	CAAR (%)	Std. Deviation	Z-stat	p-value (2-tailed)	CAAR (%)	Std. Deviation	Z-stat	p-value (2-tailed)
CAAR ±3	1.1709	8.9677	3.3947	0.0007*	0.8603	8.9006	2.5132	0.0122**
CAAR ±10	2.2389	15.8916	3.6631	0.0003*	1.3110	16.5720	2.0568	0.0401**
CAAR ±25	1.0074	23.2979	1.1242	0.2613	-1.2874	27.4232	-1.2206	0.2227

Note * significant at the 0.01 level
         ** significant at the 0.05 level

As measured by the Market Model (MM), the mean CAAR over ± 3 days surrounding the announcement day is 1.1709 percent with a Z value of 3.3947, statistically significant at the 0.01 level. The mean CAAR results of the ± 10 days surrounding the announcement day are

inconsistent with those in the ± 3 days results. The mean CAAR over ± 10 days is 2.2389 percent with the Z value of 3.6631, which is statistically significant at the 0.01 level.

The mean CAAR results of the CAPM measure are consistent with the MM results. The significantly positive means are found both in the ± 3 and ± 10 days surrounding the announcement day. The mean CAAR over ± 3 days is 0.8603 percent with a Z value of 2.5132 and the mean CAAR results of ± 10 days is 1.3110 percent with the Z value of 2.0568, both results are statistically significant at the 0.05 level. In contrast, there appears to be no significant cumulative abnormal return associated with the ± 25 days surrounding the announcement day.

The results from event study of the entire sample rejects the Hypothesis 1 (H_{01}): The expected value of the cumulative average abnormal return is equal to zero, meaning there are abnormal returns surrounding the announcements of business contracting. The announcement of a business contract signals to the capital market that the firm offers a good investment opportunity. A better prospect of future cash flows is immediately translated into positive stock price reactions.

4.1.3 Sensitivity Nature of Alternative Abnormal Return Measures

It is essential to verify if the abnormal return revealed by alternative measures was dependent upon an abnormal return measured. Accordingly, this section examines the sensitivity of using two abnormal return measures, the MM and the CAPM. Sensitivity of using alternative measures can be verified by using the correlation coefficient value of the average abnormal return parameters across news. Results of these procedures are reported in Tables 4.3.

Table 4.3: Matrix of Pearson Correlation between Abnormal Return Measures, ±25 day

Pearson Correlation: MM vs. CAPM		The Market Model (MM)	The Capital Asset Pricing Model (CAPM)
The Market Model (MM)	Pearson Correlation	1	0.9999
	p-value (2-tailed)	-	0.0000*
	N	51	51
The Capital Asset Pricing Model (CAPM)	Pearson Correlation	0.9999	1
	p-value (2-tailed)	0.0000*	-
	N	51	51

Note * significant at the 0.01 level

Pearson's correlation coefficient is used to reveal the association between the average abnormal return (ARR) of MM and CAPM measures. Table 4.3 contains the matrix of correlation coefficients for AAR results, and associated probability (two-tail analysis). The significant value of Pearson coefficient, 0.9999 is reported and probability is less than 0.01. This confirms the rejection of the Hypothesis 2 (H_{02}). The abnormal return result as measured by the MM and CAPM measures are significantly correlated, indicating that there is no sensitivity to the use of alternative abnormal return measures. Please note that the statistical test for normal distribution before using Pearson Correlation is reported in Chapter 4's Appendix.

Figure 4.1 illustrates the line chart of AAR results of MM and CAPM measures, ± 25 days surrounding the announcement day. The figure confirms the similar direction of the average abnormal return (ARR) of MM and CAPM results.

Figure 4.1: AAR as measured by the MM and CAPM:
±25 days surrounding the announcement day
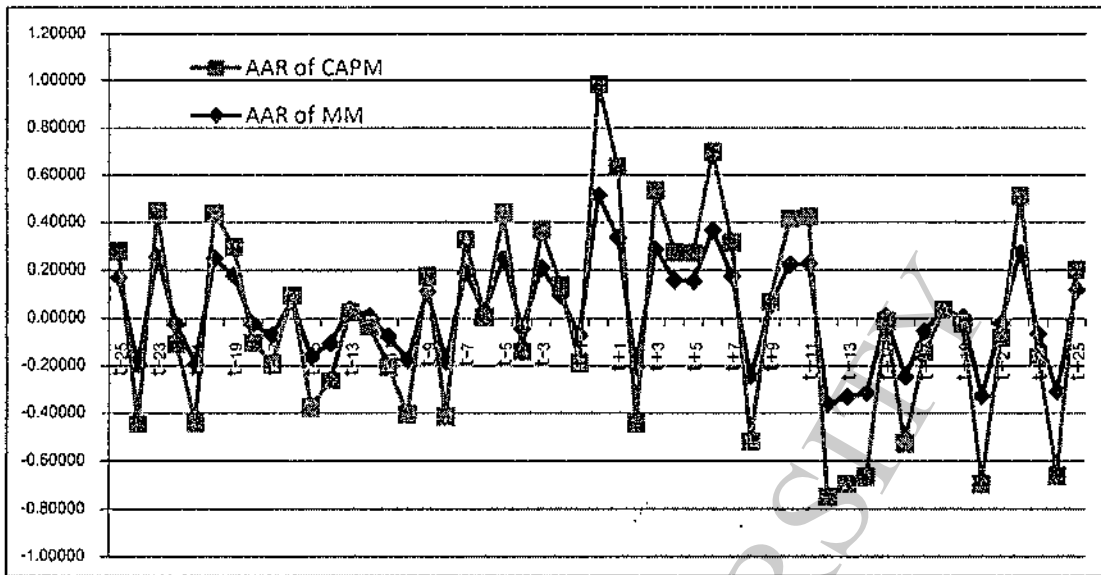
4.2. Types of Contracting

An event study was also run to compare the results of subsamples according to the types of

contracts and to test whether there is any significant difference among their abnormal returns.

The subsamples are included (1) government contract vs. corporate contract and (2) five

different contract sizes.

4.2.1 The Stock Market Reaction to Government Contracts vs. Corporate Contracts

4.2.1.1 AAR: Government Contracts vs. Corporate Contracts

Table 4.4 provides a summary of daily abnormal returns of government contracts and

corporate contracts around the announcement day from both MM and CAPM measures, and

the Z-statistics testing if the ARR is significantly different from zero are also reported. The

results from Table 4.4 reinforce the general impression gained from Table 4.1 that there are

significant positive abnormal returns on the announcement day (T_0) of both government and

corporate contracts, indicating that business contracts both due with government and

corporate company, signal to investors that a firm has good investment opportunities which immediately translates into positive price reactions.

Table 4.4: Average Abnormal Returns (AAR) and Statistics around the Announcement Day measured by MM and CAPM: Government Contracts vs. Corporate Contracts

| Day | Government Contracts (N=388) | | | | Corporate Contracts (N=284) | | | |
| | MM | | CAPM | | MM | | CAPM | |
	AAR (%)	Z-stat (2-tailed)	AAR (%)	Z-stat (2-tailed)	AAR (%)	Z-stat (2-tailed)	AAR (%)	Z-stat (2-tailed)
T-25	0.1804	1.1036	0.1185	0.7236	0.1693	0.9692	0.1009	0.5862
T-24	-0.3084	-2.2778*	-0.3670	-2.7570*	-0.0932	-0.5729	-0.1590	-0.9948
T-23	0.2473	1.4937	0.1862	1.1415	0.2834	1.5318	0.2148	1.1688
T-22	0.0076	0.0495	-0.0509	-0.3278	-0.0813	-0.3532	-0.1466	-0.6346
T-21	-0.3089	-2.2089*	-0.3619	-2.6062*	-0.0175	-0.0865	-0.0795	-0.3888
T-20	0.3001	2.0271*	0.2414	1.6384	0.2125	1.0612	0.1456	0.7347
T-19	-0.0378	-0.2507	-0.0921	-0.6038	0.5369	2.7364*	0.4736	2.4455*
T-18	0.0240	0.1719	-0.0296	-0.2138	-0.0981	-0.5379	-0.1543	-0.8518
T-17	-0.1276	-0.9397	-0.1822	-1.3543	0.0008	0.0033	-0.0554	-0.2279
T-16	-0.0689	-0.4452	-0.1224	-0.7919	0.2895	0.9914	0.2352	0.7953
T-15	-0.2606	-1.8556**	-0.3146	-2.2592*	-0.0348	-0.1802	-0.0879	-0.4600
T-14	0.1263	0.8710	0.0721	0.4967	-0.4096	-2.0933*	-0.4629	-2.3817*
T-13	0.2243	1.4128	0.1725	1.0961	-0.2104	-0.8417	-0.2679	-1.0855
T-12	-0.1675	-1.0540	-0.2176	-1.3676	0.2547	1.2240	0.1971	0.9524
T-11	-0.0832	-0.4690	-0.1343	-0.7565	-0.0624	-0.3060	-0.1211	-0.5965
T-10	-0.2029	-1.3951	-0.2543	-1.7481**	-0.1596	-0.8624	-0.2142	-1.1742
T-9	0.0310	0.2022	-0.0215	-0.1415	0.2241	1.0117	0.1683	0.7603
T-8	-0.4119	-2.9878*	-0.4617	-3.3857*	0.1515	0.7655	0.0927	0.4677
T-7	0.2393	1.3903	0.1868	1.0785	0.1421	0.6908	0.0826	0.3990
T-6	0.1687	1.2319	0.1169	0.8528	-0.1517	-0.7717	-0.2123	-1.0788
T-5	-0.0710	-0.4715	-0.1244	-0.8297	0.7053	3.7065*	0.6440	3.3551*
T-4	0.1006	0.6369	0.0468	0.2961	-0.2106	-1.1763	-0.2657	-1.4848
T-3	0.3474	2.1940*	0.2960	1.8800**	0.0717	0.3576	0.0174	0.0885
T-2	0.2504	1.4634	0.2022	1.1841	-0.1173	-0.5330	-0.1654	-0.7551
T-1	-0.1188	-0.7166	-0.1612	-0.9860	-0.0070	-0.0384	-0.0549	-0.3026
T₀	0.4348	2.4375*	0.3898	2.2083*	0.6348	2.9583*	0.5855	2.6927*
T+1	0.2742	1.5770	0.2325	1.3536	0.4180	2.4937*	0.3747	2.2754*
T+2	-0.2907	-2.0637*	-0.3306	-2.3710*	-0.0580	-0.2334	-0.0955	-0.3859
T+3	0.0610	0.4119	0.0186	0.1259	0.5481	2.5692*	0.5070	2.3521*
T+4	0.0654	0.3889	0.0237	0.1434	0.3184	1.3908	0.2803	1.2351
T+5	-0.0563	-0.4090	-0.0988	-0.7154	0.4343	2.3693*	0.3978	2.1576*
T+6	0.1829	1.0932	0.1399	0.8298	0.6135	2.4595*	0.5848	2.3293*
T+7	0.0539	0.3081	0.0137	0.0776	0.3605	1.8430**	0.3347	1.7055**
T+8	-0.3533	-2.0814*	-0.3912	-2.2926*	-0.1075	-0.5164	-0.1327	-0.6439

(cont.)

Table4. 4: (cont.)

| Day | Government Contracts (N=388) | | | | Corporate Contracts (N=284) | | | |
| | MM | | CAPM | | MM | | CAPM | |
	AAR (%)	Z-stat (2-tailed)	AAR (%)	Z-stat (2-tailed)	AAR (%)	Z-stat (2-tailed)	AAR (%)	Z-stat (2-tailed)
T+9	0.1687	1.0335	0.1279	0.7924	-0.1197	-0.5475	-0.1408	-0.6421
T+10	0.0435	0.2782	0.0047	0.0296	0.4715	2.2061*	0.4481	2.0917*
T+11	0.0227	0.1286	-0.0144	-0.0816	0.4547	1.7653**	0.4368	1.6754**
T+12	-0.2498	-1.4998	-0.2858	-1.7129**	-0.5124	-2.3569*	-0.5283	-2.4628*
T+13	-0.3234	-1.8161**	-0.3596	-2.0060*	-0.3648	-1.7290**	-0.3889	-1.8540**
T+14	-0.5417	-3.1150*	-0.5782	-3.3233*	0.0032	0.0164	-0.0205	-0.1065
T+15	-0.0277	-0.1793	-0.0698	-0.4437	0.1017	0.3966	0.0818	0.3208
T+16	-0.1908	-1.0915	-0.2348	-1.3295	-0.3008	-1.6704**	-0.3178	-1.7704**
T+17	-0.1630	-1.2017	-0.2084	-1.5333	0.0969	0.4842	0.0765	0.3846
T+18	0.1263	0.7500	0.0801	0.4785	-0.0894	-0.4154	-0.1069	-0.4983
T+19	-0.0078	-0.0499	-0.0548	-0.3557	0.0345	0.1800	0.0169	0.0874
T+20	-0.4639	-3.3102*	-0.5122	-3.7175*	-0.1775	-0.7917	-0.1994	-0.9107
T+21	-0.0685	-0.4678	-0.1224	-0.8422	0.0278	0.1238	0.0023	0.0100
T+22	0.1662	1.0689	0.1107	0.7182	0.4164	1.7674**	0.3953	1.6541**
T+23	-0.1247	-0.9757	-0.1772	-1.3639	0.0312	0.1802	0.0128	0.0776
T+24	-0.1178	-0.8043	-0.1714	-1.1828	-0.5655	-2.7008*	-0.5841	-2.7805*
T+25	0.1448	1.0307	0.0902	0.6409	0.0945	0.4300	0.0713	0.3244

Note * significant at the 0.05 level
  ** significant at the 0.10 level
  N.A. 4 contract announcement.

Results of corporate contracts of both measures also show strong significantly positive AAR on the days following announcement day, which are day 1(T_{+1}), day 3 (T_{+3}), day 5 (T_{+5}), day 6 (T_{+6}), day 7 (T_{+7}), day 10 (T_{+10}), day 11 (T_{+11}), and day 22 (T_{+22}). In contrast, results of government contracts did not find any significant positive AAR after the event day. It is also interesting to note that result from MM measure indicates statistically significant positive abnormal returns on three days (T_{-3}) prior to the announcement day (T_0), while CAPM shows positive abnormal performances on five days (T_{-5}) prior to the announcement day.

In general, the results suggest that announcements of business contracts with both government and corporate firms, once announced into the market, are capitalized rapidly into the firm's stock price within the announcement day. Contracts with corporate firms provided

significant positive AAR for several days following the event day (T_0), while none significant

positive AAR was found for the government contracts after the announcement day.

4.2.1.2 CAAR: Government Contracts vs. Corporate Contracts

Table 4.5 reports the mean cumulative abnormal return (CAAR) of government and corporate

contracts for various time intervals and associated test statistics of both the Market Model

(MM) and the Capital Asset Pricing Model (CAPM) measures.

Table 4.5: Stock Market Reactions on the Basis of Contract Types: Government Contracts vs. Corporate Contracts

Means of cumulative average Abnormal Returns (CAAR) and statistics surrounding the announcement Day as measured by MM and CAPM are reported.

The Market Model (MM)								
	Government Contracts (N=388)				Corporate Contracts (N=284)			
Interval	CAAR (%)	Std. Deviation	Z-stat	p-value (2-tailed)	CAAR (%)	Std. Deviation	Z-stat	p-value (2-tailed)
CAAR ±3	0.9582	8.9248	2.1148	0.0351**	1.4908	9.0719	2.7693	0.0060*
CAAR ±10	0.9171	14.7499	1.2247	0.2214	4.1623	17.2030	4.0775	0.0001*
CAAR ±25	-1.1551	23.7970	-0.9561	0.3396	4.1525	22.3100	3.1367	0.0019*
The Capital Asset Pricing Model (CAPM)								
	Government Contracts (N=388)				Corporate Contracts (N=284)			
Interval	CAAR (%)	Std. Deviation	Z-stat	p-value (2-tailed)	CAAR (%)	Std. Deviation	Z-stat	p-value (2-tailed)
CAAR ±3	0.6471	8.7176	1.4622	0.1445	1.1691	9.1820	2.1457	0.0327**
CAAR ±10	-0.0443	14.9324	-0.0584	0.9534	3.2365	18.5193	2.9452	0.0035*
CAAR ±25	-3.6343	26.9904	-2.6523	0.0083*	2.0168	27.8937	1.2185	0.2241

Note *   significant at the 0.01 level
      ** significant at the 0.05 level
          N.A. 4 contract announcement.

As measured by the Market Model (MM), the mean CAAR of government contracts over ± 3 days surrounding the announcement day is 0.9582 percent with a Z value of 2.1148, statistically significant at the 0.05 level. However, there is no evidence of significant statistic on the mean CAAR results of the ± 10 days and ± 25 surrounding the announcement day, which is inconsistent with results as measured by CAPM. A significant negative CAAR of the ± 25 day results are found, where the mean CAAR over ± 25 days is -3.646 percent with the Z value of -2.6523, which is statistically significant at the 0.01 level.

The mean CAAR results of corporate contracts, as measured by the MM, show significantly positive means in all intervals: ± 3, ± 10 and ± 25 days surrounding the announcement day with means CAAR of 1.4908, 4.1623, and 4.1525 percent, respectively. All means CAAR results are statistically significant at the 0.01 level. When the means CAAR of corporate contracts are measured by the CAPM, significant positive CAAR are documented for ± 3 and ± 10 day surrounding the event day. The mean CAAR of ± 3 days is 1.1691 percent with a Z value of 2.1457, while the mean CAAR of ± 10 days is 3.2365 percent with a Z value of 2.9452.

Almost all results from event study on the subsample of corporate contracts confirm the rejection of the Hypothesis 1 (H_{01}): The expected value of the cumulative average abnormal return is equal to zero. This means that there are cumulative abnormal returns surrounding the announcements of business contracts when firms sign business contract with corporate firms. It should be noted that when firms sign contracts with government agencies, only ± 3 days interval is found for a positive accumulate abnormal return surrounding the announcement day.

4.2.1.3 Different Abnormal Return between Government and Corporate

It is essential to verify whether the abnormal return results to firms engaging in government

contracts compared to returns to firms in corporate contracts are different. Third null

hypothesis A (H_{03a}) forms the basis for the test of difference on abnormal return from the

announcement of both contract types. The difference can be verified by comparing the mean

value of daily AAR. Comparison of the mean value of daily AAR parameters is conducted

using the paired mean difference statistic between two types of contracts. Results of the

procedures are reported in Table 4.6.

Table 4.6: Mean Paired Difference of Average Abnormal Rate (AAR): Government
Contracts vs. Corporate Contracts as Measured by MM and CAPM

Measures	Mean paired differences	Std. error mean	t-test	p-value
MM	-0.1041	0.0421	-2.4703	0.0170*
CAPM	-0.1108	0.0420	-2.6365	0.0111*

Note * significant at the 0.05 level

Table 4.6 shows the significance of the average difference of the ARR from MM and CAPM

measures. The estimated mean of the paired means difference of MM is -0.1041 and CAPM

is -0.1108. The p-values corresponding to the mean paired difference of 0.0170 and 0.0111,

respectively, reject the H_{03a} at the 0.05 level of significance. Hence, using the estimation of

AAR of government and corporate contracts differ significantly.

4.2.2 The Stock Market Reaction to Budget of the Business Contacts

To examine market reactions to different types of contract announcements with different

abnormal returns, the contracts are divided into five groups as explained in the definition in

Chapter I. The five contract sizes are XS, S, M, L, and XL. The results of five different contract sizes are as follows.

4.2.2.1 AAR: Five Different Contract Sizes

Table 4.7 and Table 4.8 provide summary results on daily abnormal returns of five different size contracts and the Z-statistics testing if the ARR is significantly different from zero, MM and CAPM measures, respectively. The results from both tables reinforce the general impression gained from Table 4.1 that there are significant positive abnormal returns on the announcement day (T_0) of the S, M and XL contract sizes. These results indicate that business contracts signal to investors that a firm offers a good investment opportunity, which is immediately translated into positive price reactions.

Table 4.7: Average Abnormal Returns (AAR) and Statistics around the Announcement Day: Five Different Contract Sizes as Measured by MM

Day	XS (N = 131)		S (N = 130)		M (N = 131)		L (N = 126)		XL (N = 131)	
	AAR (%)	Z-stat (2-tailed)	AAR (%)	Z-stat (2-tailed)	AAR (%)	Z-stat (2-tailed)	AAR (%)	Z-stat (2-tailed)	AAR (%)	Z-stat (2-tailed)
T-25	0.0802	0.2811	0.3242	1.0270	0.1766	0.7033	0.2116	0.7661	0.1315	0.5021
T-24	0.0377	0.1724	-0.0706	-0.2329	-0.3430	-1.4126	-0.1809	-0.8220	-0.5293	-0.7376
T-23	0.9987	3.1991*	0.3758	1.4089	0.0616	0.2327	-0.3783	-1.6873**	0.2130	-1.5298
T-22	-0.6847	-1.8631**	0.2379	0.8081	-0.0128	-0.0453	0.3127	1.1846	0.1162	1.0691
T-21	-0.2723	-1.0703	0.3132	1.0730	-0.0581	-0.2350	0.1901	0.6082	-1.0350	0.5004
T-20	0.9323	3.6426*	0.3344	1.1924	-0.2147	-0.6494	0.1213	0.4953	0.2729	0.2935
T-19	0.9576	3.1095*	0.4300	1.7306**	-0.1008	-0.3704*	-0.0767	-0.3090	-0.1596	-0.5138
T-18	-0.4068	-1.6677**	0.4107	1.4696	0.1447	0.6383	-0.1538	-0.6031	-0.2162	-0.4392
T-17	-0.8981	-2.9064*	0.0451	0.1458	0.3908	1.2982	-0.1733	-0.7286	0.4437	-0.9925
T-16	-0.1965	-0.5912	0.3684	0.9480	0.1902	0.5208	-0.0939	-0.2867	0.0559	-0.1000
T-15	0.1541	0.6710	-0.1818	-0.6016	-0.2353	-0.8583	-0.1918	-0.7743	-0.3361	-1.3309
T-14	0.0978	0.3968	-0.0541	-0.1818	-0.1040	-0.4091	0.1319	0.5134	-0.5826	0.5521
T-13	0.0037	0.0126	-0.1337	-0.3534	-0.1894	-0.7149	-0.0573	-0.1872	0.7729	-0.7552
T-12	0.2366	1.1262	-0.4984	-1.2895	0.1493	0.4988	0.1522	0.4940	-0.1289	0.8284
T-11	-0.0171	-0.0452	-0.4683	-1.2726	0.1493	0.5802	-0.2921	-1.2974	0.1605	-1.2074
T-10	-0.7964	-2.8515*	-0.1597	-0.6073	-0.1399	-0.5666	0.3591	1.4532	-0.1457	1.3318
T-9	0.3972	1.2703	-0.0296	-0.0930	-0.0866	-0.3613	0.4062	1.2706	-0.0711	1.3574
T-8	-0.2981	-1.4957	0.3390	1.2996	-0.0764	-0.2434	-0.3038	-1.1879	-0.4514	-1.2586

Table 4.7 (cont.)

Day	XS (N = 131)		S (N = 130)		M (N = 131)		L (N = 126)		XL (N = 131)	
	AAR (%)	Z-stat (2-tailed)	AAR (%)	Z-stat (2-tailed)	AAR (%)	Z-stat (2-tailed)	AAR (%)	Z-stat (2-tailed)	AAR (%)	Z-stat (2-tailed)
T-7	0.0628	0.2466	0.5417	1.8440**	0.0207	0.0699	0.2727	0.8021	0.0934	0.7808
T-6	0.3344	1.3627	-0.1688	-0.5615	-0.1187	-0.5007	-0.1761	-0.5832	0.1989	-0.4986
T-5	0.6583	2.4477*	0.0960	0.3383	0.4480	1.6065	-0.2639	-0.9212	0.3051	-0.7838
T-4	0.0205	0.0914	-0.0254	-0.0942	-0.2119	-0.8833	-0.2201	-0.5794	0.2349	-0.4969
T-3	0.3474	1.1836	0.0297	0.0944	0.1191	0.4683	0.7311	2.5684*	-0.2989	2.9721*
T-2	0.2763	0.8598	0.2076	0.6531	0.0190	0.0591	-0.0326	-0.1039	0.0693	-0.2401
T-1	0.1882	0.8502	-0.5059	-1.9757**	-0.4104	-1.1030	-0.2155	-0.9039	0.3101	-0.3026
T₀	-0.0989	-0.3295	0.7233	2.3540*	0.8073	2.5549*	0.3184	1.2221	0.6827	1.6892**
T+1	0.0968	0.4429	0.4869	1.6160	0.2215	0.7491	0.2580	1.0708	0.6101	1.6006
T+2	0.3847	1.0219	-0.3786	-1.1691	-0.6174	-2.1668*	-0.2621	-1.3770	-0.1778	-1.2394
T+3	0.7987	2.6351*	0.2717	0.8762	0.2793	1.0997	0.1454	0.5952	-0.1032	1.1202
T+4	0.3259	1.2111	0.4821	1.7881**	-0.1068	-0.2539	0.0390	0.1374	0.1204	-0.0016
T+5	0.8338	3.1023*	0.1167	0.5089	0.1978	0.7340	-0.2596	-1.0336	-0.0650	-0.7836
T+6	0.5434	1.3281	0.0131	0.0571	0.7224	2.6273*	0.7665	2.5743*	-0.1937	2.3518*
T+7	0.5115	1.7871**	0.0306	0.1065	0.0315	0.1292	0.2073	0.5945	0.0326	0.6599
T+8	-0.6910	-2.2624*	-0.3910	-1.5359	-0.4140	-1.5240	-0.0719	-0.2310	0.1157	0.5845
T+9	-0.4388	-1.3259	0.3255	1.0183	0.2739	1.0189	0.4678	1.4721	-0.1795	0.9067
T+10	0.9898	2.4405*	0.0378	0.1435	0.1795	0.7008	-0.0243	-0.0912	-0.0091	0.0839
T+11	0.3057	0.8149	0.1253	0.4682	0.5214	1.6652**	-0.0942	-0.2032	0.2471	0.1270
T+12	-0.1580	-0.5945	-0.5390	-1.8161**	-0.6434	-2.6023*	-0.0682	-0.1847	-0.4683	-0.5175
T+13	-0.5461	-1.7146**	-0.4729	-1.5026	-0.1022	-0.3814	-0.4365	-1.0861	-0.2279	-1.1868
T+14	-0.1040	-0.3452	-0.0131	-0.0503	-0.6789	-2.9701*	-0.3218	-0.8040	-0.2767	-0.9629
T+15	-0.1541	-0.4110	0.2250	0.6324	0.0352	0.1276	0.0699	0.2004	-0.0351	0.2874
T+16	-0.4241	-1.7116**	-0.4559	-2.2461*	-0.0943	-0.2813	0.1747	0.5613	-0.1733	0.3736
T+17	-0.2969	-1.2450	0.3906	1.4116	-0.0447	-0.1842	-0.0175	-0.0573	-0.2525	-0.1169
T+18	0.2962	0.8637	0.3924	1.5244	0.0339	0.1108	-0.5535	-2.0770*	-0.0229	-1.6979**
T+19	-0.0313	-0.1231	0.0163	0.0586	0.1488	0.6210	-0.3218	-1.1034	0.1931	-1.1837
T+20	-0.6140	-2.0556**	-0.1705	-0.5234	0.0610	0.2035	-0.2960	-1.2138	-0.6189	-1.1283
T+21	0.1132	0.3591	-0.1119	-0.4095	-0.0820	-0.2561	0.2995	1.0848	-0.1903	0.6411
T+22	0.6627	2.0006*	-0.0177	-0.0492	0.3519	1.2051	0.0249	0.0968	0.3670	0.0093
T+23	0.0709	0.4305	-0.2327	-0.7645	0.2263	1.0636	-0.3901	-1.7127**	-0.0473	-0.8885
T+24	-0.8631	-2.8127*	-0.7351	-2.9918*	0.1243	0.4207	-0.1821	-0.7341	-0.1084	-0.4341
T+25	0.6058	2.4509*	-0.1445	-0.5409	0.0055	0.0166	0.0173	0.0698	0.1711	-0.1236

Note   *   significant at the 0.05 level
        ** significant at the 0.10 level
        N.A. 27 contract announcements.

Although both measures indicate the absence of significant abnormal return of the XS size contract on the announcement day, the statistically significant positive abnormal returns on three days (T_{+3}) following the announcement day (T_0) is documented by both measures,

indicating the delay response of investors on the announcement of the XS contract size. It should be noted that significant negative and positive abnormal return are scattered around the event period of the XS contract size.

Table 4.8: Average Abnormal Returns (AAR) and Statistics around the Announcement Day: Five Different Contract Sizes as Measured by CAPM

Day	XS (N = 131)		S (N = 130)		M (N = 131)		L (N = 126)		XL (N = 131)	
	AAR (%)	Z-stat (2-tailed)	AAR (%)	Z-stat (2-tailed)	AAR (%)	Z-stat (2-tailed)	AAR (%)	Z-stat (2-tailed)	AAR (%)	Z-stat (2-tailed)
T-25	-0.0242	-0.0845	0.2466	0.7917	0.0801	0.3185	0.2020	0.7337	0.0934	0.3777
T-24	-0.0664	-0.3050	-0.1463	-0.4918	-0.4383	-1.8458**	-0.1804	-0.8454	-0.5649	-2.6962*
T-23	0.8958	2.8627*	0.2985	1.1396	-0.0385	-0.1499	-0.3763	-1.7121**	0.1695	0.5176
T-22	-0.7777	-2.1328*	0.1685	0.5629	-0.1157	-0.4023	0.3152	1.1658	0.0727	0.2521
T-21	-0.3642	-1.4194	0.2516	0.8578	-0.1586	-0.6542	0.2037	0.6550	-1.0755	-4.5982*
T-20	0.8339	3.2971*	0.2745	0.9966	-0.3215	-0.9791	0.1297	0.5316	0.2209	0.8904
T-19	0.8707	2.8616*	0.3752	1.4939	-0.2076	-0.7657	-0.0668	-0.2691	-0.2076	-0.6901
T-18	-0.4863	-2.0015*	0.3660	1.3324	0.0373	0.1663	-0.1472	-0.5799	-0.2633	-0.9870
T-17	-0.9835	-3.2296*	0.0023	0.0076	0.2811	0.9320	-0.1618	-0.6809	0.3938	1.2812
T-16	-0.2863	-0.8594	0.3286	0.8304	0.0825	0.2264	-0.0823	-0.2499	0.0159	0.0480
T-15	0.0617	0.2697	-0.2213	-0.7451	-0.3383	-1.2347	-0.1860	-0.7547	-0.3739	-1.6117
T-14	0.0079	0.0319	-0.0936	-0.3228	-0.2067	-0.8153	0.1367	0.5264	-0.6219	-2.0906*
T-13	-0.0881	-0.3100	-0.1731	-0.4697	-0.2919	-1.0950	-0.0483	-0.1588	0.7287	2.3322*
T-12	0.1499	0.7049	-0.5356	-1.3925	0.0444	0.1515	0.1600	0.5181	-0.1706	-0.7335
T-11	-0.0999	-0.2655	-0.5096	-1.3719	0.0419	0.1624	-0.2806	-1.2594	0.1138	0.4208
T-10	-0.8767	-3.2005*	-0.2039	-0.7931	-0.2373	-0.9836	0.3691	1.4952	-0.1900	-0.6757
T-9	0.3077	0.9918	-0.0759	-0.2429	-0.1833	-0.7784	0.4205	1.2977	-0.1144	-0.3915
T-8	-0.3909	-1.9348**	0.2953	1.1258	-0.1754	-0.5693	-0.2817	-1.0888	-0.4974	-1.8257**
T-7	-0.0346	-0.1379	0.5026	1.7059	-0.0824	-0.2742	0.2906	0.8557	0.0488	0.1422
T-6	0.2364	0.9533	-0.2041	-0.6850	-0.2257	-0.9477	-0.1589	-0.5255	0.1546	0.6939
T-5	0.5606	2.1144*	0.0566	0.1980	0.3432	1.2266	-0.2519	-0.8752	0.2607	1.0248
T-4	-0.0725	-0.3269	-0.0656	-0.2423	-0.3127	-1.3036	-0.2076	-0.5464	0.1935	0.8842
T-3	0.2557	0.8664	-0.0047	-0.0149	0.0192	0.0768	0.7422	2.6464*	-0.3369	-1.3327
T-2	0.1910	0.6002	0.1739	0.5601	-0.0752	-0.2300	-0.0152	-0.0478	0.0323	0.1134
T-1	0.1089	0.4932	-0.5367	-2.1311	-0.4993	-1.3466	-0.1944	-0.8275	0.2733	0.9828
T0	-0.1770	-0.5944	0.6811	2.1779*	0.7190	2.3041*	0.3349	1.2756	0.6489	1.8604**
T+1	0.0148	0.0688	0.4480	1.5103	0.1399	0.4723	0.2796	1.1973	0.5839	1.8802**
T+2	0.3078	0.8192	-0.4153	-1.2989	-0.6952	-2.4610*	-0.2390	-1.2506	-0.1973	-0.6673
T+3	0.7253	2.3807*	0.2281	0.7331	0.1930	0.7463	0.1689	0.6891	-0.1258	-0.4673
T+4	0.2578	0.9566	0.4341	1.6031	-0.1899	-0.4591	0.0681	0.2482	0.0966	0.3284
T+5	0.7669	2.8314*	0.0748	0.3297	0.1082	0.3922	-0.2341	-0.9283	-0.0862	-0.3750
T+6	0.4877	1.1719	-0.0287	-0.1258	0.6409	2.2447*	0.7864	2.6155**	-0.2143	-0.5994

(cont.)

Table 4.8 (cont.)

Day	XS (N = 131) AAR (%)	Z-stat (2-tailed)	S (N = 130) AAR (%)	Z-stat (2-tailed)	M (N = 131) AAR (%)	Z-stat (2-tailed)	L (N = 126) AAR (%)	Z-stat (2-tailed)	XL (N = 131) AAR (%)	Z-stat (2-tailed)
T+7	0.4555	1.6065	-0.0104	-0.0353	-0.0418	-0.1698	0.2378	0.6807	0.0073	0.0226
T+8	-0.7459	-2.5004*	-0.4314	-1.6878	-0.4837	-1.7747**	-0.0384	-0.1225	0.0891	0.3076
T+9	-0.4937	-1.4886	0.2802	0.8931	0.2039	0.7580	0.5008	1.5722	-0.2032	-0.7837
T+10	0.9313	2.2892*	-0.0041	-0.0155	0.1132	0.4397	0.0119	0.0441	-0.0352	-0.1461
T+11	0.2574	0.6727	0.0791	0.2945	0.4607	1.4522	-0.0531	-0.1150	0.2235	0.8378
T+12	-0.2032	-0.7662	-0.5843	-1.9518	-0.7032	-2.9206*	-0.0300	-0.0828	-0.4877	-1.5074
T+13	-0.5943	-1.8568**	-0.5233	-1.6509	-0.1694	-0.6322	-0.3964	-0.9920	-0.2537	-1.0148
T+14	-0.1498	-0.5048	-0.0634	-0.2346	-0.7474	-3.2917*	-0.2836	-0.7135	-0.3005	-1.0865
T+15	-0.1961	-0.5247	0.1737	0.4847	-0.0390	-0.1373	0.1066	0.3092	-0.0596	-0.2438
T+16	-0.4678	-1.9233**	-0.5057	-2.4459	-0.1676	-0.5024	0.2138	0.6835	-0.1998	-0.6211
T+17	-0.3452	-1.4632	0.3396	1.2132	-0.1173	-0.4956	0.0206	0.0670	-0.2838	-1.0825
T+18	0.2441	0.7028	0.3465	1.3490	-0.0360	-0.1205	-0.5147	-1.9632**	-0.0543	-0.1603
T+19	-0.0790	-0.3111	-0.0249	-0.0894	0.0766	0.3182	-0.2933	-0.9882	0.1627	0.5219
T+20	-0.6695	-2.2841*	-0.2155	-0.6854	-0.0143	-0.0485	-0.2668	-1.0973	-0.6501	-2.6777*
T+21	0.0496	0.1524	-0.1570	-0.5693	-0.1548	-0.4779	0.3219	1.1649	-0.2328	-0.9556
T+22	0.6079	1.8246**	-0.0632	-0.1750	0.2795	0.9393	0.0465	0.1778	0.3220	1.1690
T+23	0.0257	0.1644	-0.2757	-0.9007	0.1531	0.7553	-0.3704	-1.6403	-0.0866	-0.3678
T+24	-0.9084	-2.8432*	-0.7808	-3.1743	0.0506	0.1765	-0.1626	-0.6750	-0.1482	-0.5110
T+25	0.5521	2.3105*	-0.1947	-0.7245	-0.0696	-0.2072	0.0343	0.1391	0.1313	0.4365

Note * significant at the 0.05 level
   ** significant at the 0.10 level
   N.A. 27contract announcements

CAPM results in Table 4.8 indicate significant positive abnormal returns on the day following the announcement day (T_{+1}) for the XL contract size. Moreover, MM results in Table 4.7 show no significant positive abnormal return before the announcement day (T_{-25} to T_{-1}) for the M and XL contract sizes.

In general, announcement of business contract with S, M and XL budget sizes, once announced into the market, are capitalized rapidly into the firm's stock price within the announcement day.

4.2.2.2 CAAR: Five Different Contract Sizes

Table 4.9 exhibits the mean cumulative abnormal return (CAAR) of five different types of

contract sizes (XS, S, M, L, XL) for various time intervals and associated test statistics of

both the Market Model (MM) and the Capital Asset Pricing Model (CAPM) measures.

Table 4.9: Cumulative average abnormal returns; size effect

This table report the means of Cumulative Average Abnormal Returns (CAAR) and statistics surrounding the announcement Day as measured by MM and CAPM . We rank the contract according to the budget of the project and divided all contracts into 5 groups based on size. The smallest size is XS, Small size (S), Medium (M), Large size (L) and Largest size (XL).

Interval	The Market Model (MM)				The Capital Asset Pricing Model (CAPM)			
	CAAR (%)	Std. Deviation	Z-stat	p-value (2-tailed)	CAAR (%)	Std. Deviation	Z-stat	p-value (2-tailed)
XS					XS			
CAAR ±3	1.9937	9.4151	2.4236	0.0167**	1.4264	9.5004	1.7185	0.0881***
CAAR ±10	4.4466	15.4723	3.2893	0.0013*	2.8162	16.3046	1.9769	0.0502***
CAAR ±25	4.3329	19.6797	2.5199	0.0129**	0.5832	25.8373	0.2583	0.7966
S					S			
CAAR ±3	0.8350	8.5021	1.1198	0.2649	0.5745	8.5039	0.7703	0.4425
CAAR ±10	2.0426	17.3015	1.3461	0.1806	1.1938	17.5996	0.7734	0.4407
CAAR ±25	1.7314	25.8563	0.7635	0.4466	-0.6235	29.9028	-0.2377	0.8125
M					M			
CAAR ±3	0.4181	9.6769	0.4945	0.6218	-0.1987	9.9273	-0.2291	0.8192
CAAR ±10	1.1378	16.3862	0.7947	0.4282	-0.7213	17.5258	-0.4710	0.6384
CAAR ±25	1.0049	24.1602	0.4761	0.6348	-3.4691	27.2009	-1.4597	0.1468
L					L			
CAAR ±3	0.9427	6.0373	1.7521	0.0822***	1.0768	6.1323	1.9711	0.0509***
CAAR ±10	2.1416	15.3070	1.5705	0.1188	2.5895	16.7879	1.7314	0.0858***
CAAR ±25	-0.4322	21.3270	-0.2275	0.8204	0.5799	25.1131	0.2592	0.7959
XL					XL			
CAAR ±3	1.0927	10.1047	1.2377	0.2181	0.8783	9.5141	1.0566	0.2926
CAAR ±10	1.0779	14.6722	0.8409	0.4020	0.3884	15.2624	0.2913	0.7713
CAAR ±25	-1.1864	25.5976	-0.5305	0.5967	-2.9980	30.9113	-1.1101	0.2690

Note   *   significant at the 0.01 level
      **   significant at the 0.05 level
      ***   significant at the 0.10 level

As measured by the Market Model (MM), the mean CAAR of XS contract size of all

intervals; ± 3, ± 10 and ± 25 days surrounding the announcement day are significantly

positive CAAR at 1.9937, 4.4466 and 4.3329 percent with Z value of 2.4236, 3.2893 and

2.5199, respectively. While the CAPM results report significant positive CAAR for ± 3 and ± 10 day surrounding the announcement day, the mean CAAR of ± 3 days is 1.4264 percent with a Z value of 1.7185 and the mean CAAR of ± 10 days is 2.8162 percent with a Z value of 1.9769.

The mean CAAR results of the L contract size as measured by the MM show significantly positive means in one intervals; ± 3 days surrounding the announcement day. The means CAAR is 0.9427 percent and are statistically significant at the 0.10 level. The CAPM results show significant positive CAAR for ± 3 and ± 10 day surrounding the event day. The mean CAAR of ± 3 days is 1.0768 percent with a Z value of 1.9711, while the mean CAAR of ± 10 days is 2.5895 percent with a Z value of 1.7314. However, both measures report no evidence of statistical significance on the mean CAAR results of the S, M and XL contract sizes.

The results from the event study on the subsample of the XS and L contract sizes confirm the rejection of the Hypothesis 1(H_{01}): The expected value of the cumulative average abnormal return is equal to zero. This means that there are cumulative abnormal returns surrounding the announcements of business contracts when firms sign business contract of the XS and L budget sizes.

It should be noted that when firms sign contract as the XS size budget, there is no evidence of abnormal return on the announcement day. However, the mean CAAR of XS contract size is found for a positive accumulate abnormal return surrounding the event period.

4.2.2.3 Difference Abnormal Return among Five Different Contract Sizes

It is essential to verify whether the abnormal returns to firms engaging in five different size contracts are different. Third null hypothesis (H_{03b}) forms the basis for the test of difference on abnormal return from the announcement of five contract sizes. The difference can be verified by comparing the mean value of daily AAR. Comparison of the mean value of daily AAR parameters is conducted using the paired mean difference statistic between each pair of contract sizes. Results of the procedures are reported in Table 4.10.

Table 4.10 shows no evidence of any the significant difference of the ARR from both MM and CAPM measures. The results accept the H_{03b}. Hence, the returns to firms engaging in five different size contracts are not different.

Table 4.10: Differences in the Average Abnormal returns: size effect

The table reports the difference in the means of cumulative abnormal returns on the business contract announcement among various business size. MM is the market model abnormal returns. The smallest size is XS, Small size (S), Medium (M), Large size (L) and Largest size (XL).

Panel a: market model (MM) on abnormal returns

Types of Contract Size Measured by MM	Mean paired differences	Std. error mean	*t-test*	*p-value*
XS vs. S	0.0510	0.0737	0.6923	0.4919
XS vs. M	0.0652	0.0764	0.8536	0.3974
XS vs. L	0.0934	0.0792	1.1795	0.2438
XS vs. XL	0.1082	0.0759	1.4254	0.1603
S vs. M	0.0142	0.0489	0.2916	0.7718
S vs. L	0.0424	0.0541	0.7844	0.4365
S vs. XL	0.0572	0.0600	0.9538	0.3448
M vs. L	0.0282	0.0487	0.5791	0.5651
M vs. XL	0.0430	0.0512	0.8386	0.4057
L vs. XL	0.0148	0.0624	0.2369	0.8137

Panel b: market and risk adjusted model (CAPM) on abnormal returns

Types of Contract Size Measured by CAPM	Mean paired differences	Std. error mean	*t-test*	*p-value*
XS vs. S	0.0237	0.0735	0.3218	0.7489
XS vs. M	0.0795	0.0760	1.0459	0.3006
XS vs. L	0.0001	0.0789	0.0008	0.9994
XS vs. XL	0.0702	0.0755	0.9304	0.3566
S vs. M	0.0558	0.0489	1.1420	0.2589
S vs. L	-0.0236	0.0538	-0.4388	0.6627
S vs. XL	0.0466	0.0594	0.7833	0.4372
M vs. L	-0.0794	0.0486	-1.6329	0.1088
M vs. XL	-0.0092	0.0512	-0.1803	0.8576
L vs. XL	0.0702	0.0622	1.1282	0.2646

4.3 Summary

The results from the event study evidence that stock prices increase on and after the announcement of business contract winner news. This research also observes that the announcement has an effect on stock prices and its effect varies when different types of contracts are incorporate. First, results report that both government and corporate contracts affect stock returns on the days around announcement period (t±3). However, the corporate project announcement effects last longer. This study asserts that the market fully absorbs government contracts winning announcement better than corporate contracts announcement. Second, this study finds that the smallest size (XS) and large size (L) business contract announcements show cumulative abnormal returns following the event dates.

This research not only contributes to evidence on semi-strong form efficiency, but also contributes to evidence of the information of business contract announcement. This research also adds supporting evidence to the signalling hypothesis. The announcement of winning business contracts may be a signalling instrument that draws interest from investors.