

Trade Liberalization and the Economy:

Stock Market Evidence from Singapore

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January 11, 2009

Abstract

We examine the effect of the United States–Singapore Free Trade Agreement (FTA) on the value of firms listed in the Singapore Exchange using event study analysis. Despite the predictability of the FTA negotiation, we find that one event—the removal of the last obstacle to the free trade deal in January 2003—increases the value of firms in some industries by 2-5%. These results may indicate that trade liberalization and FTAs do increase the value of firms .

Keywords: free trade agreements, event study analysis, Singapore

JEL classification: F13

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1 Introduction

This paper examines the effect of free trade agreements (FTAs) on the value of firms using event study analysis. The central questions are the followings: Do FTAs increase the value of firms as perceived by investors? Which industries win or lose? Can we say firms profit from FTAs, and, hence, economies gain from trade liberalization?

We consider the United States–Singapore Free Trade Agreement (USSFTA). An event study analysis of Singapore and this FTA is interesting for several reasons. First, Singapore has been adopting liberal trade policies, which means the gain from complete trade liberalization through FTAs may not be large. Second, the USSFTA requires Singapore to set zero tariffs for all U.S. exports immediately. The U.S., on the other hand, is required to eliminate 92% of current tariffs on Singapore exports, while the rest within eight years. Singapore firms would have to compete with cheaper imports immediately, while some of their competitors in the U.S. will enjoy protection for a few more years. Third, Singapore is perhaps the most aggressive country that has been pursuing FTAs, which makes the negotiation moves of the Government of Singapore more predictable.¹

These features would perhaps make the identification of the effect of FTA in event study analysis more difficult. If we could show that FTAs increase the value of firms in a free market economy whose government eagerly and predictably pursues FTAs, we would perhaps provide some evidence that FTAs do increase the value of firms.

We estimate the effect of FTA-related news using a modified market model, from which we could use the residuals as the measures of the abnormal returns (*ARs*) or

¹To date, Singapore has concluded 13 FTAs and is currently negotiating nine others. See <http://www.fta.gov.sg/>.

cumulative abnormal returns (*CARs*) associated with the FTA. First, we consider one industry at a time, and we constrain all firms in the industry to have the same responses to the FTA news. Second, we relax this assumption by parameterizing the *ARs* or *CARs* with measures of comparative advantage and economies of scale.²

We find that many of the event coefficients that we introduce in the model are insignificant statistically. Only one event that investors seem to think surprising, i.e., the removal of the last obstacles to the USSFTA deal in January 2003. On average, the value of firms in two or three out of six industries that we consider increases 2-5% because of this event. Other industries may profit from the FTA too; their event coefficients are not statistically significant, however.

We do some robustness checks. First, we use Straits Times Index as the market portfolio rather than the FTSE Strait Times All Share Index to exclude equities that are infrequently traded from the market index. Second, we examine firms in several sectors rather than industries to make firms in each sample more similar. Third, we include sector stock index to allow each firm to have different sector specific risks. Fourth, we drop all events except the one that is significant statistically in the basic specification. Overall, our results are quite robust.

To the best of our knowledge, there are three papers that analyze the effect of FTA on the value of firms using event study analysis, i.e., Thompson (1993, 1994) and Rodriguez (2003). The focus of Thompson (1994) and Rodriguez (2003), however, is on whether the market responses to news about, respectively, Canada–United States Free Trade Agreement and North American Free Trade Agreement, are consistent with comparative advantage and economies of scale as predicted by the Heckscher–Ohlin model and the New Trade Theory. While we control for

²Controlling for these two characteristics in the market model is proposed by Thompson (1994), in which she develops a theoretical model of the value of a firm’s capital as a function of, among others, the relative factor shares, the relative factor prices, and the relative plant scales.

Singapore's comparative advantage and the firms' plant size in some specifications, we focus more on whether the FTA increases the value of firms.³

This paper is more closely related to Thompson (1993). She considers six Canada–United States Free Trade Agreement related events, and she finds that only one event in which the ARs are both statistically significant and consistent with the hypothesis about the effect of FTA.

The paper proceeds as follows. Section 2 presents the methodology. Section 3 describes the events and data. Sections 4 and 5 discuss the empirical results. Section 6 concludes.

2 Methodology

We examine investors' expectation about the effect of USSFTA on the value of Singapore firms using event study analysis. Under the assumption that market is efficient, equities will be priced so that they yield "normal"-risk adjusted expected rate of return. When investors find out that the Government of Singapore concludes an FTA with the U.S., and if this agreement increases the expected stream of future profits and, hence, the value of Singapore firms, they will bid up the share prices immediately. We could then use the response of share prices to the FTA to estimate the change in the value of firms that results from the FTA announcement.

We model the expected return of securities using the following market model:

$$r_{it} = \alpha_i + \beta_i r_{mt} + \epsilon_{it}, \quad t = 1, \dots, T, \quad (1)$$

where r_{it} is the return to security i at time t ; r_{mt} is the return to the market portfolio at time t ; β_i is the systematic risk of security i , and ϵ_{it} is a stochastic term, which is assumed to be homoskedastic across equities and serially uncorrelated. We use

³Thompson (1994) and Rodriguez (2003) do not present the event coefficients in their papers.

the residuals of the market model as a measure of the abnormal returns (ARs) of a security.⁴

Our primary interest is the sum of the abnormal returns of security i over an event window s (the cumulative abnormal returns (CAR)), which is the measure of the effect of event s on the market value of security i . If we find that CAR_{is} is positive and statistically significant, we would then reject the null hypothesis that event s does not change investors' expectation about firm i 's stream of future profits.

Because we have multiple events, to simplify the estimation of the ARs , we introduce several event-day indicator variables to Equation (1) as follows

$$r_{it} = \alpha_i + \beta_i r_{mt} + \sum_s \gamma_{its} D_{its} + \epsilon_{it}, \quad t = 1, \dots, T, \quad (2)$$

where D_{its} is an indicator variable equals one for the t th day in event window s and zero otherwise. The estimated coefficient of γ_{its} would then be identical to the ARs of security i at time t associated with the event s estimated using Equation (1).

We make two adjustments to Equation (2). First, we allow the systematic risk of securities after Event 1 to be different from the risk during the estimation window. Second, we control for leveraging across firms.⁵ The magnitude of the change in share prices that results from an FTA announcement depends on the debt-to-equity ratio of firms. Because we will assume that firms have similar responses to an announcement, we divide the event indicator variables by the share of equity in the total firm value. Our working model would therefore be as follows:

$$r_{it} = \alpha_i + \beta_i r_{mt} + \alpha'_i + \beta'_i r'_{mt} + \sum \frac{1}{(1 - Debt)} \gamma_{its} D_{its} + \epsilon_{it} \quad (3)$$

⁴For surveys on event study analysis, see MacKinley (1997) and Binder (1998). For its application in the economics of regulation, see Binder (1985) and Lamdin (2001).

⁵This adjustment to the market model is used by Rose (1985).

where α'_i and β'_i are the α 's and β 's of the return to the market portfolio after Event 1, and $(1 - Debt_i)$ is the share of equity in firm i . We estimate this system of equations using Zellner (1962)'s Seemingly Unrelated Regression.⁶

An unconstrained estimation of this model has low power against the null hypothesis. Therefore, we impose some structures on this system of equations. First, we group firms according to their industries or sectors, and constrain that all firms within a group have the same response to an event. If the firms in a group are quite similar so that the events affect the firms similarly, the constraint is justifiable.

Second, we relax the equality constraint by parameterizing γ_{its} , the share price responses, as functions of firms' or industries' characteristics. Following Thompson (1994)'s theoretical model of the value of a firm's capital, we use two characteristics to parameterize γ_{its} , i.e., loan to capital ratio as a measure of comparative advantage, and plant scales as a measure of economies of scale. The γ_{its} in Equation (3) is then modelled as follows:

$$\gamma_{its} = \theta_{1s} + \theta_{2s}LCR_i + \theta_{3s}SCALE, \quad (4)$$

where LCR is the relative labor intensity and $SCALE$ is the relative plant scale.

3 Events and Data

3.1 Events

The Governments of Singapore and U.S. initiated the negotiation on November 16, 2000, and the FTA was signed three years later on May 6, 2003. The long negotiation of the FTA, and the both governments' strong support for it, make it difficult to identify events that investors find unexpected. Nevertheless, based on news reported in the Straits Times, Business Times, and Channel News Asia, we

⁶In cases in which we use three-day- or five-day event windows, we use a modified version of Equation (3) proposed by Salinger (1992) to account for both the intertemporal and contemporaneous correlation of estimated residuals.

consider ten events that may change investors' perception on the probability that the FTA will be concluded and implemented. Table 1 presents these events.

[INSERT TABLE 1 HERE]

The first event is the joint statement on a U.S.–Singapore Free Trade Agreement. Since then, both parties had held several rounds of negotiation, each lasted a few week long. Both parties were typically optimistic about the negotiation before each round, and significant progress was typically reported at the conclusion. We do not think that these rounds of negotiation and their results are surprising, however.

The second event is the rejection of the Trade Promotion Authority (TPA) bill, which would facilitate the passage of FTAs in Congress, by the U.S. Senate. Most observers did not think that this rejection would harm the FTA so that this event may not be surprising either. We still include it as one of the events, however. We also include the clearance of the TPA bill by the U.S. House of Representatives a few months later as the third event, and the announcement of broad agreement over the FTA in November 2002 as the fourth event.

The fifth event is a major milestone in the negotiation of the FTA. On January 15, 2003, it was announced that Singapore and U.S. overcame the last obstacle to an FTA deal, i.e., the free transfer of capital. Later that month, Bush administration notified Congress of plan to sign FTA with Singapore, which we include as the sixth event.

The last four events are as follows: The FTA text was made online, the news that Goh Chok Tong to meet Bush to sign the FTA, the signing of the FTA itself, and the approval of the FTA by the U.S. House of Representatives. We are not sure whether investors find these events surprising. However, we include them all and let the data tell us which events are unexpected, if there are any.

3.2 Data

We get the daily stock market data from the Bloomberg. The period of analysis starts one year before the first event, and ends right after the last event, i.e., from September 1, 1999 to July 26, 2003. We include firms whose stocks were listed in the Singapore Exchange during the entire period of analysis. In addition, these firms must be located in Singapore.

We use the dividend-adjusted stock prices and the FTSE Strait Times All Share Index to calculate the stock return, r_t , and the return to the market portfolio, r_{mt} , respectively. Because the share of the market value of debt in total firm value, $Debt$, is not available, we use the book value of debt as a proportion of total assets as a proxy.

The relative labor intensity, LCR , which is defined as the ratio of labor income to capital income, is not available. As a proxy, we use the ratio between the number of employees and the value of the firms' capital in 2000. We calculate the relative plant scale, $SCALE$, as the difference between the average sales of firms in a sector in Singapore and those in the U.S.

We include six out of the ten industries as defined by Bloomberg. They are Basic Materials-, Consumer Goods-, Financial, Technology, Industrial- and Health Care industries. Because firms included in the "Industrial" are large and diverse, we exclude some sectors such as Industrial Engineering and Industrial Services.⁷

Out of the 753 firms listed in the Singapore Exchange, 456 equities satisfy our requirements. Many securities are infrequently traded however. The total number of firms that we use in all regression is 144 if we include all ten events. In some specifications we include only one event (i.e., Event 5); in this case the total number

⁷Bloomberg does not provide the SIC codes of firms listed in the Singapore Exchange. Industries that we exclude are Consumer Services, Oil & Gas, Telecommunications, and Utilities.

of firms in the samples is 210.

4 Results

4.1 Constrained Results

We estimate the constrained version of Equation (3) for six industries using five-day-, three-day-, and one-day event windows. We find that, in all cases, almost all estimates of the event coefficients are insignificant statistically. To reduce the noise that may arise in longer event-window periods, at the risk of putting some events outside of event windows, we decide to use one-day event window. Table 2 presents the constrained results.

[INSERT TABLE 2 HERE]

The estimates are typically small and statistically insignificant. We find only one event coefficient that is significant statistically at 5% level, i.e., the estimate of Event 5 for Health Care industry, which includes Health Care Equipment & Services and Pharmaceuticals & Biotechnology sectors. Investors think that Event 5—the removal of the last obstacle to an FTA deal—increases the expected future profits of firms in this industry by 2%.

The only other estimate that is statistically significant at 10% level or lower is the estimate of Event 5 for Basic Materials industry. The estimate is much smaller, however: Overcoming the last hurdle increases firms values in this industry by 0.3%.

4.2 Cross-Firm Heterogeneity

Perhaps the characteristics of companies in each of the six industries are quite different so that the FTA does not affect the expected future profits of firms similarly. If this is the case, estimating the average responses of firms using the constrained version of Equation (3) will lead to ambiguous results. Therefore, to allow each

firm to respond differently to the FTA-related announcements, we estimate Equation (3) in which the γ_{its} is parameterized with two firms' characteristics, i.e., *LCR* and *SCALE*. Table 3 presents the results.⁸

[INSERT TABLE 3 HERE]

Like the constrained results, almost all event coefficients are insignificant statistically. Only the estimates of Event 5 that are significant statistically at 5% level, i.e., the estimates for Basic Materials and Health Care industries.⁹ According to these estimates, the removal of the last obstacle to an FTA deal increases the values of Basic Materials companies by 11.4% and those of Health Care companies by 4.2%. The only other estimates that are statistically significant at 10% level are the estimate of Event 5 for Technology Hardware & Equipment industry and that of Event 8—Prime Minister Goh Chok Tong to meet Bush—for Consumer Goods industry.

4.3 Further Analyses

We do some robustness checks. First, the FTSE Strait Times All Share Index, which we use as the market portfolio, may include securities that are infrequently traded. To make sure that the market model provides unbiased systematic risks of securities and *ARs*, we use the Straits Times Index, an index based on the stocks of 30 representative companies, as the market portfolio. These two indices are highly correlated, however; and we get estimates that are quite similar to the basic results.¹⁰

⁸The estimates of *LCR* and *SCALE* are not provided to save space. They are available from authors upon request.

⁹Basic Materials industry includes Chemicals-, Forestry & Paper-, Industrial Metals-, and Mining sectors.

¹⁰To save space, we do not present all results of robustness checks. They are available upon request from the authors, however.

Second, the companies in each of the six industries that we consider in our basic specifications may be too diverse, and this may make the constraint that all firms have the same response to an event less justifiable. To rule out this possibility, we estimate Equation (3) for twelve sectors, two from each industry. Table 4 presents the results.

[INSERT TABLE 4 HERE]

Almost all estimates for all ten events are insignificant statistically. Only two estimates are significant statistically at 5% level of significance or less, i.e., the Event 5 estimates for Chemicals- and Technology Hardware & Equipment sectors. Both estimates are positive, which indicate that overcoming the last hurdle to an FTA deal increases the expected future profits of firms in the Chemicals- and Technology Hardware & Equipment sectors by 0.6% and 2.6%, respectively. Two estimates of Event 5 are negative; only one of them is significant statistically at 10% level, however, i.e., the estimate for Banking sector. The market anticipates 1.4% lower profits of banks as a result of the agreement on the free transfer of capital.

Overall, these estimates are in line with the basic results: The statistically significant results for Basic Materials- and Health Care industries seems to be driven by companies in some of their sectors, in particular Chemicals- and Technology Hardware & Equipment sectors, respectively.

Third, we do not account for the sector specific risks in our basic specification. To allow each firm in a sector to have different sector specific risks, we introduce a sector stock index into Equation (3) as follows.

$$r_{it} = \alpha_i + \beta_i r_{mt} + \zeta_i r_{int} + \dots + \epsilon_{it}, \quad t = 1, \dots, T, \quad (5)$$

where r_{int} is the sector n stock index of firm i at time t . This modification does not change our basic results much, however.

Fourth, perhaps we include too many events that investors find unsurprising, and, hence, do not affect the price of securities. Even though this inclusion does not cost us unbiasedness, it may make our estimates less precise. To investigate this possibility, we drop all events except Event 5, which is the only event whose coefficients are significant statistically at 5% level. Table 5 presents the results for the constrained model and cross-firm heterogeneity in Panel 1 and 2, respectively, using one-day- and three-day event windows.

[INSERT TABLE 5 HERE]

Overall, the basic results are quite robust. They are sensitive to the choice of event windows, however. Estimation of constrained model using three-day event window provides estimate of the *CAR* of Basic Materials industry that is statistically insignificant, though still positive. Allowing cross-firm heterogeneity using three-day event window makes the estimate of the *CAR* of Basic Material industry significant statistically at 10% level only.

We find that most of the coefficient of *LCR* and *SCALE* are insignificant statistically. These results may suggest that Singapore and U.S. economies are not that different, or, perhaps more likely, we do not have sufficient variation in the data to reject the null hypothesis that labor to capital ratio and plant scales are important determinants of the effect of FTA. If they are significant statistically, *LCR* is negative while *SCALE* is positive, which mean the more labor intensive Singapore firms are, the smaller the effect of FTA is; the larger Singapore firms compared to their competitors in the U.S. are, the larger the effect of FTA is.

5 Discussion

We do not expect that the market would strongly respond to all ten FTA-related announcements. Some of the events, such as the joint statement, the meeting of Goh Chok Tong and Bush, and the approval of U.S. House of Representatives, might be expected long before they were in the news. We introduce them into the model to let the data decide which announcements that investors find surprising and which ones that are not. Besides, Thompson (1993, 1994) and Rodriguez (2003), three papers that are related to this paper, also find many statistically insignificant event coefficients.¹¹

Nevertheless, we can think of several reasons why most events do not seem to affect the value of firms. First, the negotiation of the FTA is perhaps too predictable so that, unlike, for example, that of NAFTA, investors do not find the events surprising.

Second, some stocks in the Singapore Exchange are infrequently traded, and this makes the estimation of the Seemingly Unrelated Regression suffers from collinearity problem. Many equities are then dropped from the sample—out of the 456 equities that are available for trade during the entire period of analysis, only 144 of them that are included in all regression. This collinearity problem, and the exclusion of many firms from the regressions, may have compromised our results.

Third, maybe we group too diverse companies together so that the equality constraint across firms is not justifiable. We could have examined the effect of the FTA for some subsectors of Singapore economy rather than industries or sectors, but, given the collinearity problem mentioned above, the number of firms in each subsector would fall dramatically. Even when we do sector by sector analysis such

¹¹Thompson (1994) and Rodriguez (2003)'s model, which is slightly different from, and less flexible than Equation (4), is as follows: $\gamma_{its} = \theta_{1s} + \lambda_s(\theta_2 LCR_i + \theta_3 SCALE)$.

as that in Table 4, only a few firms remain in the sample.

Fourth, unlike Singapore that is required to set zero tariffs for all U.S. exports immediately, the U.S. is required to eliminate 92% of current tariffs on Singapore exports while the rest within eight years. This may make the event coefficients smaller, and make it more difficult to reject the null hypothesis.

Nevertheless, we still find that two or three out of six industries profit from the FTA.¹² Two other industries may benefit too; their event coefficients are not statistically significant, however. Only one industry that is likely to lose, if at all; that is the Financial industries.

6 Concluding Remarks

The negotiation of the USSFTA is perhaps too predictable. Nevertheless, we find that the market respond positively to the USSFTA, in particular to the removal of the last obstacle to an FTA deal in January 2003. According the market evidence, on average, firms in the Basic Materials- and Health Care industries are the clear winners: Their values increase by 2-5%. Our results are silent on firms in the Consumer Goods, Industrials, Financial and Technology industries, however. Some firms in the latter industries may gain while some other loose so that the effects cancel out and we cannot reject the null hypothesis.

Presumably, the average effect of the FTA on the values of firms in the Basic Materials- and Health Care industries is larger. Event 5 may be partially expected, which makes the estimate of the effect smaller. Perhaps we can say that the conclu-

¹²These results also seem to be in line with some of the sectors that the Government of Singapore considers to profit from the USSFTA. The sectors that are part of the two industries in our sample are electronics, chemicals, instrumentation equipment, and mineral products. We do not include petrochemicals in our sample; and we do not have sufficient evidence to conclude that processed foods sector, which is part of Consumer Goods industry in our sample, would benefit from the USSFTA. See Info Kit: Information Paper on the US-Singapore Free Trade Agreement (USSFTA), 16 May 2003, which is available at http://www.fta.gov.sg/ussfta/info_kit_ussfta.pdf.

sion of the USSFTA was partially expected long before the joint statement made by Goh Chok Tong and Bill Clinton. Moreover, we have not mentioned the effect of the FTA on consumers, which are likely to be the big winners of the FTA.

The predictability of the FTA negotiation may contribute to the statistical insignificance of our results. It would be interesting to examine other Singapore FTAs that are more controversial than the USSFTA. Looking into Singapore FTAs with developing countries rather than developed countries like the U.S. would be interesting too. The gain from these FTAs may be larger so that the identification of the effect of FTA on the value of firms would be easier. These will be the subject of future research.

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Events	Dates	Descriptions
1	16/11/2000	President Clinton and Prime Minister Goh Chok Tong made a joint statement on a United States-Singapore Free Trade Agreement.
2	17/05/2002	The U.S. Senate denied the Trade Promotion Authority (TPA) bill, which would facilitate the passage of FTAs in Congress.
3	30/07/2002	The U.S. House of Representative cleared the TPA Bill; Senate was likely to pass the bill later this week.
4	19/11/2002	Singapore and U.S. reached broad agreement over the FTA.
5	15/01/2003	Singapore and U.S. overcome the last obstacle to an FTA deal, i.e., the free transfer of capital.
6	31/01/2003	Bush administration notified Congress of plan to sign FTA with Singapore.
7	08/03/2003	U.S.-Singapore FTA text was made available online.
8	03/04/2003	Prime Minister Goh Chok Tong to meet Bush on May 6.
9	06/05/2003	President Bush and Prime Minister Goh Chok Tong signed U.S.-Singapore Free Trade Agreement.
10	26/07/2003	The US-Singapore Free Trade Agreement was approved in the U.S. House of Representatives.

Table 1: Event Descriptions

Dependent Variable: r_t						
	Basic Materials	Consumer Goods	Financials	Technology	Health Care	Industrial
	(1)	(2)	(3)	(4)	(5)	(6)
1 Made joint statement	0.000 (0.002)	0.001 (0.004)	0.001 (0.005)	0.004 (0.010)	-0.010 (0.009)	-0.003 (0.004)
2 TPA was denied	0.001 (0.002)	0.007 (0.004)	-0.001 (0.005)	0.009 (0.010)	0.003 (0.009)	0.001 (0.004)
3 TPA was approved	0.000 (0.002)	-0.003 (0.004)	0.000 (0.005)	0.004 (0.010)	-0.009 (0.009)	0.002 (0.004)
4 Broad agreement	-0.001 (0.002)	-0.002 (0.004)	0.002 (0.005)	0.001 (0.010)	-0.003 (0.009)	0.002 (0.004)
5 Overcame last hurdle	0.003 (0.002)+	0.004 (0.004)	-0.004 (0.005)	0.011 (0.010)	0.020 (0.009)*	0.004 (0.004)
6 Congress was notified	0.000 (0.002)	0.001 (0.004)	0.000 (0.005)	-0.004 (0.010)	0.005 (0.009)	0.002 (0.004)
7 FTA text was made online	0.000 (0.002)	-0.001 (0.004)	0.001 (0.005)	-0.003 (0.010)	-0.010 (0.009)	0.000 (0.004)
8 Goh and Bush to meet	0.000 (0.002)	0.000 (0.004)	-0.003 (0.005)	0.003 (0.010)	-0.002 (0.009)	0.002 (0.004)
9 FTA was signed	0.000 (0.002)	0.000 (0.004)	0.000 (0.005)	0.007 (0.010)	-0.006 (0.009)	0.002 (0.004)
10 Approved by House	0.000 (0.002)	0.001 (0.004)	-0.006 (0.005)	-0.004 (0.010)	0.003 (0.009)	0.002 (0.004)
Number of daily returns	7848	30411	19620	3924	15696	66708
Number of firms	8	31	20	4	16	68

Note: Standard errors are in parentheses. + significant at 10%; * significant at 5%; ** significant at 1%

Table 2: Constrained Results

Dependent Variable: r_t		Basic Materials	Consumer Goods	Financials	Technology	Health Care	Industrial
		(1)	(2)	(3)	(4)	(5)	(6)
1	Made joint statement	0.026 (0.035)	0.005 (0.008)	0.004 (0.009)	-0.003 (0.013)	-0.007 (0.017)	-0.003 (0.005)
2	TPA was denied	0.025 (0.035)	0.001 (0.008)	-0.002 (0.009)	0.013 (0.013)	0.011 (0.017)	0.000 (0.005)
3	TPA was approved	-0.026 (0.035)	0.010 (0.008)	-0.003 (0.009)	0.017 (0.013)	-0.006 (0.017)	0.004 (0.005)
4	Broad agreement	-0.057 (0.035)	-0.006 (0.008)	-0.008 (0.009)	0.001 (0.013)	-0.006 (0.017)	0.002 (0.005)
5	Overcame last hurdle	0.114 (0.035)**	0.007 (0.008)	-0.011 (0.009)	0.022 (0.013)+	0.042 (0.017)*	0.004 (0.005)
6	Congress was notified	-0.018 (0.035)	-0.011 (0.008)	-0.005 (0.009)	0.010 (0.013)	0.020 (0.017)	0.001 (0.005)
7	FTA text was made online	-0.005 (0.035)	0.008 (0.008)	0.008 (0.009)	0.001 (0.013)	0.010 (0.017)	-0.002 (0.005)
8	Goh and Bush to meet	-0.008 (0.035)	-0.016 (0.008)+	0.000 (0.009)	0.013 (0.013)	0.023 (0.017)	0.006 (0.005)
9	FTA was signed	-0.013 (0.035)	-0.009 (0.008)	-0.002 (0.009)	0.017 (0.013)	-0.004 (0.017)	-0.002 (0.005)
10	Approved by House	0.021 (0.035)	0.000 (0.008)	-0.002 (0.009)	-0.008 (0.013)	0.011 (0.017)	0.000 (0.005)
Number of daily returns		6867	30411	17658	3924	15696	66708
Number of firms		7	31	18	4	16	68

Note: Standard errors are in parentheses. + significant at 10%; * significant at 5%; ** significant at 1%

Table 3: Cross-Firm Heterogeneity

Dependent Variable: r_i		Chemicals	Industrial Metal	Food Products	Household Goods	Banks	General Financial	E&E Equipment	Industrial Transport.	Pharmaceuticals	Healthcare Products	Software	Hardware
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	
1	Made joint statement	0.000 (0.003)	-0.010 (0.029)	-0.001 (0.005)	0.003 (0.007)	0.001 (0.008)	0.001 (0.006)	-0.001 (0.006)	0.002 (0.009)	-0.004 (0.014)	0.010 (0.013)	-0.011 (0.014)	-0.010 (0.010)
2	TPA was denied	0.000 (0.003)	0.031 (0.029)	0.008 (0.005)	0.010 (0.007)	-0.005 (0.008)	0.000 (0.006)	-0.002 (0.006)	0.003 (0.009)	0.010 (0.014)	0.008 (0.013)	-0.001 (0.014)	0.007 (0.010)
3	TPA was approved	0.000 (0.003)	-0.002 (0.029)	-0.004 (0.005)	0.001 (0.007)	-0.003 (0.008)	0.003 (0.006)	-0.004 (0.006)	0.008 (0.009)	0.020 (0.014)	-0.008 (0.013)	0.001 (0.014)	-0.011 (0.010)
4	Broad agreement	-0.002 (0.003)	-0.001 (0.029)	0.000 (0.005)	-0.007 (0.007)	-0.005 (0.008)	0.004 (0.006)	-0.003 (0.006)	0.003 (0.009)	0.000 (0.014)	0.002 (0.013)	-0.001 (0.014)	-0.002 (0.010)
5	Overcame last hurdle	0.006 (0.003)*	-0.001 (0.029)	0.003 (0.005)	0.008 (0.007)	-0.014 (0.008)+	0.001 (0.006)	0.005 (0.006)	0.011 (0.009)	0.021 (0.014)	0.004 (0.013)	0.006 (0.014)	0.026 (0.010)*
6	Congress was notified	-0.001 (0.003)	0.026 (0.029)	0.003 (0.005)	0.000 (0.007)	-0.002 (0.008)	0.002 (0.006)	0.001 (0.006)	-0.002 (0.009)	0.005 (0.014)	-0.010 (0.013)	-0.003 (0.014)	0.013 (0.010)
7	FTA text was made online	0.000 (0.003)	-0.001 (0.029)	-0.003 (0.005)	0.006 (0.007)	0.009 (0.008)	-0.004 (0.006)	-0.010 (0.006)	-0.008 (0.009)	0.002 (0.014)	-0.008 (0.013)	-0.026 (0.014)+	-0.002 (0.010)
8	Goh and Bush to meet	0.000 (0.003)	-0.001 (0.029)	0.003 (0.005)	-0.009 (0.007)	0.001 (0.008)	-0.004 (0.006)	-0.012 (0.006)+	-0.004 (0.009)	0.014 (0.014)	-0.006 (0.013)	-0.014 (0.014)	0.004 (0.010)
9	FTA was signed	0.000 (0.003)	-0.001 (0.029)	0.004 (0.005)	-0.007 (0.007)	-0.005 (0.008)	0.003 (0.006)	-0.003 (0.006)	0.016 (0.009)+	0.021 (0.014)	-0.004 (0.013)	-0.009 (0.014)	-0.007 (0.010)
10	Approved by House	0.000 (0.003)	0.007 (0.029)	0.004 (0.005)	-0.001 (0.007)	-0.001 (0.008)	-0.008 (0.006)	0.005 (0.006)	0.005 (0.009)	-0.004 (0.014)	-0.004 (0.013)	-0.005 (0.014)	0.007 (0.010)
Number of daily returns		2943	1962	13734	5886	2943	12753	22563	6867	981	2943	1962	13734
Number of firms		3	2	14	6	3	13	23	7	1	3	2	14

Note: Standard errors are in parentheses. + significant at 10%; * significant at 5%; ** significant at 1%

Table 4: Constrained Results for Several Subsectors

Dependent Variable: r_t						
	Basic Materials	Consumer Goods	Financials	Technology	Health Care	Industrial
	(1)	(2)	(3)	(5)	(4)	(6)
<i>Panel A: Basic Specification</i>						
<i>1. One-day event window</i>						
Event 5 (AR)	0.005 (0.002)**	0.003 (0.003)	-0.004 (0.003)	0.010 (0.008)	0.021 (0.008)*	0.006 (0.002)*
<i>2. Three-day event window</i>						
Event 5 (CAR)	0.004 (0.003)	0.000 (0.005)	-0.013 (0.006)*	0.009 (0.014)	0.053 (0.014)**	0.004 (0.004)
<i>Panel B: Firm Heterogeneity</i>						
<i>1. One-day event window</i>						
Event 5 (AR)	0.051 (0.026)+	0.007 (0.005)	-0.010 (0.006)	0.017 (0.011)	0.023 (0.012)*	0.004 (0.003)
LCR	-0.0002 (0.001)	-0.0002 (0.000)	0.0025 (0.005)	0.0001 (0.001)	0.0010 (0.001)	0.0003 (0.000)
SCALE	0.0020 (0.001)+	0.0001 (0.000)	-0.0004 (0.000)	0.0007 (0.001)	0.0008 (0.001)	0.00001 (0.000)
<i>2. Three-day event window</i>						
Event 5 (CAR)	0.034 (0.046)	-0.003 (0.008)	-0.014 (0.011)	0.039 (0.019)*	0.068 (0.020)**	0.007 (0.005)
LCR	-0.0002 (0.002)	-0.0008 (0.000)	0.0049 (0.009)	-0.0025 (0.002)	-0.0035 (0.002)*	0.0000 (0.000)
SCALE	0.0013 (0.002)	-0.0004 (0.000)	0.0002 (0.001)	0.0018 (0.001)+	-0.0002 (0.001)	0.0005 (0.001)
Number of daily returns	3294	14274	6954	2928	12444	36966
Number of firms	9	39	19	8	34	101

Note: TAR stands for abnormal returns; CAR cumulative abnormal returns. Standard errors are in parentheses. + significant at 10%; * significant at 5%; ** significant at 1%

Table 5: Event 5 (Overcame the Last Hurdle) Only