

FEATURE ARTICLE

**DO FREE TRADE AGREEMENTS MATTER?
EVALUATING THE IMPACT OF FTAs ON SINGAPORE'S DOMESTIC
EXPORTS OF GOODS**

DO FREE TRADE AGREEMENTS MATTER?

Evaluating the impact of FTAs on Singapore's domestic exports of goods

EXECUTIVE SUMMARY

- This paper examines whether Singapore's FTAs have had an impact on Singapore's exports of goods.
- The results show that FTAs have helped to boost Singapore's exports, and hence have contributed to Singapore's economic growth.

The views expressed in this paper are solely those of the authors and do not necessarily reflect those of the Ministry of Trade and Industry or the Government of Singapore.

INTRODUCTION

Singapore is a small, open economy, highly dependent on external demand. In 2010, external demand accounted for nearly three-quarter of Singapore's total demand. Singapore's dependence on trade means that trade barriers erected by other countries result in significant welfare losses for Singapore.

Free Trade Agreements (FTAs) aim to reduce or eliminate trade barriers between the parties to the FTAs, and thus increase trade between them. An FTA also provides legal certainty or "insurance" in that it prevents a party to the FTA from unilaterally increasing trade barriers vis-à-vis its FTA partner. Furthermore, FTAs of a good quality help to keep up the momentum of free trade and act as building blocks to greater regional or international trade liberalisation. Given these advantages, FTAs have been a crucial component of Singapore's trade strategy over the past two decades. Singapore undertook its first multi-party FTA with ASEAN in 1993 and its first bilateral FTA with New Zealand in 2001. Since then, Singapore has signed a total of 20 FTAs, of which 18 are in force [Exhibit 1]. Singapore's efforts to pursue FTAs have not been unique, and in fact many other regional economies have followed Singapore's example to pursue FTAs with their key trading partners, with varying levels of success.

Have these FTAs helped to boost Singapore's exports? Singapore's FTAs have benefited Singapore-based exporters by reducing the tariffs that other countries levy on the goods they import from Singapore. Singapore's key FTAs resulted in actual tariff savings of over \$700 million in 2009 and over \$1.1 billion in 2010 for Singapore-based companies. But *tariff savings* alone do not indicate whether the FTAs have boosted the *volume* of exports; tariff savings may still be reaped while the volume declines. A simple comparison of export volumes before and after an FTA also fails to isolate a specific "FTA effect", since factors ranging from economic growth to exchange rate movements could also affect that other country's demand for Singapore's exports. This paper attempts to go beyond superficial (and potentially misleading) indications of the impact of FTAs and assesses whether FTAs have indeed exerted a distinct impact on Singapore's domestic exports of goods (DX). Due to limitations of data and methodology, the analysis of this paper pertains only to exports of goods, and not to the exports of services.

FREE TRADE AGREEMENTS EVALUATED

This paper evaluates the impact of FTAs in force at the end of 2008. A total of 13 FTAs, comprising both bilateral and multi-party FTAs, were in force at that time [[Exhibit 1](#)].

a. **Bilateral FTAs.** Since 2001, bilateral FTAs with 8 countries have entered into force. These are the FTAs with New Zealand, Japan, Australia, the US, India, Jordan, Korea and Panama. The GDP size of these countries vary widely, ranging from one-tenth (Jordan) to nearly 80 times (US) of Singapore's GDP. In 2008, Singapore's DX to these countries totaled US\$182 billion, nearly 30 per cent of its total DX. With the exception of India, these FTAs provided for the elimination of more than 90 per cent of all tariff lines, over periods ranging from 0 to 11 years after the entry into force of the FTA [[Exhibit 2](#)].

b. **Multi-party FTAs.** 5 multi-party FTAs involving Singapore entered into force between 1993 and 2008 [[Exhibit 3](#)]. Of these, the 1993 ASEAN Free Trade Area and the 2003 ESFTA were Singapore's first free trade arrangements with these trading partners.

Exhibit 1: Free Trade Agreements (FTAs) that are in force or have been signed or concluded

	FTAs currently in force	Entry into force
1	ASEAN Free Trade Area (AFTA)	1 Jan 1993
2	New Zealand (ANZSCEP)	1 Jan 2001
3	Japan (JSEPA)	30 Nov 2002
4	Switzerland, Liechtenstein, Norway and Iceland (ESFTA)	1 Jan 2003
5	Australia (SAFTA)	28 Jul 2003
6	US (USSFTA)	1 Jan 2004
7	ASEAN-China (ACFTA)	20 Jul 2005 ¹
8	India (CECA)	1 Aug 2005
9	Jordan (SJFTA)	22 Aug 2005
10	Korea (KSFTA)	2 Mar 2006
11	Trans-Pacific SEP (Brunei, New Zealand, Chile, Singapore)	28 May 2006
12	Panama (PSFTA)	24 Jul 2006
13	ASEAN-Korea (AKFTA)	1 Jun 2007
14	China (CSFTA)	1 Jan 2009
15	ASEAN-Japan (AJCEP)	1 Jan 2009
16	Peru (PeSFTA)	1 Aug 2009
17	ASEAN-India (AIFTA)	1 Jan 2010 ²
18	ASEAN-Australia and New Zealand (AANZFTA)	1 Jan 2010
	FTAs which have been signed but not currently in force	Date signed
19	GCC (GSFTA) (signed)	15 Dec 2008
20	Costa Rica (CRSFTA) (signed)	6 Apr 2010

Source: IE Singapore FTA Network [website](#).

¹ Implementation of the Trade in Goods Agreement with the "ASEAN-6" countries, viz., Indonesia, Malaysia, Thailand, Singapore, the Philippines and Brunei.

² Implementation of the Trade in Goods Agreement.

Exhibit 2: Singapore's Bilateral FTAs in force by end 2008

Partner	Size of Economy (2008, US\$ billions)	Singapore's DX (2008, US\$ billions)	Years Since Entry into Force	Coverage (Per Cent of Tariff Lines)	Staging of Elimination	Per Cent of DX Covered
New Zealand	128	2.7	8	100	Entry into force	100% upon entry into force
Japan	4,924	42.5	6	92.1	8 years	98.5% upon entry into force.
Australia	1,011	18.4	5	100	Entry into force	100% upon entry into force
US	14,265	61.0	5	100	10 years	100% by 2014
India	1,210	20.3	3	46	4 years	75% by 2010
Jordan	20	0.08	3	97.5	10 years	100% by 2015
Korea	947	30.1	2	100	9 years	75% upon entry into force
Panama	23	6.5	2	97	11 years	98% upon entry into force

Source: International Monetary Fund *World Economic Outlook*, IE Singapore.

Exhibit 3: Singapore's Multi-party FTAs in force by end 2008

FTA	Years Since Inception to End 2008	Coverage (Per Cent of Tariff Lines)	Staging of Elimination	Per Cent of DX Covered
ASEAN FTA (AFTA)	16	98.25	ASEAN-6: Over 18 years CLMV: Over 23 years	N.A.
Switzerland, Liechtenstein, Norway and Iceland (ESFTA)	6	99% of industrial goods and all processed agriculture goods	Upon entry into force	99.8% upon entry into force
ASEAN-China (ACFTA)	3	>90	Over 5 years 75% of tariff lines by 2009	N.A.
Trans-Pacific SEP (Brunei, New Zealand, Chile, Singapore)	2	100	Chile: Over 6 years. Brunei and New Zealand: Over 9 years	100% by 2012
ASEAN-Korea (AKFTA)	1	>90	Over 3 years	N.A.

Source: IE Singapore FTA Network [website](#).

PREDICTIONS FROM TRADE THEORY

Trade theory suggests FTAs affect Singapore's DX via the following ways:

- a. **Bilateral FTA.** By reducing tariffs, an FTA reduces the prices faced by consumers in partner countries for Singapore's exports. Exports originating from Singapore may now be cheaper and thus more competitive relative to the partner country's own products, and exports of other countries. Importers may therefore decide to import more of these products from Singapore, instead of producing these goods by themselves or importing from other countries. Hence, bilateral FTAs are unambiguously expected to *increase* Singapore's DX.
- b. **Multi-party FTA.** The same effects of a bilateral FTA apply for a multi-party FTA, which in theory would *increase* Singapore's DX. However, another effect occurs which may lead to a *reduction* in DX. For illustration, assume that *Country A* signs a multi-party FTA with *Country B* and *Country C*. By reducing the barriers between *B* and *C*, both *B* and *C* may decide to trade with each other instead of trading with *A*. This effect may be amplified if *A* had bilateral FTAs with countries *B* and *C* prior to the multi-party FTA, as the multi-party FTA would lead to a bigger reduction in barriers between *B* and *C*. (In Singapore's case, for example, our bilateral FTAs with Japan and Korea existed before the ratification of the multi-party ASEAN-Japan and ASEAN-Korea FTAs.) This effect, which is specific to multi-party FTAs, may cause more trading among the other trading partners, at the expense of Singapore's DX.

The econometric specifications seek to account for these different possibilities.³

METHODOLOGY

To quantify the impact of FTAs on Singapore's nominal DX, we used a panel data set comprising country-level annual data for 18 countries from 1987 to 2008.⁴ These countries account for more than 80 per cent of Singapore's total DX. The mix of countries included countries with which Singapore had (a) bilateral FTAs, (b) multi-party FTAs, and (c) no FTAs, thereby enabling us to compare the differences in DX growth rates across different countries in these different groupings. Details of the econometric analysis may be found in the [Annex](#).

KEY RESULTS

The analysis shows that on average, the entry into force of a bilateral FTA results in a statistically significant increase in Singapore's DX to that particular FTA partner, controlled for other factors such as that country's economic growth or exchange rate changes. On average, Singapore's DX to an FTA partner increased by 18 per cent two years after the entry into force of that FTA, and a further 16 per cent in the third year. The results further indicate that DX *growth rates* revert to pre-FTA trend levels by the fourth year. But because of the cumulative impact of the boost to DX growth rates in the second and third year, the *level* of DX would be much higher by the fourth year than if there had not been an FTA. We find that the effect of improved price competitiveness on the demand for Singapore-originating exports appears to take at least a year to trickle down to actual consumers. It is also possible that the Singapore exporters themselves may take time to understand a new FTA before using it.

³ The ESFTA has been excluded from the study as these countries are not major trading partners with Singapore. Of the four countries, trade data is only available for Switzerland and Norway, and Singapore's DX to these two countries is less than 0.4 per cent of Singapore's total DX.

⁴ Australia, China, France, Germany, Hong Kong, India, Indonesia, Japan, Jordan, Malaysia, Netherlands, New Zealand, Panama, South Korea, Chinese Taipei, Thailand, United Kingdom and United States.

Apart from the bilateral “FTA effect”, the results also show that on average, a 1.0 percentage-point increase in an FTA partner’s GDP growth rate led to an approximately 1.7 percentage-point increase in the growth rate of Singapore’s DX to that particular country. Additionally, a 1.0 percentage-point decline in the value of the Singapore dollar relative to the FTA partner’s currency value led to a 0.6 percentage-point increase in the growth rate of Singapore’s DX to that particular country. Although these coefficients may not be directly comparable, they are of similar magnitudes to existing estimates of trade elasticity.⁵

The impact of the multi-party FTAs appears more ambiguous, as expected. Multi-party FTAs that included partners with whom Singapore had a pre-existing FTA did not have a statistically significant impact on Singapore’s DX to those pre-existing FTA partners.⁶ (As a purely illustrative example, the entry into force of the 2006 Trans-Pacific SEP did not result in a statistically significant impact on Singapore’s DX to New Zealand, with whom Singapore has a pre-existing FTA.) In the multi-party FTAs that included partners with whom Singapore did not have any pre-existing FTA, the analysis indicates that Singapore’s DX to these new partners did not experience any statistically significant increase.⁷

While multi-party FTAs may not lead to the increases in DX that result from the bilateral FTAs, they remain very useful to Singapore. In fact, company-level data and anecdotal feedback suggest that Singapore-based exporters find the multi-party FTAs, and especially the FTAs that ASEAN has with its various dialogue partners (viz., the “ASEAN + 1” FTAs), more “useable”, primarily because of the broader and more flexible rules of origin that these FTAs provide. For instance, the rules of origin of the ASEAN + 1 FTAs include the concept of ASEAN cumulation, which means that Singapore-based exporters can include the value of inputs sourced from other ASEAN countries (and not just Singapore) towards determining whether their exports can benefit from the tariff concessions provided for in that particular FTA.

CONCLUSION

The results affirm that FTAs have in general contributed positively to Singapore’s DX, and hence, Singapore’s economic growth. Our FTAs have given rise not only to a substantial level of actual tariff savings, but also to an increase in the demand for exports originating from Singapore that is distinct from other factors such as GDP growth and exchange rate movements. These results therefore validate the FTA strategy that Singapore has pursued over the past two decades, and underscore the importance of free trade for small, open economies like Singapore.

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⁵ Marquez (1988) finds that for various countries, the income elasticity of imports from “less developed countries” ranges from 0.09 to 1.95. Toh and Chua (2003) find that a 1 per cent increase in the US and EU’s real GDPs lead to a 2.29 per cent and a 0.61 per cent increase in Singapore’s bilateral non-oil domestic exports (NODX) respectively, while a 1 per cent appreciation of Singapore’s real effective exchange rate with respect to the US\$ and Euro lead to a 1.02 per cent and 0.61 per cent decrease in Singapore’s bilateral NODX respectively.

⁶ These are Indonesia, Malaysia and Thailand for the 2005 ASEAN-China FTA, New Zealand for the 2006 Trans-Pacific SEP, and Indonesia, Malaysia, Thailand and Korea for the 2006 ASEAN-Korea FTA.

⁷ These countries are Indonesia, Malaysia and Thailand for the 1993 ASEAN FTA, and China for the ASEAN-China FTA.

REFERENCES

Marquez, J., and McNeilly, C (1988). "Income and Price Elasticities for Exports of Developing Countries," *Review of Economics and Statistics*, 70, 306-314.

Toh, Mun Heng and Chua, Boon Loy (2003). "Factors Affecting the Performance of Singapore's Non-oil Domestic Exports to the US and EU" *Economic Survey of Singapore Second Quarter*.

ANNEX: METHODOLOGY

Pooled Regressions

The pooled results for bilateral FTAs rely on the following general econometric equation:

$$\begin{aligned} growth_DX_{i,t} = & c + \beta_1 growth_GDP_{i,t} + \beta_2 change_xrate_{i,t} + \beta_x year + \beta_y country \\ & + \gamma_1 fta_group1_{i,t} + \gamma_2 fta_group1_{i,t-1} + \gamma_3 fta_group1_{i,t-2} + \gamma_4 fta_group1_{i,t-3} \\ & + \gamma_5 fta_group1_{i,t-4} + \delta_1 fta_group2_{i,t} + \delta_2 fta_group2_{i,t-1} + \delta_3 fta_group2_{i,t-2} \\ & + \delta_4 fta_group2_{i,t-3} + \delta_5 fta_group2_{i,t-4} + \dots \end{aligned}$$

a. $growth_DX_{i,t}$ is the percentage difference in DX from Singapore to Country i in year t compared to year $t-1$. Nominal figures in Singapore dollars are used.

b. $growth_GDP_{i,t}$ is the percentage change of Country i 's real GDP in year t compared to year $t-1$. Theory suggests that an increase in GDP growth of Singapore's trade partners would lead to an increase in their demand for Singapore's exports.

c. $change_xrate_{i,t}$ measures percentage changes in Singapore's nominal bilateral exchange rate with Country i between year t and $t-1$. ($change_xrate_{i,t}$ is expressed as foreign currency per Singapore dollar, and an appreciation is reflected by an increase in $change_xrate_{i,t}$.) Theory suggests that an appreciation of Singapore's bilateral exchange rate would lead to a fall in Singapore's exports, as its goods become relatively more expensive. Summary statistics of the above three variables are in [Exhibit A1](#) below.

Exhibit A1: Summary Statistics

Variable	Mean (Per Cent)	Standard Deviation
$growth_DX_{i,t}$	13.2	0.261
$growth_GDP_{i,t}$	4.4	0.037
$change_xrate_{i,t}$	2.8	0.136

d. $year$ and $country$ variables are fixed effects controls for exogenous differences in trade conditions in a particular year and country respectively. For example, the Australia country fixed effect captures the trade patterns specific to Australia across time, but not to any other country. Similarly, time dummy variables control for effects that are specific to the year but apply across all countries, for example the impact of the 1997/1998 Asian financial crisis. The inclusion of these dummies allows us to control for the year-invariant and country-invariant variables that affect DX, thereby enabling us to better estimate the impact of FTAs.

e. $Groups 1, 2, 3$ and 4 are sub-sets of countries that vary across different econometric specifications. These categories are described in the subsequent paras. $fta_group1_{i,t-k}$ is a dummy variable that takes on the value 1 if an FTA with Country i in $Group 1$ is entered into force in year $t - k$ (where k is 0, 1, 2, 3 and 4), and 0 otherwise. For example, assume that the

US is in *Group 1* for a particular regression specification. Since the FTA with the US was signed in 2004, $fta_group1_{US,t-0}$ is then 1 when Country i is the US and the year is 2004, and 0 otherwise. Similarly $fta_group1_{US,t-2}$ is 1 in year 2006 and 0 otherwise. The respective γ coefficients estimate the average percentage change in DX k years after an FTA with a *Group 1* country is signed. The same follows for fta_group2 , fta_group3 and fta_group4 .

In our analysis, we have grouped the countries in the following ways:

f. **Bilateral FTAs.** The "Bilateral FTA" grouping consists of countries with which Singapore has signed bilateral FTAs. The set of Bilateral FTAs is further sub-divided into two groups, "Bilateral, Immediate" and "Bilateral, Delayed". "Bilateral, Immediate" comprises countries where almost all tariff elimination came into force immediately. These include Australia, Japan and New Zealand. "Bilateral, Delayed" comprises countries where there was a significant delay in tariff elimination even after the FTA entered into force. The countries in this group are India, South Korea, Jordan, and the US. The "Bilateral" group therefore consists of countries in both these sub-groups.

g. **Multi-party FTAs.** Countries with which we have engaged in multi-party FTAs have been divided into two groups. (The sub-groupings are not mutually exclusive.) The "Multi-party (First)" grouping consists of countries whose first FTAs with Singapore were multi-party agreements. Malaysia, Indonesia and Thailand are in the "Multi-party (First)" group, as the 1993 ASEAN FTA was Singapore's first FTA arrangement with these countries. China is also in the "Multi-party (First)" group because Singapore's first FTA relationship with China was through the ASEAN-China FTA in 2005, which came into force prior to the Singapore-China bilateral FTA. The "Multi-party (Repeated)" group comprises countries with which an existing FTA relationship has been established prior to the multi-party FTA. They include the ASEAN countries in 2005 and 2007 (for the ASEAN-China and ASEAN-Korea FTAs), and New Zealand in 2006 (for the Trans-Pacific SEP), as these countries had existing FTA relationships with Singapore prior to their multi-party FTAs.

Details of the groupings may be found in [Exhibit A2](#). [Exhibit A2](#) may be understood in the following manner – [Exhibit A2](#) shows that New Zealand is in the "Bilateral, Immediate" group. If the "Bilateral, Immediate" group corresponds with fta_group1 the value of $fta_group1_{New\ Zealand,2001}$ is 1.

Exhibit A2: Country Groups by Year FTA Entered into Force

Group	Bilateral FTA	Bilateral, Immediate	Bilateral, Delayed	Multi-party (First)	Multi-party (Repeated)
1993				Indonesia, Malaysia, Thailand	
2001	New Zealand	New Zealand			
2002	Japan	Japan			
2003	Australia	Australia			
2004	US		US		
2005	India, Jordan		India, Jordan	China	Indonesia, Malaysia, Thailand
2006	Panama, South Korea		Panama, South Korea		New Zealand
2007					Indonesia, Malaysia, Thailand, South Korea

A summary of the pooled analysis results is presented in [Exhibit A3](#).

Exhibit A3: Summary Results of Growth in Singapore's Domestic Exports

Independent Variables	Coefficients (Robust Standard Errors)			
	(1)	(2)	(3)	(4)
Regression				
<i>fta_group1</i>	Bilateral FTA	Bilateral, Delayed	Bilateral FTA	Bilateral, Delayed
<i>fta_group2</i>		Bilateral, Immediate		Bilateral, Immediate
<i>fta_group3</i>	Multi-party (First)	Multi-party (First)	Multi-party (First)	Multi-party (First)
<i>fta_group4</i>			Multi-party (Repeated)	Multi-party (Repeated)
<i>growth_GDP_{i,t}</i>	1.676** (0.777)	1.685** (0.779)	1.717** (0.788)	1.724** (0.790)
<i>change_xrate_{i,t}</i>	-0.596** (0.156)	-0.593** (0.156)	-0.590** (0.157)	-0.588** (0.158)
<i>fta_group1_{i,t-0}</i>	-0.028 (0.082)	-0.065 (0.120)	-0.021 (0.082)	-0.055 (0.121)
<i>fta_group1_{i,t-1}</i>	0.101 (0.098)	0.197 (0.133)	0.102 (0.100)	0.200 (0.139)
<i>fta_group1_{i,t-2}</i>	0.177** (0.067)	0.170** (0.067)	0.182** (0.070)	0.173** (0.072)
<i>fta_group1_{i,t-3}</i>	0.161* (0.085)	0.122 (0.079)	0.171* (0.089)	0.132 (0.090)
<i>fta_group1_{i,t-4}</i>	0.007 (0.069)	-0.154** (0.070)	0.023 (0.074)	-0.152* (0.086)
<i>fta_group2_{i,t-0}</i>		0.043 (0.080)		0.046 (0.082)
<i>fta_group2_{i,t-1}</i>		-0.053 (0.101)		-0.051 (0.101)
<i>fta_group2_{i,t-2}</i>		0.185 (0.139)		0.190 (0.143)
<i>fta_group2_{i,t-3}</i>		0.197 (0.149)		0.207 (0.151)
<i>fta_group2_{i,t-4}</i>		0.063 (0.069)		0.083 (0.070)
<i>fta_group3_{i,t-0}</i>	-0.031 (0.122)	-0.029 (0.124)	-0.020 (0.125)	-0.019 (0.126)
<i>fta_group3_{i,t-1}</i>	0.111 (0.188)	0.116 (0.188)	0.123 (0.190)	0.128 (0.190)
<i>fta_group3_{i,t-2}</i>	-0.122 (0.081)	-0.121 (0.081)	-0.104 (0.084)	-0.104 (0.084)
<i>fta_group3_{i,t-3}</i>	-0.165** (0.053)	-0.167** (0.054)	-0.155** (0.061)	-0.159** (0.063)
<i>fta_group3_{i,t-4}</i>	0.066 (0.061)	0.066 (0.062)	0.079 (0.065)	0.078 (0.066)
<i>fta_group4_{i,t-0}</i>			0.054 (0.062)	0.044 (0.068)
<i>fta_group4_{i,t-1}</i>			0.052 (0.062)	0.061 (0.062)
<i>fta_group4_{i,t-2}</i>			0.078 (0.091)	0.084 (0.094)
<i>fta_group4_{i,t-3}</i>			-0.071 (0.084)	-0.093 (0.092)

* denotes significance at the 10% level. ** denotes significance at the 5% level.

Robust standard errors presented. Country and year fixed effects included.

314 observations.

The regression in [Exhibit A3, Column \(1\)](#) forms the basis of our analysis. The regressions in [Columns \(2\) to \(4\)](#) serve as robustness checks, and provide additional insights. [Column \(1\)](#) indicates that on average, bilateral FTAs have a positive and significant impact on Singapore's exports to its FTA partners. In particular, the shaded coefficients suggest that bilateral FTAs led to an 18 per cent increase in Singapore's DX to that particular country two years after the FTAs came into force. The bilateral FTAs led to another 16 per cent increase in DX in the third year. The coefficient of the impact of the FTA on DX in the first year after the FTA entered into force is positive but insignificant. The results suggest that DX growth rates revert to normal 4 years after the FTA is signed.

Considering the results in [Columns \(2\), \(3\) and \(4\)](#), the results in [Column \(1\)](#) are relatively robust, as the coefficients that are statistically significant generally remain significant across the regression specifications. The magnitudes of the statistically significant coefficients are also largely similar.

In [Columns \(2\) and \(4\)](#), we observe that the coefficients for the "Bilateral, Immediate" group are not statistically significant. This suggests that bilateral FTAs which have immediate tariff reductions may not have any significant and distinct impact on Singapore's DX.

In [Columns \(3\) and \(4\)](#), we observe that the coefficients for the "Multi-party (Repeated)" group are not statistically significant.

Apart from the FTA analysis, the results also show that a 1.0 percentage-point increase in a foreign country's GDP growth rate led to a 1.7 percentage-point increase in the growth rate of Singapore's domestic exports. Additionally, a 1.0 percentage-point depreciation in the Singapore-foreign bilateral exchange rate led to an increase in the growth rate of Singapore's domestic exports by 0.6 percentage-points. Although these coefficients may not be directly comparable, they are of similar magnitudes to existing estimates of trade elasticity.

We also conducted an F-test on the sum of the bilateral FTA and multi-party FTA coefficients ([from Column \(1\)](#)) over a period of five years (from the year the FTA enters into force to four years after). The results [[Exhibit A4](#)] show that the cumulative impact of the bilateral FTA is statistically significant, while that for the multi-party FTA is not.

Exhibit A4: F-test Statistic

	F-test statistic
Bilateral FTA	F(1,17)=5.99 Prob>F=0.0255
Multi-party FTA	F(1,17)=0.18 Prob >F=0.6805