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ABSTRACT

This paper examines exporters' response to tariff concessions offered under the ASEAN Free Trade Area (AFTA), using evidence from Thai manufacturing during the period 2003-06. The methodology involves examining determinants of intra-product differences in export performance while distinguishing between actual and preferential trade. The findings suggest that tariff concessions are significantly underutilized by exporters because of binding rules of origins; the nature of trade between Thailand and other ASEAN countries, largely driven by the product fragmentation phenomenon; the presence of tariff exemption schemes; and the narrow preferences margins in many product lines. In addition, there is evidence that the rate of utilization of tariff concessions is far greater among local firms, in particular large local conglomerate firms, compared to foreign firms. The key policy inference is that, given the nature of trade integration in Southeast Asia and the already low levels of protection achieved through unilateral liberalization over the years, AFTA is unlikely to play a significant role in promoting intra-regional trade; it is simply a distraction from the main game of multilateral and unilateral trade reforms, which have so far played a pivotal role in the economic success of countries in the region.

Key words: Free Trade Agreement, Rules of Origin, Thailand, ASEAN Free Trade Area
JEL: F15, F53, O19, O53

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1. Issues

Proliferation of free trade agreements (FTAs) has been one of the most notable phenomena in the world economy over the past 15 years. FTAs have become the dominant form of international cooperation on trade policy for virtually all members of the WTO, with the exception of Mongolia. The number of FTAs notified to the World Trade Organization (WTO) tripled from around 124 in 1994 to 370 by August 2008, more than half of which are currently in force.[1] Interestingly, half of them are in the Asia and Pacific region, the center of global trade dynamism, and engender far-reaching implications, not only for the philosophy and operation of the multilateral trading system, but also for the day-to-day conduct of cross-border trade.

In general, FTAs usually involve liberalising trade among the member countries. However, their actual impact on trade is not as straightforward as we usually expect from multilateral and/or unilateral liberalization. Indeed, an FTA deal could well be considered 'preferential', meaning it will discriminate against nonmember countries, depending on the rules of origins (RoOs)— the rules to prove the originality of good for the purpose of determining eligibility for tariff concessions. Whether RoO are used as a vital commercial policy instruments depends on how they are designed and implemented.[2] Therefore, export opportunities created by a given FTA (henceforth referred to FTA export creation) are essentially an empirical issue.

So far there has not been any systematic analysis of trade-flow effects of FTAs because of the limited access to administrative records of FTA implementation. What has been done in previous studies is simply to estimate a gravity model with a binary dummy variable to distinguish between FTA members countries from non-members. (e.g. Magee, 2003, 2008; Soloaga &Winters, 2001; Bayoumi & Eichengreen, 1995;

[1]Further details are available at http://www.wto.org/english/tratop_e/region_e/regfac_e.htm#top.

[2] There are a number of studies arguing that RoO have been used as vital commercial policy instruments to mould RoOs to the benefit of especial interest groups (Vermulst & Waer 1990, Krueger 1999, Bhagwati et al. 1999, Falvey & Reed 2002, Estevadeordal & Suominen 2004, James 2005, and Krishna 2005).

Athukorala & Yamashita; 2006).[3] This approach ignores the 'conditioning effects'' of RoOs by implicitly assuming that tariff concessions offered by FTAs are readily available to the exporters. In other words, this approach does not make a distinction between actual and preferential trade where the latter reflects transactions recorded in administrative records of FTA implementation. Such an assumption is rather restrictive:[4] the few available studies of the actual utilization of FTA concessions suggest that the actual utilization rates differ considerably among FTAs (JETRO, 2003; Augier et al., 2005; Kohpaiboon, forthcoming).[5] Whether or not tariff concessions are readily available to private firms depends on how restrictive the RoOs are. In addition, firms' decision to apply for tariff concessions depends on the existing margin between general (most-favored-nation) and preferential tariff rates (henceforth referred to as the tariff margin) and the costs incurred in applying for the concessions. Hence, the magnitude of FTA export creation based on actual trade data can be overstated and misleading.

Against this backdrop, this paper sets out to examine the response of exporters to tariff concessions offered under the ASEAN Free Trade Area (AFTA) with a view to informing the debate on how to design RoOs and administrative procedures for enhancing trade-creation effects of FTAs. The analysis makes use trade preferences and their actual utilization rates estimated using the administrative records of AFTA implementation in Thailand. In order to indicate the response of the private sector to AFTA export creation, AFTA utilization (AFTAU), the ratio between the administrative records and actual trade, is calculated. The calculated AFTAU is further used as the

[3]A number of studies have conducted simulation experiments using computable general equilibrium (CGE) models to examine trade flow effects of FTAs (e.g. Karemer & Ojah, 1998; Wylie, 1995; Brown et al., 1992; Clausing, 2001; Chirathivat, 2004). A major limitation of these *ex ante* studies is the failure to incorporate RoOs which plays a key role in determining actual trade effect of any FTA.

[4]See Soloaga & Winters (2001) and Baier & Bergstrand (2007) and the works cited therein.

[5] For example, JETRO (2003) finds the preference margins (the ratio between preferential to actual trade) among ASEAN members in 2002 are quite low at 11.2 and 4.1 %, respectively, for Thailand and Malaysia. This finding is consistence with that of Augier et al. (2005) for FTA between EU and southern Mediterranean countries and three central and eastern European countries (i.e. Czech Republic, Poland, and Hungary).

dependent variable in an inter-product cross-sectional econometric analysis in order to gain a better understanding of the patterns of AFTAU across products.

AFTA is selected in this study because it is one of the few South-South FTAs in which tariff reduction programs were completed by 2003 and thus sufficient time has passed to assess their impact. In addition, the future direction of AFTA is now in the centre of policy debate. A number of studies argue for either enlargement of AFTA membership e.g. ASEAN-China, ASEAN plus 3, ASEAN plus 6 (Tongzon, 2005; Kumar, 2005) or deepening the current level of economic integration (e.g. custom union, economic union) (Plummer, 2006). The ASEAN member governments have responded positively to these proposals as reflected in the proposal of the ASEAN Economic Community (AEC) launched in the ASEAN Summit in 2003 in Bali.[6] The findings of this study would be directly relevant to this policy debate.

Thailand is suitable as a case study of this subject for two reasons. Firstly, administrative records for AFTA implementation of Thai exporters are available for the period 2003-06. This allows us to undertake a systematic analysis of AFTA utilization by Thai exporters. Secondly, Thai exporters have the potential to utilize tariff concessions offered by AFTA because the Thai manufacturing sector is relatively broad based, compared to neighbouring countries.

The organization of this paper is as follows: Section 2 presents an analytical model of FTAs that helps delineating the key factors influencing decisions to apply for AFTA tariff concessions. Beginning with a brief history of AFTA, Section 3 illustrates trends and patterns in the administrative records of AFTA implementation. The empirical model is presented and data used for the study's econometric analysis are presented in Sections 4 and 5 respectively. Econometric procedure and results are presented in Section 6. Conclusions and policy inferences are in the final section.

[6] In addition, the AEC Blueprint was agreed by ASEAN leaders in Novembers 2007. It provides a comprehensive framework to establish the AEC.

2. Analytical Model

Free trade agreements (FTAs) are a form of economic integration in which two or more countries (referred to as member countries) offer each other duty free access while maintaining their own external tariffs. Since FTAs usually offer zero import tariffs, they can promote trade among member countries.[7] Not all the increased trade among members improves overall welfare because of its discriminatory nature in favor of member countries. On many occasion, FTAs might diversify trade away from more efficient non-member countries to less efficient member ones (i.e. trade diversion). In such circumstances, prices of goods offered to consumers will be lower, but by less than the foregone tariff revenues, thereby lowering social welfare.

Nevertheless, the zero tariff trade offered in FTA does not necessarily materialize. This depends on a number of factors. In this study, the partial equilibrium model developed in Cadot *et al.* (2002) is used with some modifications to identify these potential determinants of the rate of FTA utilization. Specifically, we modify the original model to include industry-specific characteristics to influence this decision used in our empirical analysis. Suppose that a final product (*F*), is produced by labor (*L)* and an intermediate product (*I*) according to the following technology expressed in equation 1. Total intermediates are composed of two types, one is produced by member countries (*M)* and the other non-member countries, denoted by the superscript, *M* and *N*.

$$F = Min\left\{\frac{L}{a_L}, \frac{\left(I^M + I^N\right)}{a_I}\right\} \tag{1}$$

where a_L and a_I are the input-output coefficient of labor and intermediate goods, respectively.

[7]This happens regardless the nature of increased trade, i.e. trade creation or trade diversion.

In equation 1, I_M and I_N are assumed to be physically perfect substitutes. We assume that the latter's price is equal to world price $\left(P_I^N = P_I^W\right)$ but lower than that of the former ($\left(P_I^W < P_I^M\right)$.

Let us assume that there are three countries, Countries A, B, and rest of the world. Country A is a producer and exporter of product *F* and Country B is the importer with a tariff rate of t_F So, consumers in Country B will pay $P_F^W\left(1+t_F\right)$. If Countries A and B form a FTA, goods produced in one of the two countries can be exported to the other at preferential (reduced) tariff rates $\left(t_F^{FTA}\right)$ provided that they satisfy RoO.[8] Assuming that RoO under the FTA between Countries A and B is in a regional value content form in which goods will be eligible if and only if intermediate inputs sourced from member countries (local content of the products) reach the agreed level. That is,

$$I_M \geq \alpha\left(I_N + I_M\right) : \alpha \in (0,1) \tag{2}$$

Equation 2 stresses that intermediates sourced from member countries $\left(I_M\right)$ must exceed α *100 per cent of total intermediates used. The higher the value of α, the more restrictive the RoO. When $\alpha = 0$, RoO do not have any restrictive impact and I_N and I_M can be any non-negative number. In contrast, $\alpha = 1$ implies that all intermediates must come from member countries.[9] For simplicity, we assume that Country B does not produce the intermediate product and, thus, does not protect it.

When $P_I^W < P_I^M$ and assuming RoO constraints are binding, the inequality sign in equation 2 turns out to be an equality sign, which is then rearranged into equation 3;

[8] An FTA allows member countries maintain their own external tariffs. In order to prevent trade deflection resulting from differences in external tariffs of member countries (that is the possibility that non-member countries could take advantage by exporting to the country which tariff concession for member countries in an FTA have to be coupled with RoO which specify the conditions under which a good becomes eligible for zero tariffs in an FTA.

[9] Equation 2 makes sense if and only if I^N equals to zero.

$$I^M = \frac{\alpha}{1-\alpha} I^N \tag{3}$$

What Equation 3 indicates is, producers of Product *F* in Country *F* need to source local intermediates ($I^M \neq 0$) in order to apply for FTA tariff concessions. Consequently, the average price of the intermediate product incurred by producers of Product *F* in Country A is the weighted average between world price and domestic price with α as a weight (equation 4).

$$\bar{P}_I = \alpha P_I^M + (1-\alpha) P_I^W \tag{4}$$

Equation 4 shows that the binding RoO constraints act as tariffs on intermediates. If we consider $tq_I^M = \frac{P_I^M - P_I^W}{P_I^W}$, the implicit tariff of intermediates would be αtq_I^M. To illustrate the net impact on the resource pulling effect of FTA, value added in two different scenarios, applying and not applying for FTA tariff concessions, (VA^{FTA}, and VA^W respectively) is compared. That is, Firms in country A would apply for FTA tariff concessions when value added in the former is greater than the latter.

$$\begin{aligned} NB^{FTA} &= VA^{FTA} - VA^{WORLD} \\ &= \left(t_F - t_F^{FTA}\right) P_F^W - a_I \alpha tq_I^M P_I^W \end{aligned} \tag{5}$$

where $VA^{FTA} = P_F^W \left(1 + t_F - t_F^{FTA}\right) - a_I \bar{P}_I$

$VA^{WORLD} = P_F^W - a_I P_I^W$

That is, firms in country A are eligible for FTA tariff concession if, and only if, $NB^{FTA} > 0$. According to equation 5, FTA utilization is related positively to the margin between general (MFN) and preferential tariff rates and negatively to the degree of restrictiveness of RoO.

3. ASEAN Free Trade Area (AFTA) and Its Utilization

3.1 Overview of AFTA

On 27-28 January 1992, heads of state of the Association of Southeast Asian Nations (ASEAN) met in Singapore for the Fourth ASEAN Summit Meeting, at which they agreed to the establishment of an ASEAN Free Trade Area (AFTA) by the year 2008. This deadline has subsequently been moved forward to the year 2003. The backbone of AFTA is the Common Effective Preferential Tariff (CEPT) scheme, the core tariff reduction program, which aims to reduce tariffs to 0-5 per cent for goods from other ASEAN members. The proposed trading bloc in ASEAN members was partly a response to the establishment of other trading blocs, such as the North American Free Trade Area (NAFTA), which began their negotiations long before launching of the European Economic Community (EEC) in 1992 and the competitive threats emanating from the global integration of two Asian giants, China and India (Kumar, 2005; Kohpaiboon, 2007)

By January 2003 the six original ASEAN members (namely Brunei, Indonesia, Malaysia, Philippines, Singapore and Thailand) have almost finished tariff reduction among themselves, effectively bringing AFTA to completion. More than 90 per cent of tariff lines were subject to 0-5 per cent tariff by 2003. Hence, as far as the original ASEAN members are concerned, AFTA has left the formation stage to enter the stage of utilization. A CEPT scheme for the new member countries is expected to be completed before 2015.

Table 1 presents the margin between general and preferential tariff rates (i.e. the tariff margin) of major Southeast Asian countries in 2006. Singapore is excluded from Table 1 simply because its general tariff rates are virtually zero. Information in Table 1 begins with the general tariff between two periods, 1995 and 2006, in order to illustrate unilateral tariff cuts in these countries over the past decade. Both the weighted and unweighted averages of preferential tariffs are presented, followed by the distribution of their tariff margin at the six-digit HS classification.

Three inferences can be drawn from Table 1. Firstly, the original ASEAN countries experienced a substantial reduction in general tariffs between 1995 and 2006. By 2006, the weighted average value of general tariffs was around five per cent, more or less. When the unweighted average tariff is concerned, Thailand had the highest figure at above 10 per cent, whereas the Philippines had the lowest at 6.9 per cent. Indonesia and Malaysia were in the middle at 6.9 and 7.2 per cent, respectively. The only exception is Vietnam whose average MFN tariff was still above 15 per cent by 2006. Secondly, because of the substantial reduction in the general tariff of major ASEAN economies, the tariff margins of AFTA are in the narrow range of 4-14 per cent. Thirdly, more than 60 per cent of total tariff lines have a margin less than 5 per cent. With regard to original ASEAN members, the tariff margin was the greatest in Thailand. Nearly 20 per cent of tariff lines are subject to a more than 20 per cent margin. Even though Thailand has advanced its tariff restructuring program and announced three rates of tariff, 0-1 per cent, 5 per cent and 10 per cent for raw materials, intermediates and finished products, respectively, there are a number of exceptional items whose tariff exceeds 30 per cent.

Not only the preference margins are narrow but also there are additional administrative costs involved in benefiting from them (as is the case with any FTA). In other words, exporters must prove that the goods comply with RoO before receiving tariff concessions. RoOs of AFTA differ between primary (agricultural products and minerals) and manufacturing goods. In the case of former the entire whole production process must be performed within ASEAN member countries. This is unlikely to be a binding constraint given the very nature of the production processes of these products. For manufactured goods, RoOs are based on the regional value content: Inputs from ASEAN member countries must account for at least 40 per cent of their associated gross output value. The only exception to this is textiles and garments for which an alternative 'substantial transformation' rule applies.[10]

[10] In August 2007, AFTA introduced 'HS shifting' (that is shift of an imported good from one tariff lines of the Harmonized System of classification to another on the export side) as an alternative to the regional value content requirement with a view to providing exporters with greater flexibility in utilizing AFTA tariff concessions.

3.2 Trends and Patterns of AFTA Implementation

The AFTA is administered in Thailand by the Bureau of Preferential Trade (BPT), Department of Foreign Trade, Ministry of Commerce. All exporters who want to apply for AFTA preferential tariff must fill in Form-D in order to provide necessary information related to product originality. If products comply with AFTA RoO, official records of certificate of origin (c/o) will be issued. Since issuing c/o certificates takes a couple of days, a firms can request for official c/o in advance (i.e. three months). The BPT provided us with access to data on FTA administrative records for the period 2003-present (2006). Original data are available at the six-digit level of the Harmonized System (HS) classification.

Figure 1 depicts exports and imports extracted from the BPT administrative records for the period 2003-06. Even though the core analysis in this paper is on export impact, analysis on import is reported here for the sake of completeness. According to these data, exports from Thailand to ASEAN members under the FTA concessions increased substantially in the first year, from $2,560 million to $4,075 million between 2003 and 2004. And then they steadily grew to $5,509 million in 2006. These exports are far lower than what Thailand actually exported to ASEAN members; the utilization of AFTA (*AFTAU*) measured by the ratio of administrative records to total export varied in the narrow range of between 15.4% and 20.3% during 2003-06. Patterns of the administrative records observed from the import side (Thailand imports from ASEAN members) are, to a large extent, similar to those of the export side. Imports increased dramatically only in the first year and then were stagnant in three following years. By 2006, their value was around $ 3,077 million. Their utilization rates were around 11-16 per cent, lower than the rates corresponding to the export side.

Interestingly, AFTAU observed from both export and import sides are low by international standards. For example, the utilization rate of Mexican export to the United States under Northern American Free Trade Agreement (NAFTA) was at around 60 per cent in 2004-05. The utilization rate of Chilean exports to the United States was around 55-56 per cent in 2005-06 (James, 2006).

The low AFTAU would be due to the nature of trade between Thailand and ASEAN members. Specifically, trade between Thailand and other ASEAN countries over the past two decades has been dominated by parts and components as a consequence of the increasing importance of the product fragmentation phenomenon in global trade and East Asia in particular (Athukorala, 2006). Machinery and transport equipment (SITC 7) is the most important item of trade between Thailand and other ASEAN countries since the late 1980s. Between 2004 and 2005, SITC 7 accounted for nearly 60 per cent of non-oil trade between Thailand and other ASEAN members (both import and export). Figure 2 illustrates the increasing importance of SITC 7 in the total trade between Thailand and other ASEAN members. A share of SITC 7 in both export and import sides increased from negligible level to nearly half of trade between Thailand and other ASEAN countries.[11] When SITC 7 is excluded from consideration, ASEAN members are not the major trading partners of Thailand, as opposed to the United States and the European Union.

Table 2 presents the top ten items of both import and export of SITC 7 at the three-digit level of disaggregation during the period 2003-06. On the export side, the top ten items are reported, together with their corresponding import tariff rates in Indonesia, Malaysia, the Philippines and Vietnam. On the import side, in addition to the corresponding tariff margin Thailand offered in the CEPT scheme, the last column reports a value share of imports applying for tariff exemption scheme by Thailand's Board of Investment (BOI). The key inference of Table 2 is that most of these top ten items on both export and import sides are parts and components. Their existing tariff was low as a consequence of the information technology agreement (ITA) (Fliess & Sauve, 1997) so that the tariff margin is low. In addition, based on the Thai experience, a large proportion of imported parts benefited from BOI tariff exemptions so that tariff concession offered by AFTA would be redundant. The only two exceptions are SITC

[11] The slight decline observed between 2004 and 2005 was a consequence of oil price hike as well as commodity price boom. Trade of primary products increased noticeably.

784 and 785, parts of trucks and motorcycles, respectively, whose tariff margin is extremely high.

Five ASEAN members, namely Indonesia, Malaysia, the Philippines, Singapore and Vietnam accounted for nearly 100 per cent of official exports recorded during the period 2003-06. This is simply a reflection of the progress in tariff reduction under the CEPT Scheme in which the six original ASEAN members have almost finished tariff reductions by 2003. The exception is Vietnam which progressively cut tariffs under the CEPT Scheme. The corresponding figure on the import side was similar (Table 3). Hence, discussion on the disaggregated level will emphasize these five economies. Clearly, the utilization rate varied noticeably across countries, but was rather steady over periods. In addition, there was not any significant difference in patterns of the export and import utilization rate. Indonesia registered the highest utilization rate at nearly 50 per cent in 2006, whereas Singapore had the lowest. The Philippines and Malaysia are somewhere in between Indonesia and Singapore, but the former's utilization rate was higher than that of the latter. The non-zero utilization rate in Singapore reflects the transshipment practice of Singaporean companies in their trade among ASEAN members.[12] The higher utilization in Indonesia and the Philippines compared to that in Malaysia is largely due to the presence of intra-regional trade in vehicles (Kohpaiboon, 2006a, 2006b). Specifically, Indonesia, the Philippines and Thailand are used for production bases by MNE carmakers. Each country is specializing in different types of vehicles so that vehicles manufactured in a country are exported to the other locations (Kohpaiboon, 2006a). Since import tariffs on vehicles in these three countries still exceed 20 per cent and carmakers have long experience in dealing with government officials regarding local content requirements imposed prior to 2000[13], all vehicle trade among ASEAN members apply for preferential tariffs offered in AFTA, i.e. AFTAU was

[12]For example, Singaporean companies assigned their affiliates/subcontractors in Thailand export to Malaysia. The actual trade flow would be Thailand export to Malaysia. In order to eligible for tariff concessions, goods must be proven their product originality in Thailand in which actual production process is undertaken. In such a circumstance, official records of AFTA implementation are shown as exports from Thailand to Singapore.

[13] Carmakers are to large extent familiar with dealing with government officials and revealing their cost structure as required by RoO.

100 per cent (Kohpaiboon, 2006b: Table5). Malaysia has been excluded from the regional networks of production and trade in automobiles because of its national car policy (Kohpaiboon, 2006a). Thus, AFTAU in the case of Malaysia is relatively low, compared to Indonesia and the Philippines. In the case of Indonesia, the high utilization also reflects the imposition of non-tariff barriers (NTBs) on agricultural imports (*bea masuk terbhan*) (Fane & Warr, 2006) so that many Thai agriculture exporters opt to apply AFTA preferential tariffs to alleviate additional costs incurred by the NTBs.[14]

Even though tariff reductions under the CEPT Scheme have not been completed in Vietnam, the tariff margin is substantial. For example, the weighted and unweighted averages of tariff margin in 2006 were 10 and 14 per cent, respectively. Given the fact that Vietnam is still in the process of opening up to the global economy, applying AFTA privileges would be a way to bypass any bureaucratic cumbersomeness in customs procedure. As a result, AFTAU in the case of Vietnam has been high.

4. Empirical Model

As discussed in Section 2, *AFTAU* is related positively to the tariff margin and negatively to the degree of RoO restrictiveness. While the former is directly measured by the difference between general (most-favored-nations) and preferential tariffs, $\left(t_i - t_i^{FTA}\right)$, the latter is proxied by the extent to which goods manufacturers procure raw materials and intermediates locally, i.e. backward linkages index $\left(BLI_i\right)$. BLI_i is a sensible proxy simply because during the study period (2003-2006), the RoO of AFTA was a regional value content-requirement. BLI_i is constructed based on the Leontief inter-industry accounting framework which provides for the capture of both direct and indirect (inter-sectoral) repercussions in the measurement process. BLI_j shows the total units of output required, directly and indirectly, from all sectors (including the unit of output delivered to final demand by the given sector) when the demand for the j^{th} commodity rises by one

[14] For example, official tariff on food crops (rice and corn) is 3 per cent compared to an actual tariff of 8 per cent (Fane & Warr, 2006).

unit. The higher the BLI_j, the greater the ability an industry j^{th} possesses in complying with RoO. Hence, the positive sign of coefficient corresponding to BLI_j is expected.

In addition to $t_i - t_i^{FTA}$ and BLI_i, three industry-specific factors are incorporated into the model, based on the fact that compiling with RoO is often quite expensive to document (e.g. Koshien, 1983; Herin, 1986; Kruger, 1999; James, 2006). This necessitates incurring additional costs which discourages firms from apply for tariff concessions. Such costs include not only administrative fees, but also opportunity costs when firms must set up a group of people in order to deal with all the requirements from government officials (e.g. calculating regional content, reporting sources of imported intermediates and their corresponding prices, matching tariff lines, etc.). All are referred to as the administrative cost. Therefore, it seems sensible to assume that the administrative costs are fixed. In the presence of fixed costs, role of firm behavior in deciding to apply for AFTA tariff concessions would be expected.

These three industry-specific factors are foreign presence, the degree of existence of conglomerated firms and the 'initial trading position', that is the volume of trade at the time when AFTA becoming effective. Firstly, it is likely that foreign firms behave differently from local ones in a number of aspects, including applying for AFTA tariff concessions. Foreign firms, on the one hand, tend to be larger in size so that it is more likely for them to absorb the administrative costs as opposed to local firms. Thus, a positive relationship between foreign presence and utilization rate is expected. Nevertheless, as argued in the multinational enterprises and product fragmentation literature (e.g. Jones, 2000; Jones & Kierzkowski, 2001: Athukorala, 2006), efficiency-seeking FDI have become increasingly important in East Asia over the past two decades. More importantly, these multinational enterprises (MNEs) tend to be located in export processing zones in order to receive input tariff exemption. Therefore, foreign firms might not be attracted to AFTA tariff concessions. The relationship between foreign presence and FTA utilization could be negative. Hence, the relationship between foreign presence (*FOR*) and $AFTAU_i$ is ambiguous.

Foreign presence (FOR_i) is measured by the proportion of the output share of foreign firms to that of the industry as a whole. In some previous empirical studies, employment or capital share of foreign firms have been used to measure foreign presence. Expressing the foreign presence as an employment share tends to underestimate the actual role of foreign affiliates because MNE affiliates tend to be more capital intensive than locally non-affiliated firms. On the other hand, capital share can easily be distorted by the presence of foreign ownership restrictions. Such a restriction was in effect in Thailand during the study period (Kohpaiboon, 2006a). Capital share would not be a good proxy for the foreign presence in a country in a case such as Thailand where there is a foreign ownership restriction. Consequently, output share is the preferred proxy.

Thirdly, the share of conglomerate firms (CON_i) is introduced in the model to capture the firm size effect on AFTAU. In this study, a conglomerate firm is defined as firms in which the same ultimate parent has a majority-ownership share and then their output share to total industry is calculated. The conglomerate firm would be in a better position, as opposed to small and medium firms, in spreading the fixed administrative costs incurred. Therefore, the sign of coefficient corresponding to *CON* is expected to be positive. Thirdly, the initial trade before AFTA effective (INT_i) is added simply because in the presence of fixed costs involved, sales volumes must reach a certain level in order to avoid excessive per-unit fixed costs (economies of scale). Hence, a positive relationship between INT_i and $AFTAU_i$ is expected.

Finally, three country-specific dummy variables are included in the model to capture any possible country-specific effects. They are *INDO*, *MALAY*, and *PHIL*. For example, *INDO* = 1 when an observation under consideration belongs to the records of Thailand exports to Indonesia and zero otherwise. This is similar with *MALAY* and *PHIL*. Note that in this study Vietnam is used as the treatment group when making analysis.

All in all, the empirical model of determinants of *AFTAU* is as follows;

$$AFTAU_i = g\left(t_i - t_i^{FTA}, BLI_i, FOR_i, CON_i, INT_i, INDO, MALAY, PHIL\right)$$

where $AFTAU_i$ = AFTA utilization (the ratio between the official record of AFTA implementation and actual exports) in industry i^{th}

$t_i - t_i^{FTA}$ (+) = the margin between general and preferential tariff rates in industry i^{th}

BLI_i (+) = the degree of backwad linkage index of industry i^{th} as a proxy of the ability of products to compile with RoO

FOR_i (+/-) = the degree of foreign presence in industry i^{th} proxied by the output share of foreign firms

CON_i (+) = the degree of conglomeration in industry i^{th} proxied by the output share of conglomerate firms as defined in the text above

INT_i (+) = the export value in the pre-AFTA period proxied by the average export value during the period 2000-02 for Indonesia, Malaysia and the Philippines and the period 2003-06 for Vietnam.

INDO (?) = a zero-one dummy variable; 1 if observation is from Indonesia and zero otherwise.

MALAY (?) = a zero-one dummy variable; 1 if observation is from Malaysia and zero otherwise.

PHIL (?) = a zero-one dummy variable; 1 if observation is from Philippines and zero otherwise.

(The theoretical expected signs are in the parentheses)

5. Data Description

Originally, the administrative records of AFTA implementation are at the HS six-digit level of disaggregation. The original data have two main limitations. Firstly, there are a

number of c/o records whose HS codes do not fit any official definition, either HS 1996 or 2002 Revisions. For example, the administrative records reported export values of HS 200890, 321010, 350210 from Thailand to Indonesia for 2003 records. Such items do not fit the official definition. Presumably, such errors occur because private firms had difficulties in specifying product categories in filling out c/o forms at the highly disaggregation level. To overcome this problem, the original data at six-digit levels are combined into four digit levels. The second problem is that there are many cases in which *AFTAU* exceeds 100 per cent. There are two possible explanations for the excessive *AFTAU*. Firstly, it is simply due to errors in the data collection process, referred to as Type I Error. Secondly, since official c/o can be issued in advance (see above), exporters tend to overstate their true demand more than they actually need in order to gain flexibility in doing business. As a result, it is possible for *AFTAU* to exceed 100 per cent (referred to as Type II Error). If it is Type II Error, we would not expect vast differences between c/o records and actual export values. In this study, we arbitrarily use a 120 per cent *AFTAU* to identify Type I Error. Specifically if *AFTAU* exceeds 120 per cent, it is classified as Type I Error. As a result, there are 220 out of 4,236 observations subject to Type I Error. The sensitivity analysis of a 120 per cent criterion level (around this neighbourhood) suggests the number of Type I Errors remains more or less the same.[15] Only observations which are subject to Type I Error are dropped from the sample.

Our econometric analysis will focus on manufacturing products which account for around 75 % of exports from Thailand to Indonesia, Malaysia, the Philippines and Vietnam. The definition of manufacturing products in this study follows the International Standard of Industrial Classification (ISIC) and international concordance is used to match with the HS system (i.e. 25-97 net of other primary products). Agricultural and other primary products are excluded because key determinants of AFTAU in these products tend to be different to manufacturing. For example, the RoO constraint is

[15] The number of observations subject to Type 1 error was 209 under the criterion of 125 per cent. This increased to 234 under the criterion of 115.

unlikely to be binding. In addition, as argued in Fane & Warr (2007), agricultural exports to Indonesia from Thailand are subject to non-tariff barriers (NTBs).

Backward linkage index (BLI_i) is constructed using the latest available input-output table (2000). Data of *CON* are obtained from Kohpaiboon & Ramstetter (2008), using data on large corporations from Business On-Line (2008), supplemented by a large number of related sources, to estimate sales of the largest firms in each industry. The industrial census 1996, the only available census so far, is used to construct *FOR*. All plants with FDI (regardless of the magnitude of the foreign share in capital stock) are considered to be foreign firms for the identification of local firms. This cutting point (i.e. zero per cent) seems to be slightly higher than is widely used by the International Monetary Fund (IMF) and other institutes, such as the Organization for Economic Co-operation and Development (OECD), the US Department of Commence as well as several scholars studying multinational firms (IMF, 1993; Lipsey, 2001), i.e. 10 per cent. However, the choice is dictated by data availability. Information on foreign ownership is reported across a wide range, i.e. zero, less than 50, greater 50 and 100 per cent foreign shares. Both CON_i and FOR_i are classified according to the International Standard of Industrial Classification (ISIC). Since classifications of BLI_i, CON_i and FOR_i are not yet in HS classification, international concordance is used to convert into HS classification. Finally *INT* is the average export value during the period 2000-02, obtained from the United Nations database (UN Comtrade). Note that *INT for* Vietnam is for the period 2003-05. Table 4 provides a statistical summary, as well as a correlation matrix, of all relevant variables in this analysis.

6. Results

The equations are firstly estimated using the ordinary least squares (OLS) method while paying attention to the possible presence of outliers. Due to the nature of cross-sectional data, it is likely that outliers could impact on and mislead the estimated parameters and, therefore, careful treatment of outliers is needed. Cook's Distance[13] is used to identify suspected outliers. To examine the impact of the outliers suspected by Cook's Distance,

both samples with and without are used. Since we do not observe values of $AFTAU_i$ less than zero (the left censoring) and greater than 100 per cent (the right censoring), OLS estimation would be biased and inconsistent. According to the standard practice, Tobit estimator is used. Tobit model is a hybrid model, in which a discrete distribution is combined to investigate why some observations are positive, *y**, while others are not, and then, for those with $y^* \in [0,100]$, a continuous distribution to quantify the relationship. Maximum likelihood estimation is used to obtain Tobit model estimates.

The results are reported in Table 5. All equations pass the overall statistical significant test at the one per cent level. Equations 5.1 and 5.2 are, respectively. OLS estimates including and excluding observations suspected to be outliers by Cook's distance. There are 227 observations suspected as outliers. Comparing estimates of equations 5.1 and 5.2 suggests that the impact of outliers on estimates seems to be limited on the statistical significance of coefficient corresponding to BLI_i. Specifically, the coefficient corresponding to *BLI* is significant at the 10 per cent level only when outliers are excluded. Estimates of the other variables in both equations are virtually the same. Interestingly, nearly half of the suspected outlier samples are from Vietnamese observations. Among these Vietnamese observations, there is no systematic relationship between $t_i - t_i^{FTA}$ and $AFTAU_i$. Even though $t_i - t_i^{FTA}$ equals zero, *AFTAU* in many product lines is very high. One possible explanation is the presence of non-tariff barriers (NTBs), so that observed margin between MFN and preferential tariffs cannot represent FTA tariff privileges. Since NTBs could not be captured in the current study, our preferred sample is without outliers.

Since BLI_i is in the centre of our analysis, a statistical robustness check for its corresponding coefficient is undertaken. The marginal significance of coefficient corresponding to BLI_i found in the sample without outliers could be due to the nature of the BLI_i impact on $AFTAU_i$. That is the positive relationship between BLI_i and $AFTAU_i$ would be observed within a certain range. After BLI_i exceeds a certain level above the levels required by the RoO (40%), its impact vanishes. To examine the non-linear

relationship between BLI_i and $AFTAU_i$, BLI_i is replaced by a zero-one dummy variable which equals zero when *BLI* is lower than its mean and one, otherwise (*BLID).* The OLS estimates using *BLID* are reported in Equation 5.3. The results support the hypothesized non-linear relationship. The coefficient corresponding to *BLID* turns out to be significant at the conventional level, (i.e. five per cent) while coefficients corresponding to other explanatory variables are virtually unchanged. Nevertheless, using a mean value of BLI_i as the cut off point is rather arbitrary so that our preferred choice of backward linkage index is original BLI_i.

Finally, the results are generally not affected when observations relating to Vietnam are excluded (Equation 5.4). The exception is all country-specific dummies turn out to be statistically insignificant. Such a change in estimated coefficients implies that it is likely to observe that $AFTAU_i$ records of Indonesia, Malaysia and the Philippines are higher than those of Vietnam. All in all, our preferred model is the one estimated for the whole sample covering the four countries in which observations suspected by Cook's Distance are excluded and BLI_i is used as a proxy of the degree of RoO restrictiveness (Equation 5.2).

Equation 5.5 derives from estimating results of Equation 5.2 by Tobit estimator in order to guard against biasness and inconsistency as a result of the censored nature of dependent variables. All coefficients are statistically significant at the five per cent level or better with theoretical expected signs. The coefficient corresponding to $t_i - t_i^{FTA}$ is significant at the one per cent mark. The tariff margin does matter for the private sector in deciding whether or not to apply for AFTA tariff concessions. It also implies that applying for such tariff concessions is costly to a certain extent. Otherwise, the positive relationship would not be revealed.

The positive and significant coefficient corresponding to BLI_i indicates that the RoO constraint is binding. All other things being equal, products with greater backward linkages (domestic value added content) tend to register a higher level of *AFTAU*. As

argued in Kohpaiboon (forthcoming), export-oriented industries tend to have a low value of BLI_i. Thus, the list of products eligible for AFTA tariff concessions would not necessarily be in line with Thailand's comparative advantage. This would explain the high concentration of AFTA utilization within certain product categories, and with vehicles in particular.

The coefficients for the three industry-specific factors turn out to be statistically significant at the one per cent level. This would support our hypothesis that the administrative costs in compiling RoO are a fixed amount. The negative and positive coefficients corresponding to *FOR* and *CON* suggest that it is local and conglomerated firms that utilize AFTA privileges, as opposed to foreign firms. This evidence is consistent with the observed trade pattern between Thailand and ASEAN members. Specifically, the increasing importance of ASEAN countries as Thailand's trading partner has been largely driven by parts and components in SITC 7 which are dominated by MNEs, subject to low tariffs and likely to benefit from BOI tariff exemptions. As a result, their response to AFTA tariff concessions tends to be limited. The statistical significance of *CON* also raises the question of the net developmental impact associated with FTA-led liberalization. Because of the nature of FTA in which RoO needs to be in place, AFTA privileges tend to be in favor of large enterprises compared to small and medium enterprises (SMEs).

Another implication from the observed statistical significance of INT_i is that it is mostly the established exporters who benefit from AFTA concessions. In other words, products must be traded substantially before (i.e. in the pre- signing FTAs period) to ensure that FTA export creation is considerable. Our findings cast doubt on the strategy of using FTAs for market access purposes, as is claimed by FTA proponents and policymakers.

7. Conclusions

This paper has examined how the private sector responds to export opportunities induced by the ASEAN Free Trade Area (AFTA), using evidence from Thai manufacturing

during the period 2003-06. The analysis began with examining the trends and patterns in administrative records of AFTA implementation, and then inter-product cross-sectional econometric analysis is undertaken to gain a better understanding AFTA utilization across products. The novel feature of the analysis is that it makes an explicit distinction between actual and preferential trade in which the later is measured by the administrative records of AFTA implementation.

Our findings suggest that exporters do not usually utilize tariff concessions offered in AFTA. The value of exports recorded in the administrated records of AFTA administration in Thailand accounted for less than 20 per cent of total exports from Thailand to ASEAN during the period 2003-06. The low utilization is primarily due to the nature of trade between Thailand and other ASEAN countries, largely driven by the product fragmentation phenomenon, presence of tariff exemption schemes, and the thin tariff margin. Our econometric analysis suggests that the tariff margin is one of the key factors explaining the variation of AFTA utilization across products. Whether the actual impact of AFTA export creation is substantial depends on trade volume in the pre-signing FTA. We find that rules of origin constraints are binding and tend to incur fixed administrative costs to firms applying for tariff concessions. It is predominantly local firms, in particular large local conglomerates, which utilize AFTA tariff concessions, compared to foreign firms.

Three policy inferences can be drawn from this paper. Firstly, the use of actual trade data (based on Customs records) to evaluate the impact of FTA on trade, as has been commonly done in gravity-model based studies, is seriously misleading. The actual trade taking place under FTAs could well be much less than the recorded trade of a given country because there are costs involved in applying for FTA tariff concessions. Secondly, how, rather than how much, trade integration among FTA members takes place matters in determining the expected response of the private sector to tariff concessions offered in FTAs. Thirdly, the low rate of AFTA concessions utilization found in this study is simply due to the nature of trade integration in Southeast Asia that has been driven by the increasing importance of parts and components trade (i.e. international

product fragmentation phenomenon), instead of reflecting any implementation problems that might have arisen. These products have long been either subject to low tariffs or benefited from existing tariff exemptions. While there is a lot of money and effort being spent on negotiating and implementing FTAs, it is very unlikely for FTAs to be effective in promoting intra-regional trade. Rather it is seriously distracting policy makers from the main game of multilateral and unilateral reform, which have played a key role underpinning the prevailing economic success in this region.

Table 1
General and AFTA-preferential tariffs and Distribution of preference Margins of Selected ASEAN Member Countries (%)

	Thailand	Indonesia	Malaysia	Philippines	Vietnam
MFN Tariff					
1995	23.1	19.4*	13.0*	20	12.8
2006	11.1 (5.3)	6.9 (5.3)	7.2 (4.0)	6.2 (3.4)	16.8 (12.4)
Preferential Tariffs in					
2006	1.9 (1.3)	2 (1.6)	2 (1)	2.1 (2.1)	2.5 (2.3)
Distribution of the margin between general and preferential tariffs (% of total tariff lines)					
$\Delta t = 0$	11.0	34.1	59.4	9.5	34.1
$0 < \Delta t \leq 5$	54.9	41.9	12.7	70.7	18.3
$5 < \Delta t \leq 10$	7.2	15.2	6.8	16.9	6.2
$10 < \Delta t \leq 20$	8.5	8.3	15.4	1.7	9.8
$20 < \Delta t \leq 30$	15.0	0.2	4.4	0.7	9.7
$30 < \Delta t$	3.4	0.3	1.2	0.6	21.9
#tariff lines	5,225	5,391	5,222	5,390	5,219

Notes: * data for 1994; The number in parentheses indicate weighted tariff rates calculated using import value in 2005.; General tariff rates are MFN rate for all countries except Thailand for which applied rates are used.

Sources: Data of 1994/95 are from Jongwanich & Kohpaiboon (2007) whereas the others are based on Author's Calculation using official documents reported to the ASEAN Secretariat.

Table 2
Top 10 Items Trade between Thailand and ASEAN-10 during the period 2003-06

2.1 Export

SITC	Description	The Tariff Margin (%)			
		Indonesia	Malaysia	Philippines	Vietnam
776	Thermionic, cold cathode or photocathode valves and tubes; diodes, transistors and similar semiconductor devices; integrated circuits, etc.; parts	0.0	0.0	1.0	1.4
784	Parts and accessories for tractors, motor cars and other motor vehicles, trucks, public-transport vehicles and road motor vehicles n.e.s.	3.3	16.8	5.7	23.5
759	Parts and accessories suitable for use solely or principally with office machines or automatic data processing machines	0.6	0.0	1.0	0.7
713	Internal combustion piston engines and parts thereof, n.e.s.	4.4	2.9	2.4	20.3
752	Automatic data processing machines and units thereof; magnetic or optical readers; machines transcribing coded media and processing such data, n.e.s.	0.2	0.0	0.0	4.1
785	Motorcycles (including mopeds) and cycles, motorized and not motorized; invalid carriages	14.7	7.9	10.6	44.1
772	Electrical apparatus for switching or protecting electrical circuits or for making connections to or in electrical circuits (excluding telephone etc.)	4.1	4.9	1.6	8.6
775	Household type electrical and nonelectrical equipment, n.e.s.	5.9	12.6	4.2	29.0
764	Telecommunications equipment, n.e.s.; and parts, n.e.s., and accessories of apparatus falling within telecommunications, etc.	5.4	3.1	2.3	10.4
778	Electrical machinery and apparatus, n.e.s.	3.6	2.9	2.6	7.4

2.2 Import

SITC	Description	The Tariff Margin (%)	(%) Share of Import applied for BOI Tariff Exemption
776	Thermionic, cold cathode or photocathode valves and tubes; diodes, transistors and similar semiconductor devices; integrated circuits, etc.; parts	2.2	72.9
759	Parts and accessories suitable for use solely or principally with office machines or automatic data processing machines	3.3	70.3
772	Electrical apparatus for switching or protecting electrical circuits or for making connections to or in electrical circuits (excluding telephone etc.)	4.6	62.1
752	Automatic data processing machines and units thereof; magnetic or optical readers; machines transcribing coded media and processing such data, n.e.s.	0.0	16.9
778	Electrical machinery and apparatus, n.e.s.	4.1	47.4
764	Telecommunications equipment, n.e.s.; and parts, n.e.s., and accessories of apparatus falling within telecommunications, etc.	6.3	24.1
784	Parts and accessories for tractors, motor cars and other motor vehicles, trucks, public-transport vehicles and road motor vehicles n.e.s.	34.7	29.6
773	Equipment for distributing electricity, n.e.s.	8.7	68.1
743	Pumps (not for liquids), air or gas compressors and fans; ventilating hoods incorporating a fan; centrifuges; filtering etc. apparatus; parts thereof	5.0	35.5
716	Rotating electric plant and parts thereof, n.e.s.	5.4	35.9

Sources: The tariff margin is based on Author's Calculation using official documents reported to the ASEAN Secretariat whereas trade data are obtained from the UN Comtrade Database.

Table 3
Thailand's Trade under AFTA Tariff Concessions: Value ($ million) and Concession Utilization Rates, 2003-06

	2003	2004	2005	2006
Export				
Value of exports approved under AFTA ($mil)	2,560	4,075	5,146	5,509
Market share (%)				
ASEAN-4 (1+2+3+4)	84.4	84.0	80.5	77.0
1. Indonesia	29.0	32.6	35.3	30.6
2. Malaysia	31.3	28.7	24.7	24.7
3. Philippines	20.0	18.1	16.6	17.8
4. Singapore	4.2	4.7	4.0	3.8
Vietnam	15.4	15.5	19.0	22.4
Other ASEAN countries	0.2	0.5	0.5	0.6
Utilization* (%)				
Overall	15.5	19.2	21.1	20.3
ASEAN-4	15.9	19.7	21.2	20.3
1. Indonesia	32.7	41.3	45.6	50.9
2. Malaysia	20.7	22.0	21.8	20.6
3. Philippines	31.6	40.1	41.4	37.9
4. Singapore	1.8	2.7	2.6	2.5
Vietnam	31.2	33.6	41.3	40.1
Import				
Value of imports approved under AFTA ($mil)	1,459	2,458	3,540	3,077
Import source (%)				
ASEAN-4 (1+2+3+4)	97.1	96.8	96.0	94.7
1. Indonesia	30.4	33.6	33.1	31.9
2. Malaysia	28.8	28.3	27.6	27.1
3. Philippines	23.2	17.8	16.1	15.7
4. Singapore	14.7	17.1	19.2	19.9
Other ASEAN countries	2.9	3.2	4.0	5.3
Utilization* (%)				
Overall	11.7	15.5	16.4	13.2
ASEAN-4	13.1	17.6	18.4	14.9
1. Indonesia	25.3	35.8	37.4	28.8
2. Malaysia	9.3	12.6	12.1	10.0
3. Philippines	25.4	28.3	30.2	23.0
4. Singapore	6.6	10.1	12.7	10.8

Note: * Value of trade approved by the Bureau of Preferential trade, Ministry of Commerce under AFTA as a percentage of total trade.

Sources: Complied using data from the administrative records of the Bureau of Preferential trade, Ministry of Commerce (trade under AFTA concessions), Ministry of Finance (Customs duty) and UN Comtrade Database (actual (total) trade).

Table 4
Statistical Summary and Correlation Matrix

4.1: Summary

	Unit	Mean	SD	Min	Max	CV
$AFTAU_i$	(log) per cent	0.1	0.2	0.0	0.7	169.7
BLI_i	(log) per cent	0.5	0.2	0.1	1.1	32.7
CON_i	(log) per cent	0.2	0.2	0.0	0.5	104.2
FOR_i	(log) per cent	0.5	0.2	0.0	0.7	41.5
$t_i - t_i^{FTA}$	(log) per cent	0.1	0.1	0.0	0.7	141.1
INT_i	(log) $ million	8.2	5.6	-1.1	19.3	67.6
INDO	None	0.3	0.4	0.0	1.0	173.2
MALAY	None	0.3	0.4	0.0	1.0	173.2
PHIL	None	0.3	0.4	0.0	1.0	173.2

Notes: Mean= simple average; SD= standard deviation; Min= minimum; Max = maximum and CV= coefficient of variation (SD/Mean*100). All variables in 'per cent' are converted into logarithmic form as ln (1+x/100) where x is the variable
Sources: Author's computations are based on data sources described in the text.

4.2 Correlation Matrix

	$AFTAU_i$	BLI_i	CON_i	FOR_i	$t_i - t_i^{FTA}$	INT_i	*INDO*	*MALAY*
BLI_i	0.08	1						
CON_i	0.10	0.22	1					
FOR_i	-0.05	-0.02	-0.15	1				
$t_i - t_i^{FTA}$	0.26	0.24	0.11	-0.03	1			
INT_i	0.40	-0.02	-0.05	0.13	0.11	1		
INDO	-0.001	0.002	0.007	0.007	-0.09	-0.08	1	
MALAY	0.03	-0.03	-0.01	0.002	-0.08	0.10	-0.33	1
PHIL	-0.05	0.01	0.005	0.001	-0.17	-0.06	-0.34	-0.33

Sources: Author's computations are based on data sources described in the text.

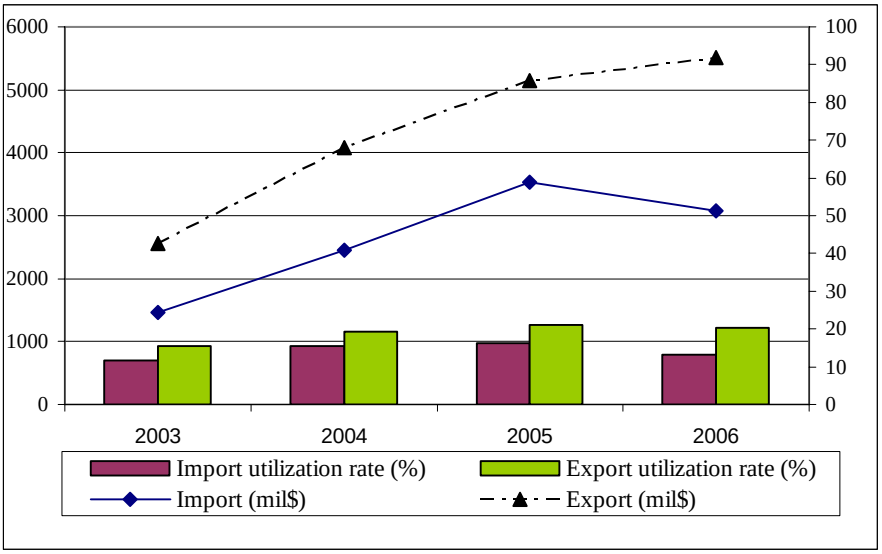
Table 5
Determinants of AFTA Utilization (AFTAU =Dependent Variable)

	OLS				TOBIT
	5.1	5.2	5.3	5.4	5.5
Intercept	-0.05	-0.07	-0.06	-0.03	-0.58
	(-3.22)***	(-6.7)***	(-5.89)***	(-2.49)**	(-19.18)***
$t_i - t_i^{FTA}$	0.59	0.64	0.64	1.07	1.20
	(11.31)***	(14.66)***	(16.64)***	(15.72)***	(16.83)***
BLI	0.02	0.03	0.01	0.03	0.11
	(0.94)	(1.58)*	(1.85)**	(1.44)*	(2.91)***
CON_i	0.11	0.08	0.08	0.08	0.11
	(4.96)***	(4.59)***	(4.56)***	(4.15)***	(3.45)***
FOR_i	-0.10	-0.07	-0.07	-0.09	-0.15
	(-5.65)***	(-5.48)***	(-5.13)***	(-5.73)***	(-5.21)***
INT_i	0.02	0.01	0.01	0.01	0.04
	(28)***	(29.64)***	(26.32)***	(22.48)***	(30.52)***
INDO	0.05	0.05	0.05	0.01	0.14
	(4.63)***	(6.11)***	(5.94)***	(0.69)	(8.64)***
MALAY	0.03	0.04	0.04	0.00	0.12
	(2.88)***	(4.49)***	(4.47)***	(-0.39)	(7.26)***
PHIL	0.03	0.04	0.04		0.12
	(3.26)***	(5.05)***	(4.67)***		(7.15)***
F-statistics	132.68***	148.42***	148.41***	134.44***	1637.35
R^2	0.23	0.28	0.28	0.29	0.56
# observations	3313	3086	3086	2328	3086

Notes: Numbers in parentheses are *t*-statistics and ***, **, * indicate the level of statistical significance at 1%, 5%, and 10%, respectively. *F*-statistics in the case of Tobit estimation model is $LR \sim \chi^2(8)$.

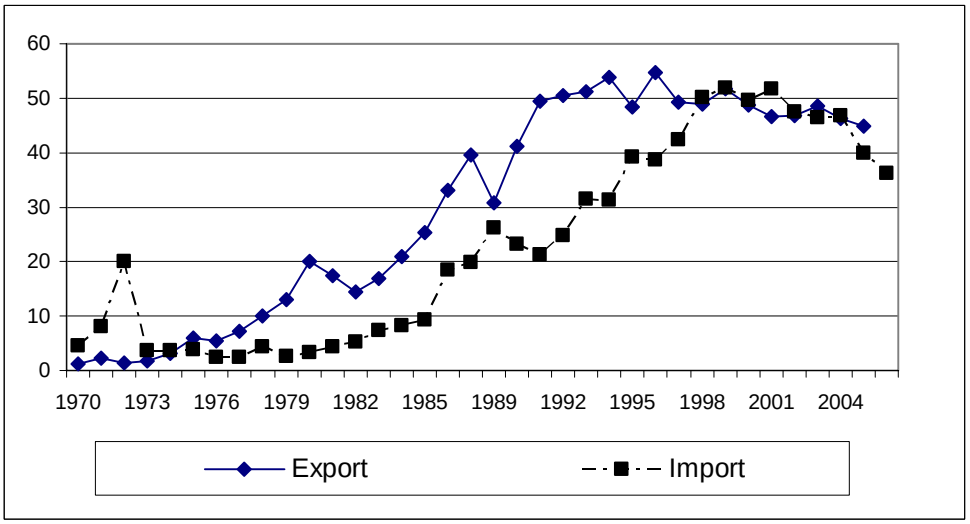
Sources: Author's estimates are based on data series discussed in the text.

Figure 1
Official Record of AFTA Implementation of Thailand, 2003-06



Sources: Complied using data from the administrative records of the Bureau of Preferential trade, Ministry of Commerce (trade under AFTA concessions), Ministry of Finance (Customs duty) and UN Comtrade Database (actual total).

Figure 2
The share of machinery and equipment (SITC 7) in Thailand's Trade with ASEAN-10, (1970-2006)



Sources: Trade data are obtained from the UN Comtrade Database.

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