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Rebalancing Exports through Expansions in Intra-ASEAN Trade? Insights from Gravity Panel Estimates

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This paper examines the impact of common economic factors on intra-ASEAN bilateral exports through estimations of panel data using a gravity model. In particular, the paper compares the determinants of two-way bilateral exports within the pioneer ASEAN member economies from that of the pioneer-newer ASEAN economies, to provide insights on the specific channels and trading relationships relevant for boosting intra-regional exports. The gravity estimates imply the importance of the overall size effects and similarities in size between the pioneer-newer ASEAN partnerships for export expansions, and also for trade in agriculture and manufactures. These channels however do not bolster exports amongst the pioneer ASEAN economies. The empirical findings therefore add weight to the observation that strategic partnerships are necessary within the region to bolster intra-regional exports through the level and relative size effects. We therefore posit that any rebalancing strategy to increase intra-regional exports should move beyond the focus on the pioneer ASEAN members per se, to foment greater trade cooperation between the pioneer and newer ASEAN economies.

1. Introduction

Of the total USD2.1 trillion total trade in 2010, only 25 per cent of it was represented by trade amongst ASEAN (Association of Southeast Asian Nations) members (The Star, 17 October 2011). The extent of intra-ASEAN trade pales in comparison with the levels of intra-regional trade in the North American Free Trade Area (NAFTA) and the

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European Union (EU) at approximately 50 per cent and 60 per cent respectively. The level of intra-ASEAN trade is obviously unsatisfactory, especially if the grouping wants to evolve into an economic community[4] (Aggarwal and Chow, 2010). With the current low level of intra-regional trade, it also seems not conceivable for ASEAN to rebalance its export strategy[5] towards a regional focus to cushion export contractions, following the slowdown in external demand.

It is widely acknowledged that intra-ASEAN trade has somewhat reached a plateau as it has remained fairly constant since the 1997 financial crisis (see also Thornton and Goglio, 2002; Sally and Sen, 2005; Ravenhill, 2008; Aggarwal and Chow, 2010; Bhattarchayay, 2010; OECD, 2010), despite the formation of the ASEAN Free Trade Area (AFTA)[6] in 1992 (Sharma and Chua, 2000) and the subsequent dismantling of tariffs. Various reasons have been offered for the limited intra-regional trade, such as the small domestic market, few economic complementarities between member economies and the global orientation in trade (Sharma and Chua, 2000; Plummer and Jones, 2006; Angresano, 2006; Plummer, 2009). This calls into question the viability of expanding intra-ASEAN exports to compensate for the weakening global demand, as policymakers recently underscore the importance of strengthening intra-regional trade in light of the global financial crisis. This paper therefore attempts to answer the following question: In what way can intra-regional exports be bolstered? More specifically, through what channels and which strategic partnerships can there be expansions in intra-ASEAN exports? This paper can be differentiated from previous studies in that the focus has largely been on the ASEAN5 setting and the implications of AFTA on ASEAN trade flows (Plummer, 1997; Sharma and Chua, 2000; Elliott and Ikemoto, 2004; Sudsawasd and Mongsawad, 2007; Jayanthakumaran and Verma, 2008; Nguyen, 2009; Siah *et al.*, 2009). This paper, whilst focusing on ASEAN, further

4 ASEAN established the ASEAN Economic Community (AEC) with the 2003 Bali Concord II to create a single market and production base for a free movement of goods, services, investment and skilled labour by the year 2020 (now to fast-track the establishment of the AEC by 2015).

5 Export rebalancing policy was proposed to deter external risks (Tantisantiwong, 2010) following the global financial crisis, as demand from advanced economies for ASEAN exports, particularly from Singapore, Malaysia, Thailand and Cambodia, decelerated. It should be noted here that the rebalancing strategy does not refer to just increasing intra-regional trade, but to also promote trade diversification through both products and markets. Only the former is given due attention in this paper.

6 The trade creating effects of AFTA however remains mixed at best. For example, Elliott and Ikemoto (2004) and Nguyen (2009) find significant trade creation among members following the formation of AFTA.

distinguishes intra-ASEAN trade into two-way export flows within the pioneer/ founder economies (herein ASEAN5, comprising Malaysia, Singapore, Thailand, the Philippines and Indonesia) from that of pioneer-newer ASEAN members (herein ASEAN*, where the newer[7] member economies refer to Brunei, Cambodia, Laos, Myanmar and Vietnam). It is worth mentioning here that ASEAN* does not include two-way trade between the newer economies.

In view of the above, this paper takes stock of the regional bias and trade structure of the various trading relationships within ASEAN5 and ASEAN* and subsequently identifies the main determinants of export flows within both groups. Guided by new trade theories (NTT), the paper employs an extended gravity model to compare the sources of bilateral trade flows for ASEAN5 and ASEAN* utilizing recent data for the period 1990-2010. The findings of the paper will forward our understanding on the reality of enhancing intra-regional exports.

2. Regional Bias and Trade Structure

To obtain a more useful measure of trade concentration in the region, intra-regional trade shares (export, imports and total trade) as a proportion of its world trade is calculated for ASEAN and individual ASEAN economies in Tables 1a and 1b respectively.

The regional trade bias for ASEAN has increased from 19 per cent to 25 per cent between 1990 and 2010 (Table 1a). Clearly, ASEAN accounts for its lion's share of its trade with the outside world. The regional bias is found to be marginally higher from the export perspective vis-à-vis the import side. The same can be said for both the sub-samples of ASEAN5 and ASEAN*. From the export perspective, the regional bias for ASEAN is higher for trade in manufactures relative to agriculture. Similar trends prevail when the regional bias is considered for the ASEAN5. This is however not the case for ASEAN*, as the regional bias is higher for agriculture products relative to manufactures, from both the export and import perspectives.

From Table 1a, it is also noted that trade between the pioneer ASEAN economies (ASEAN5) form the bulk of intra-regional trade flows (see

7 Brunei joined the ASEAN in 1984, whilst Cambodia, Laos, Myanmar and Vietnam (CLMV) made ASEAN10 in the 1990s.

also Ravenhill, 2008). Though the bilateral pioneer-newer ASEAN economies (ASEAN*) partnerships are relatively weak, their contribution to intra-ASEAN trade has grown over the years, particularly from the export perspective for trade in agricultural products. The low and increasing levels of intra-regional trade between the pioneer and newer ASEAN may well reflect unexplored trade opportunities.

Further, Table 1b examines the regional bias of individual ASEAN economies. From Table 1b, we can infer that the importance assigned by the pioneer members to ASEAN as an export market does not vary much. Approximately one-fourth of the ASEAN5 economies' trade is with the region, based on the 2000 statistics. Singapore, more specifically, records the highest regional export bias given that it engages in intra-regional entreport trade (Plummer, 2009) and its role as the regional center of cross-border production networks (Athukorala, 2008). Conversely, the asymmetry in intra-regional trade is much sharper between the newer member economies. Intra-regional bias is supposedly highest for Laos (not shown in Table 1b due to limited data) and Myanmar, whilst Cambodia and Vietnam remain far more integrated with the world economy than the former.

Apart from the regional bias, the trade structure of the bilateral ASEAN flows is also examined. Tables 2a and 2b report the calculated Grubel-Lloyd (GL, 1975) index[8] for the various trading relationships within ASEAN5 and ASEAN* to capture the extent of intra-industry trade (IIT)[9]. It is widely known that trade flows within ASEAN5 are largely dominated by IIT (more specifically parts and components, see Athukorala, 2008; Athukorala and Hill, 2010; Jongwanich, 2010), particularly for manufactures within the electrical and electronics (E&E) sub-sector. In fact, the E&E industry, which has established a dense production network, has become a leading force of economic integration in the region (Kuroiwa, 2009). This leads to strong spatial linkages between the pioneer economies, particularly between Malaysia-

8 The GL indices at the 5-digit SITC level are aggregated across the agricultural (SITC 0-4) and manufacturing (SITC 5-8) sectors, taking into account their different weights. The weighted average GL index is given as:
$AGL_i = [\sum(X_i + M_i) - \sum|X_i-M_i|] / \sum(X_i + Mi)$ where i = particular industry at the 5-digit level.

9 The case whereby a country's exports and imports share a single industry classification dominates. In the case of ASEAN, the high IIT levels do not reflect product differentiation, but production sharing within the same industry.

Singapore, Malaysia-Thailand and Singapore-Thailand. Comparatively, trade in agriculture is largely of the inter-industry (IT) type.

More recently, regional production networks have begun to expand to the newer member economies, particularly Vietnam (see also Hew *et al.*, 2009) This explains the higher GL indices between the pioneer ASEAN economies and Vietnam relative to that between the former and other newer member economies (see Table 2b). However, the GL indices for the bilateral trading relationships between the pioneer and newer economies (Table 2b) remain far much lower than that for pioneer-pioneer trade (Table 2a).

The differences in the trade structure between Table 2a (ASEAN5) and Table 2b (ASEAN*) suggest that IIT dominates in trade of the former whilst the latter bilateral country-pairs are engaged more in trade of the IT type. It seems that production networks are regionalized only within the pioneer economies in comparison with newer economies. Thus the two different sub-samples, ASEAN5 and ASEAN*, appear to be somewhat stratified according to their regional bias and trade structure. The differences in the trading patterns between both samples further justify the empirical investigations of this paper.

3. Methodology and Data

3.1 Model Specification and Theoretical Underpinnings

This paper employs the extended gravity model, developed by Chengang *et al.* (2010) based on Egger (2000), Baltagi *et al.* (2003) and Peridy (2006), to investigate the influence of common economic factors on intra-ASEAN trade. Using a panel data[10] framework, the equation is specified as follows:

$$\ln X_{ijt} = \beta_1 \ln GDPT_{ijt} + \beta_2 SIMGDP_{ijt} + \beta_3 \ln GD_{ij} + \beta_4 \ln FDST_{ijt} + \beta_5 SIMFDS_{ijt} + \beta_6 RLFAC_{ijt} + \zeta_t + \varepsilon_{ijt} \quad (1)$$

10 Other studies that have applied the panel framework in the estimation of a gravity equation include Egger and Pfaffermayr (2003), Rose (2004) and Chengang *et al.* (2010).

$$\ln TRADE_{ijt} = \beta_1 \ln GDPT_{ijt} + \beta_2 SIMGDP_{ijt} + \beta_3 \ln GD_{ij} + \beta_4 \ln FDST_{ijt} + \beta_5 SIMFDS_{ijt} + \beta_6 RLFAC_{ijt} + \zeta_t + \varepsilon_{ijt} \quad (2)$$

where X_{ijt} is country *i*'s (reporter) exports to country *j* (partner) in year *t*. X_{ijt} is used interchangeable with $TRADE_{ijt}$, which represents total trade (summation of exports and imports) of country *i* to country *j*. The other variables are as defined below.

GDPT = total GDP of countries *i* and *j*

SIMGDP = similarity in the levels of GDP in *i* and *j*

GD = geographical distance between *i* and *j*

FDST = total inward FDI stock of *i* and *j*

SIMFDS = similarity in inward FDI stocks in *i* and *j*
RLFAC = relative factor endowments in *i* and *j*

In equations (1) and (2), β's represent the coefficient estimates, ζ_t is time effects and ε_{ijt} is a white-noise disturbance term.

The above equation follows from a standard gravity model comprising gross domestic product (*GDP)* and geographical distance (*GD*) between countries, augmented with the stocks of inward foreign direct investment (*FDS*) and relative factor endowments (*RLFAC*) on the basis that the latter two variables are closely related to a country's trade capabilities and transaction costs respectively. The following explains the theories that underlie the selection of the explanatory variables in equations (1) and (2), beginning with the core variables of the gravity model.

The level of GDP of both reporter and partner countries are supposed to positively affect their trade. Instead of using the levels of GDP of both countries independently, the total GDP of both partners, *GDPT*, is included in the estimations to jointly capture economies of scale or the size effect (and production capacity). The higher the *GDPT*, the larger

the trade flows, given that a greater division of labour and specialization becomes feasible under a larger scale of operation.

However, Baltagi *et al.* (2003) and Chengang *et al.* (2010) argue that the level of GDP alone may not be sufficient to explain trade as the relative size of the two trading partners GDPs are of no less importance. From a theoretical perspective, similarity in the level of GDP (*SIMGDP*) is most likely to increase trade either through the expansions in trade in manufactures or the increase in scope for product diversity. In short, the more similar the two countries are in terms of GDP, the higher the share of IIT.

The next core argument of the gravity model is the *GD* variable. *GD* remains important for considerations of transport costs (Egger, 2000), transaction costs (Bergstrand, 1985; Edmonds *et al*., 2008) and timeliness in delivery (see also Rojid, 2006), and is included in our model. . Accordingly, the variable GD is expected to carry a negative sign, that is, $\beta_3 < 0$ (Tinbergen, 1962; Poyhonen, 1963).

As explained by Chengang *et al.* (2010) and others, foreign direct investment (FDI) contributes to intra-firm trade through global production networks and the increase in product variety in the host economy. This in turn increases the volume of trade, mainly through IIT. However, if FDI and trade are substitutes, for example if FDI is mainly channeled into domestic production of the host economy, then, it does not necessarily contribute to expansions in exports. As such, the relationship between *FDST* and international trade remains inconclusive and has to be investigated empirically.

The distribution of *FDS* amongst trade partners is also considered important for international trade. If the size of *FDS* is similar between trade partners, one may expect similar volumes and varieties of bilateral exports from the partner countries. Following which, the import capabilities of both partner countries are also likely to be similar, leading to expansions in bilateral trade. Conversely, if the size of *FDS* is uneven between trade partners, the country with a smaller stock, offers less export capabilities and likewise smaller import capabilities, resulting in lower expansions in bilateral trade. Based on this reasoning, one may predict a positive relationship is envisaged between *SIMFDS* and exports.

Differences in factor endowments or factor intensity (capital-labour ratio or K/L) do matter for international trade (see Bergstrand, 1990; Frankel *et al.,* 1995; Baltagi *et al.,* 2003; Debaere, 2003; Ghosh and Yamarik, 2005; Chan-Hyun, 2005; Baxter and Kouparitsas, 2006; Cieslik, 2009). Traditional neoclassical trade theories suggest that comparative advantages based on differences in factor endowments explain basically IT. Alternatively, NTT based on economies of scale and product differentiation attribute similarities in factor endowments to trade expansions through IIT. Thus, the differences and similarities of factor endowments (apart from *SIMGDP*) are closely linked to the structure of trade. If the structure of trade is IT-based, differences in relative factor endowments will most likely facilitate trade expansion vis-à-vis similarities in factor endowments. In this respect, the expected sign for β_6 will be positive (negative) if IT (IIT) dominates. Nevertheless, caution should be drawn in interpreting the signs of the β_6 coefficient as vertical IIT (VIIT) characterizes much of the nature of ASEAN intra-regional trade and differences in factor endowments (or comparative advantage) are still crucial in determining VIIT (Chan-Hyun, 2005).

3.2 Data Sources and Variable Construction

Our dataset includes two-way bilateral intra-ASEAN[11] (Singapore, Thailand, Philippines, Indonesia, Brunei, Cambodia, Laos, Myanmar and Vietnam) trade flows. The data span the period 1990-2010 (annual).

The primary data on export (*X*) and total trade (*TRADE*) flows based on the Harmonized System (HS) nomenclature is derived from the UN COMTRADE database. The data on *GDP*, labour force (L) and gross fixed capital formation (GFCF)[12] are sourced from the World Bank Development Indicators and Global Development Finance (online World dataBANK). The data on *FDS* is obtained from the online database of the United Nations Conference on Trade and Development (UNCTAD), which is UNCTADstat. Data for *GD* on the basis of the average distance

11 The bilateral trade pairs that have been excluded in the empirical estimations include the following due to lack of trade data: Philippines-Laos and trade between Laos (reporter) with the other 5 ASEAN partner countries.

12 Using the data on GFCF, capital stock (K) is estimated as follows (Miller and Upadhyay, 2000):
$K_0 = GFCF_0 / [\lambda gd + (1 - \lambda)gw + \delta]$ where the initial or base year is 1970; gd is the average growth rate of the GDP series for the country in question for the period 1990-2010; gw is the estimated world growth rate at 2.95 per cent for the period 1990-2010; $\lambda = 0.25$, is a measure of mean reversion in growth rates and $\delta = 0.05$, is the assumed rate of depreciation. The estimated capital stock is $K_t = GFCF_t + (1 - \delta)K_{t-1}$

between the capitals for country-pairs are extracted from the CEPII database. The definition and measurement of the key variables used in regression analysis are summarized in Appendix Table 1.

The analysis is first conducted for the full sample of ASEAN and subsequently, for ASEAN5 and ASEAN*. The empirical estimations constitute a three-dimensional balanced panel of 2,730 observations (65 country-pairs x 2 product groups x 21 years; the cross-section dimension relates to the country-pair-product group) for ASEAN, and 840 observations (20 country-pairs x 2 product groups x 21 years) and 1,890 observations (45 country-pairs x 2 product groups x 21 years) for the sub-samples of ASEAN5 and ASEAN* respectively. For all three groups, ASEAN, ASEAN5 and ASEAN*, the analysis further distinguishes between the agriculture and industrial sectors respectively. The broad product groups[13] in the cross-sectional dimension refer to the agriculture (HS01-HS24) and industrial/manufacturing (HS25-HS97) sectors.

4. Empirical Findings

Table 3 presents the results of the Random Effects (RE) models. The Breusch-Pagan (1980) Lagrange Multiplier (LM) test is employed to determine whether RE Generalized Least Squares (GLS) is appropriate and the simple pooling can be rejected. The LM statistics are overwhelmingly significant and support the appropriateness of the panel GLS model for all specifications.

The RE estimator is chosen for the following reasons, despite the fact that the Fixed Effects (FE) estimator is much more common in gravity models than the RE estimator (see Egger, 2000). The RE estimator has the advantage of not requiring the exclusion of variables that are time invariant. In this case, distance (*GD*) is invariant across time periods, and this variable is of considerable interest to this study. Furthermore, all of the variables exhibit more variation in the data across country-pair-product group (between variation) than over time (within variation). This is not surprising given the large number of cross-section entities (based on country-pair-product groups) used for the estimations, which

13 This level of aggregation would balance the issue of disaggregated versus aggregated analysis, in addition to reflecting the agriculture and industry based products. This level of aggregation also reduces the problem of a standard sample selection bias, as many more trade relationships on a product-specific level at HS2 are nonexistent. Instead at this level of aggregation, there are no observations with zero trade flows.

are believed to have some influence on bilateral exports. As such, a FE may not work well for data with minimal within variation or for variables that change slowly over time.

Since FDI and new growth theories predict that *GDPT* and *FDST* are likely to be endogenous, the Hausman and Taylor's estimator (henceforth HT, 1981) technique is also employed (see also Egger, 2000; Nguyen, 2009). Qualitatively, the HT results in Table 3 are similar to the RE estimates. Therefore the following discussion will focus mainly on the HT estimates. We have estimated the results in three contexts. First, we estimate the gravity model [equation (1)] for intra-ASEAN trade as the benchmark context. Next, we estimate the same specification for the sub-samples, ASEAN5 and ASEAN* respectively. Overall, the model passes the standard diagnostic tests and most of the regressors are found to be highly significant, indicating that the gravity model is appropriate and useful in explaining intra-ASEAN trade flows.

Focusing on the results in Table 3, we found that the combined total size of trading partners positively affects the volume of export activity only in the case of ASEAN*. (See Siah *et al.,* 2009, for negative estimates of size on intra-ASEAN5 trade). The estimated coefficient, β_1, in the full sample and the ASEAN* goes beyond the normal range of 0.75-0.95, derived in various studies (Chan-Hyun, 2005). The coefficient of the product of GDPs is undeniably high, indicating that an increased size has a more than proportional effect on exports. One plausible reason why the increase in bilateral trade volume is more than proportionate to the increase in GDP is the smaller home-bias effect. The ASEAN local distribution network is widely acknowledged as being limited, given the small market base for final goods. From this, we can conjecture that pioneer-newer ASEAN trade flows comprise mostly that of quantity-based final products, as the newer member economies remain less integrated in the regional production networks, which are sensitive to overall market size.

Though FDI is an important priority in the ASEAN region, the coefficients for *FDST* are found to be generally negative and insignificant. This implies that the sum of FDI stocks between ASEAN partner countries do not promote bilateral exports, as foreign capital (efficiency-seeking or "network-forming-type FDI", Kimura, 2008) has

been a key factor in driving extra-regional (through intermediate trade) relative to intra-regional exports. In fact, intra-regional intermediate remained almost unchanged relative to intermediate trade with the other East Asian economies (OECD, 2010). Plummer (2009) further argues that to the extent that FDI is involved in the fragmented production chain across countries in the region, a successful policy of increasing FDI inflows could lead to a decrease in intra-regional trade shares, if ASEAN value-added in the production chain is low. We further note that the magnitude of the coefficients for *FDST* are larger for ASEAN* relative to ASEAN5. A plausible explanation for this is that there could be some substitution effects taking place in the newer member economies, since the limited foreign capital in these economies are more likely be channeled into domestic production. One example of this is Laos, where extractive industries, such as gold and copper, have been attractive to foreign investors. Another case is Vietnam in the initial stages of liberalization (prior to the late 1990s), where FDI was heavily concentrated in domestic-market-oriented-capital-intensive industries such as chemicals and automotives. Interestingly, there is also no significant relationship between *SIMFDS* and exports. Though the pioneer member economies, in particular, have already accumulated an almost equal abundance of capital[14], this again does not favour intra-regional trade. The results of *FDST* and *SIMFDT* clearly show that foreign capital has no bias towards the regional market.

Geographical distance is found to be a resistance factor for intra-ASEAN trade, where the absolute estimate on distance is larger for ASEAN* than the one in the ASEAN5 context. A possible reason is the weak trade connectivity and trade facilitation in the newer member economies (particularly Cambodia, Laos and Myanmar). From this point, we can infer that distance becomes a more important impediment to two-way export flows between the pioneer and newer member economies than between the pioneer economies.

More importantly, is the trade impact of *SIMGDP* and *RLFAC*, which explains the underlying trade structure. We find that if a pioneer

14 For example, Singapore, Malaysia, Thailand and Indonesia are amongst the eight largest developing country recipients of FDI (Athukorala and Hill, 2010; see also Plummer 2009). CLMV only accounts for about 9 per cent of total FDI inflows to ASEAN. Singapore also dominates as a source of intra-regional FDI (accounting for one-third of intra-ASEAN FDI), which is largely concentrated in Malaysia and Thailand (Plummer, 2009).

ASEAN country is similar in size with another pioneer trading partner, there is a decline in exports, whilst the opposite holds when the trading partner is a newer counterpart. The significant negative impact of *RLFAC* on ASEAN* exports imply that export volumes are smaller the more dissimilar the pioneer-newer economies are in terms of *RLFAC*. Contrary to expectations, the results suggest that IIT dominates in pioneer-newer ASEAN trade. At this juncture, we will not draw any strong conclusions from this result based on total exports.

The estimations are conducted using trade as a dependent variable [equation (2)], instead of exports (see panel two of Table 3). The results are found to be remarkably robust in terms of the signs and significance of the coefficient estimates. More importantly, the estimates are further conducted by distinguishing between the agriculture and manufacturing sectors respectively. It is important to distinguish both sectors for the following reasons: IIT dominates trade in manufactures; and the newer economies are largely agrarian based (though there is a structural shift in some economies towards manufacturing). The panel gravity estimates for agriculture and manufactures are presented in Tables 4 and 5 respectively.

Again, size effects and similarities in GDP are clearly found to be positive and significant for export expansions in manufactures and agriculture for ASEAN* trading relationships only. Conversely, similarities in GDP incur a negative impact on intra-ASEAN5 exports in manufactures.

The significant negative results for total inward FDI stock as found for total export flows in Table 3, remain for exports in manufactures and agriculture for ASEAN*, and for exports in agriculture for ASEAN5. The reason why *FDST* does not significantly influence exports of manufactures for ASEAN5 is reflective of the fact that manufactures in the pioneer economies remain the single most important sector for most major sources of FDI. Similar sizes of FDS have however decreased exports of agriculture products between pioneer ASEAN economies, but do not matter for the ASEAN* exports.

Surprisingly though, *RLFAC* has a negative impact on exports of agriculture in ASEAN*, consistent with the findings on total trade in Table 3. The positive sign on the coefficient estimates of *RLFAC* for

ASEAN5 should not be misinterpreted to reflect IT type of trade, but is probably best explained by the VIIT type of trade based on comparative advantages. Finally, distance is found to be a deterrent for exports in manufactures in ASEAN* and exports of agriculture in ASEAN5.

Peculiar to the pioneer-newer trading relationships, the gravity estimates clearly imply the importance of the size effect (see also Sharma and Chua, 2000; Siah *et al.,* 2009; Nguyen, 2009), similarities in GDP and similarities in relative factor endowments (mainly for agriculture products) as drivers of export flows between pioneer and newer ASEAN economies.

5. Binding Trade between Pioneer and Newer ASEAN Economies

Many challenges prevail in binding trade between the ASEAN member economies, specifically between the pioneer and newer members. The following briefly elucidates some of the major issues in fomenting trade cooperation.

Since market size and similarities in GDP are found to be significant for bolstering exports between the pioneer and newer ASEAN economies based on the empirical findings, it becomes even more imperative to enlarge regional markets and address the development divide or economic asymmetries between both groups. What remains baffling is that individual members persist in moving forward on their own by negotiating nearly 60 agreements, with Singapore taking the lead (Dent, 2006; Sudsawasd and Mongsawad, 2007; Aggarwal and Chow, 2010; OECD, 2010). This has clearly undermined or rather shifted the trade integration efforts away from the partnerships between the pioneer and newer member economies (see also Sally and Sen, 2005). Though strategic partnerships outside the region are important to intensify ASEAN's trade networks, strategic partnerships within the region should likewise be intensified and not be compromised with the pursuit of the former. In this context, the pioneer member states should make substantial contributions to addressing the development divide within ASEAN.

Physical connectivity is also critical to the wider objective of reducing the development gap between the pioneer and newer members for rebalancing ASEAN growth towards increased intra-regional trade and

regional demand (Bhattacharyay, 2010). Improving logistics mainly through land transport, can enlarge regional markets and establish new regional supply chains by allowing firms to move further inland in response to congestion along coastal areas. Despite the various regional initiatives[15] for infrastructural development, these initiatives are met with challenges that take several forms, such as geographical diversity, differing technical capacities, asymmetric regional distribution of projects costs and benefits, weak legal and regulatory environment and the lack of effective governance and coordination. Therefore, transport infrastructure still remains less developed in Cambodia, Laos and Myanmar relative to the pioneer economies (OECD, 2010). For example, Laos, as a land-locked economy, is most costly in trading across borders.

In the context of pioneer-new ASEAN trade, intensification of trade networks also depend on the dismantling of non-tariff barriers (NTBs)[16] (see also Ravenhill, 2008) particularly in the priority goods sectors, such as the sanitary and phytosanitary measures for agro-based products and fisheries, safety and other technical measures for rubber-based products and security and environmental measures for wood-based products. Based on the OECD (2010) report, it is estimated that NTMs could be binding constraints to the expansion of intra-regional trade as they could raise import prices significantly.

Finally, there should be a political willingness within the various stakeholders, governments and businesses, to drive intra-regional exports. Enhancing regional connectivity, particularly physical connectivity, requires strong commitment and partnerships among the ASEAN governments to give due attention to ASEAN-level initiatives. Further, businesses have also a critical role to play, as it is business that must drive economic integration. At present, there is little business pressure to promote intra-regional trade (Ravenhill, 2008) and intra-regional investment. This is also eluded too in the empirical findings where the total FDI stock in the ASEAN partner countries does not

15 Infrastructure development in ASEAN is currently being pursued through sub-regional infrastructure cooperation programmes, namely the Greater Mekong Sub-Region (GMS), the Brunei-Indonesia-Malaysia-Philippine East Asia Growth Area (BIMP-EAGA) and the Indonesia-Malaysia-Thailand Growth Triangle 9IMT-GT), and some long-term cross-border flagship projects in energy and transport.

16 Under the AEC, 5 ASEAN countries (Malaysia, Singapore, Thailand, Indonesia and Brunei) will eliminate NTBs by 2010, the Philippines by 2012, and 4 ASEAN countries (Cambodia, Laos, Myanmar and Vietnam) by 2015 (by 2018 for certain sensitive items).

appear to generate exports between the ASEAN member economies, mainly because of the low intra-regional FDI flows of about 14 per cent of the total (Plummer, 2009). The primary concern of subsidiaries of foreign corporations is with the extra-ASEAN dimensions of trade. It is acknowledged that "ASEAN as an economic bloc is still not in the minds of many CEOs," despite that there is still much potential to be tapped (The Edge Malaysia, 24 October 2011). The recently launched ASEAN Business Club (ABC), helmed by an advisory council comprising 10 representatives from ASEAN5, is seen as promising platform for business leaders to network, collaborate and play a leading role in the process of ASEAN economic integration.

6. Concluding Remarks

The empirical results indicate that the gravity model is appropriate in explaining intra-ASEAN trade flows. Overall size effects and similarities in size and similarities in factor endowments (i.e. similarities in preferences) are all found to have a significant favourable influence on two-way flows for pioneer-newer ASEAN exports. Interestingly, overall size effects and similarities in size are found to be export enhancing only in the case of pioneer-newer ASEAN partnerships, and not for pioneer-pioneer trade. It can be argued that the newer member States are small (from and economic perspective) and access to larger markets with the pioneer economies is important to reap the potentials from economies of scale relative to the pioneer-pioneer partnerships. The empirical findings therefore add weight to the observation that strategic partnerships are necessary within the region to bolster intra-regional exports through the level and relative size effects.

This paper though does not argue for an export rebalancing strategy through greater regional integration (i.e. we are clearly not in favour of a regionally closed system), instead it emphasizes that greater intra-regional trade is at best plausible if the regional scope of ASEAN trade integration is broadened. In short, trading relationships in ASEAN can no longer be focused on or dominated by the ASEAN5, but instead should be more inclusive to foment deeper trade cooperation between the pioneer and newer member economies. New economic opportunities based on complementarity trade may emerge if such patterns of bilateral trade between strategic trading partnerships, namely between pioneer and newer member economies, evolve consistently with their changing

comparative advantages. For example, regional supply chains can be established by combining rubber plantation in the newer ASEAN member countries (Cambodia, Laos, Myanmar and Vietnam, CLMV) with the promotion of natural rubber products in the pioneer economies. Likewise, the wood-based products supply network can be established regionally through forest plantation, wood processing and furniture manufacturing. Alternatively, the newer economies can plug into the existing production networks in neighbouring countries, for example Laos-Malaysia and Myanmar-Thailand (Kuroiwa, 2009). The pioneer ASEAN member economies should assume the role of a "core" and deploy the existing vertical production networks to the "periphery" of the newer economies.

In this context, efforts should be strengthened to close the developmental divide and reduce transaction costs to enlarge markets and facilitate trade between the pioneer and newer member economies. This final recommendation, which is the strengthening of supply-side factors, may not be different from those of others; nonetheless, it is one of the policy recommendations that should be given further emphasis.

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Appendix Table 1: Definition and Measurement of Variables

Variable	Definition	Measurement
X	Real exports	The *X* for agricultural and manufactures, expressed in current USD, is deflated by the export price index for agricultural and manufactures respectively, with 2000 as the base year.
TRADE	Total real trade	$TRADE_{ij} = X_{ij} + M_{ij}$ where *M* = imports The *M*, expressed in current USD, is deflated by the import price index, with 2000 as the base year.
GDPT	Total real gross domestic product (GDP)	$GDPT_{ij} = GDP_i + GDP_j$ The *GDP*, expressed in current USD, is deflated by the *GDP* deflator with 2000 as the base year.
SIMGDP	Similarity in the levels of GDP or relative size of trade partners	$SIMGDP_{ij} = 1 - \frac{GDP_i^2}{(GDP_i + GDP_j)^2} - \frac{GDP_j^2}{(GDP_i + GDP_j)^2}$ where $0 \leq SIMGDP_{ij} \leq 0.5$ If $SIMGDP_{ij} = 0$ (absolute divergence in size) $SIMGDP_{ij} = 0.5$ (equal country size)
FDST	Total real inward foreign direct investment (FDI) stock	$FDSTij = FDSi + FDSj$ For associate and subsidiary enterprises, it is the value of the share of their capital and reserves (including retained profits) attributable to the parent enterprise (this is equal to total assets minus total liabilities), plus the net indebtedness of the associate or subsidiary to the parent firm. For branches, it is the value of fixed assets and the value of current assets and investments, excluding amounts due from the parent, less liabilities to third parties. The FDS, expressed in current USD, is deflated by the CPI index with 2000 as the base year.
SIMFDS	Similarity in the inward FDI stock of trade partners	$SIMFDS_{ij} = 1 - \frac{FDS_i^2}{(FDS_i + FDS_j)^2} - \frac{FDS_j^2}{(FDS_i + FDS_j)^2}$
RLFAC	Similarity in capital-labour ratios or the distance between countries in terms of relative factor endowments	$RLFAC_{ij} = \lvert \ln(K_{jt}/L_{jt}) - \ln(K_{it}/L_{it}) \rvert$ where K = capital stock; and L = labour force If $RLFAC_{ij} = 0$ (same proportion of factor endowments) Total labour force comprises people ages 15 and older who meet the International Labour Organization definition of theeconomically active population. Capital stock is estimated from the GFCF using the standard perpetual inventory calculation method (see footnote 1). The GFCF consists of outlays on additions to the fixed assets (land improvements; plant,machinery and equipment purchases; construction of roads, railways and the like) of the economy plus net changesin the level of inventories. The GFCF, expressed in current USD, is deflated by the CPI index with 2000 as the base year.
GD	Geographical distance	The average distance (in kilometres) between the capitals of i and j.

Table 1a: Intra-Regional Trade Shares (in per cent)

	Exports			**Imports**			**All Products**		
	Agri	Manu	Total	Agri	Manu	Total	Agri	Manu	Total
	% of World Trade of ASEAN								
ASEAN									
1990	16.89	21.72	21.13	28.98	16.91	17.64	21.16	19.11	19.29
2000	19.22	24.69	24.31	24.88	23.03	23.12	21.35	23.91	23.76
2010	22.32	26.04	25.71	30.45	23.71	24.11	25.36	24.93	24.96
ASEAN5									
1990	15.18	20.99	20.28	27.85	16.41	17.11	19.65	18.50	18.61
2000	14.15	22.08	21.52	20.21	21.62	21.55	16.43	21.86	21.53
2010	16.54	22.88	22.32	24.24	22.18	22.31	19.42	22.54	22.31
ASEAN*									
1990	2.31	1.26	1.39	1.13	0.50	0.54	1.89	0.85	0.94
2000	5.35	2.83	3.01	4.14	1.24	1.38	4.90	2.08	2.25
2010	9.00	4.21	4.59	5.68	1.35	1.61	7.75	2.84	3.21
	% of Intra-ASEAN Trade								
ASEAN5									
1990	86.71	94.23	93.48	96.09	97.05	96.95	91.17	95.57	95.13
2000	72.50	88.60	87.70	81.40	94.13	93.45	76.36	91.09	90.28
2010	64.73	84.23	82.76	79.78	93.78	92.73	70.99	88.48	87.08
ASEAN*									
1990	13.17	5.67	6.42	3.91	2.95	3.05	8.77	4.38	4.82
2000	27.41	11.35	12.25	16.69	5.39	5.99	22.75	8.67	9.44
2010	35.20	15.52	17.01	18.70	5.71	6.69	28.34	11.16	12.53

Note: (1) Agri – Agriculture; Manu – Manufactures.
(2) ASEAN5 refers to two-way trade flows between pioneer economies and ASEAN* refers to two-way trade flows between pioneer and newer member economies.
(3) The figures in the second panel do not add up to 100% as ASEAN* does not include two-way trade between the newer member economies.

Source: Calculated from UN COMTRADE.

Table 1b: Intra-Regional Trade Shares, by Member Economies (in per cent)

		Exports			Imports			All Products		
		Agri	Manu	Total	Agri	Manu	Total	Agri	Manu	Total
Malaysia	1990	27.04	29.56	29.27	26.47	18.75	19.30	26.83	24.03	24.30
	2000	26.50	26.53	26.53	23.87	24.28	24.26	25.42	25.51	25.50
	2010	20.11	26.08	25.40	38.67	26.09	27.09	26.90	26.08	26.17
Singapore	1990	20.77	25.08	24.84	41.10	18.89	20.30	32.30	21.78	22.41
	2000	39.65	29.91	30.14	43.23	29.13	29.60	41.74	29.53	29.87
	2010	41.47	30.08	30.31	37.39	23.57	24.02	39.07	27.05	27.36
Thailand	1990	10.17	12.65	11.92	6.64	13.43	13.08	9.45	13.17	12.61
	2000	14.57	20.24	19.40	12.78	16.83	16.65	14.18	18.53	18.09
	2010	20.28	23.07	22.70	16.87	16.62	16.63	19.42	19.80	19.77
Philippines	1996	6.98	15.35	14.46	20.48	11.65	12.38	14.65	13.00	13.15
	2000	8.74	16.08	15.71	16.41	15.88	15.92	13.23	15.98	15.81
	2010	12.61	23.23	22.42	41.00	26.42	28.10	30.58	24.89	25.44
Indonesia	1990	14.92	9.32	9.96	13.66	8.33	8.61	14.57	8.85	9.34
	2000	17.11	17.56	17.52	18.71	19.42	19.35	17.72	18.21	18.16
	2010	22.54	20.87	21.14	18.16	29.69	28.68	21.15	25.13	24.62
Brunei	1992	87.48	23.51	23.51	64.54	30.95	35.24	64.54	26.18	28.10
	2001	81.39	22.10	22.13	72.30	47.01	51.58	72.37	27.20	29.16
	2006	24.25	24.78	24.77	76.73	41.92	47.89	75.52	27.42	28.94
Cambodia	2000	53.73	5.09	5.57	63.53	36.45	39.10	62.67	20.31	22.62
	2005	55.43	4.23	4.73	75.83	27.41	31.02	73.11	14.46	16.78
	2010	27.71	12.33	12.58	77.26	31.06	34.35	66.95	20.81	22.75
Myanmar	1992	29.89	32.89	31.32	80.34	19.72	28.63	43.95	23.53	29.76
	2009	----	----	----	82.87	44.00	46.78	82.87	44.00	46.78
Vietnam	2000	12.67	36.80	30.56	17.36	10.44	10.82	13.54	21.53	20.31
	2005	14.53	28.49	25.61	23.13	12.43	13.12	16.79	19.30	18.97
	2009	16.00	26.15	23.99	22.53	12.65	13.44	18.07	18.20	18.18

Notes: (1) ---- data is not available.
(2) For other notes, refer to Table 1a.

Table 2a: Aggregate GL Index for ASEAN5 (in per cent)

	All Products			Agriculture			Manufactures		
Country-pair	2000	2005	2010	2000	2005	2010	2000	2005	2010
MYS-SGP	45.11	43.35	38.16	29.40	8.37	10.83	47.72	47.24	43.06
MYS-THA	38.11	32.64	33.33	7.25	8.21	8.14	48.69	40.45	41.48
MYS-PHL	26.40	22.35	23.39	4.93	6.55	9.08	28.81	25.48	32.41
MYS-IDN	25.32	20.59	16.09	19.31	8.23	8.73	28.42	27.80	22.37
SGP-THA	39.47	44.18	37.88	8.52	12.64	8.56	41.35	45.78	41.05
SGP-PHL	31.87	38.30	36.75	6.36	6.55	16.12	33.25	40.38	38.49
SGP-IDN	13.81	16.65	32.69	16.72	7.42	9.71	13.18	18.36	41.43
THA-PHL	36.85	31.51	21.73	7.98	4.30	2.61	38.40	35.55	26.33
THA-IDN	22.39	30.49	18.34	18.84	38.19	2.19	24.55	27.16	23.79
PHL-IDN	3.95	5.50	4.77	3.87	3.18	1.70	4.02	8.98	10.05

Notes: (1) The GL index is calculated at the 5-digit SITC (Standard International Trade Classification) level, prior to aggregation.
(2) MYS – Malaysia; SGP – Singapore; THA – Thailand; PHL – Philippines; and IDN – Indonesia.

Source: Calculated from UN COMTRADE.

Table 2b: Aggregate GL Index for ASEAN* (in per cent)

	All Products			Agriculture			Manufactures		
Country-pair	2000	2005	2010	2000	2005	2010	2000	2005	2010
MYS-BRU	1.05	3.12	3.33	0.28	5.49	2.94	1.67	1.59	3.56
MYS-CAM	0.88	0.88	1.62	0.20	1.65	2.37	1.33	0.64	1.35
MYS-LAOS	0.00	0.02	0.12	0.00	0.00	0.00	0.00	0.02	0.13
MYS-MYA	0.37	0.49	0.70	0.01	0.16	0.17	2.48	1.00	1.92
MYS-VIET	4.67	8.38	14.92	0.42	2.19	15.92	9.33	14.08	13.95
SGP-BRU	3.78	4.72	5.15	0.19	0.15	0.29	5.20	5.37	6.14
SGP-CAM	0.77	11.89	4.53	0.64	43.90	7.00	0.85	2.33	2.93
SGP-LAOS	0.10	0.04	1.03	0.00	0.00	0.06	0.79	0.37	2.60
SGP-MYA	2.18	1.41	1.08	1.64	0.97	0.49	2.46	1.65	1.31
SGP-VIET	5.52	6.87	13.48	1.14	1.31	5.91	9.41	11.96	15.91
THA-BRU	0.03	0.00	0.00	0.00	0.00	0.00	1.62	0.00	0.00
THA-CAM	1.70	0.82	7.26	4.54	1.96	0.47	0.72	0.29	10.83
THA-LAOS	0.36	3.11	12.56	0.29	7.19	27.62	0.39	0.73	5.08
THA-MYA	0.50	0.20	0.49	0.32	0.15	0.29	0.68	0.42	1.05
THA-VIET	2.88	8.87	14.51	4.47	7.89	9.31	2.75	8.96	15.12
PHL-BRU	0.11	0.10	0.14	0.00	0.00	0.00	0.16	0.14	0.18
PHL-CAM	5.87	1.74	0.32	0.00	0.00	0.08	8.27	2.23	0.39
PHL-MYA	1.06	0.04	0.06	0.00	0.00	0.12	1.76	0.05	0.01
PHL-VIET	1.55	1.90	4.12	0.09	0.53	1.05	4.21	3.44	9.79
IDN-BRU	0.34	0.02	0.05	0.00	0.00	0.00	0.75	0.72	0.66
IDN-CAM	1.40	0.04	0.42	0.52	0.00	0.09	2.33	0.11	1.96
IDN-LAOS	0.00	0.00	9.92	0.00	0.00	79.20	0.00	0.00	5.29
IDN-MYA	0.19	0.29	0.03	0.07	0.14	0.02	0.25	0.37	0.04
IDN-VIET	12.83	3.13	10.37	20.85	0.59	4.08	2.49	5.76	13.71

Notes: (1) MYS – Malaysia; SGP – Singapore; THA – Thailand; PHL – Philippines; IDN – Indonesia; BRU – Brunei; CAM – Cambodia; LAOS – Laos; and MYA – Myanmar.
(2) For other notes, see Table 2a.
Source: Calculated from UN COMTRADE.

Table 3: Determinants of Intra-ASEAN Trade Flows

	RE			HT			RE			HT		
	ASEAN	**ASEAN5**	**ASEAN***	**ASEAN**	**ASEAN5**	**ASEAN***	**ASEAN**	**ASEAN5**	**ASEAN***	**ASEAN**	**ASEAN5**	**ASEAN***
	Dependent Variable: ln*X*						Dependent Variable: ln*TRADE*					
ln*GDPT*	0.803***	-0.063	0.888***	2.703***	-0.104	3.405***	0.643***	-0.069	0.566***	3.105***	-0.101	4.061***
	(0.178)	(0.159)	(0.218)	(0.481)	(0.154)	(0.630)	(0.134)	(0.134)	(0.155)	(0.484)	(0.132)	(0.631)
SIMGDP	0.081***	-0.024***	0.114***	0.136***	-0.029***	0.201***	0.054***	-0.023***	0.062***	0.138***	-0.027***	0.213***
	(0.012)	(0.008)	(0.018)	(0.019)	(0.008)	(0.028)	(0.008)	(0.006)	(0.014)	(0.019)	(0.007)	(0.028)
ln*GD*	-2.923***	-1.116***	-2.643***	-4.198***	-1.041**	-3.419**	-2.431***	-1.073**	-2.322***	-4.228***	-1.015**	-3.457**
	(0.391)	(0.436)	(0.518)	(0.966)	(0.499)	(1.438)	(0.290)	(0.407)	(0.348)	(0.962)	(0.447)	(1.432)
ln*FDST*	0.246	-0.356***	0.100	-1.237***	-0.369***	-1.430***	0.735***	-0.458***	0.873***	-1.332***	-0.467***	-1.530***
	(0.212)	(0.078)	(0.245)	(0.239)	(0.093)	(0.300)	(0.190)	(0.067)	(0.218)	(0.241)	(0.080)	(0.301)
SIMFDS	0.032***	-0.003	0.019*	0.021***	-0.003	0.012	0.026***	-0.001	0.011	0.012*	-0.001	0.003
	(0.009)	(0.003)	(0.011)	(0.007)	(0.003)	(0.009)	(0.009)	(0.002)	(0.011)	(0.007)	(0.003)	(0.009)
RLFAC	-0.937***	0.060	-0.544**	-1.188**	0.032	-0.698**	-0.885***	0.206	-0.583***	-1.158**	0.192*	-0.610**
	(0.194)	(0.157)	(0.216)	(0.216)	(0.016)	(0.289)	(0.163)	(0.142)	(0.166)	(0.217)	(0.116)	(0.290)
constant	4.349	41.254***	0.299	-7.347	42.500***	-32.217	-4.556	44.240***	-8.724	-15.618	45.184***	-47.907**
	(7.228)	(6.704)	(8.400)	(15.970)	(6.229)	(21.750)	(5.762)	(6.075)	(6.222)	(16.024)	(5.415)	(21.758)
Year effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of obs.	2730	840	1890	2730	840	1890	2730	840	1890	2730	840	1890
No. of groups	130	40	90	130	40	90	130	40	90	130	40	90
R^2 overall	0.247	0.255	0.168				0.326	0.274	0.284			
Breusch-Pagan	$\chi^2(1)$ = 5182.00	$\chi^2(1)$ = 6873.12	$\chi^2(1)$ = 2976.88				$\chi^2(1)$ = 2380.46	$\chi^2(1)$ = 7036.10	$\chi^2(1)$ = 1003.17			
LM test												
Wald test	659.94	2122.42	551.63	1392.81	2457.66	1104.54	685.77	2556.64	557.64	1382.06	3076.96	1131.45

Notes: 1. The figures in parentheses for the RE model are the standard errors, adjusted for clustering on country-pair-product group.

***significant at 1%, **significant at 5% and * significant at 10%.

Table 4: Determinants of Intra-ASEAN Trade Flows in Agriculture

	RE			HT			RE			HT		
	ASEAN	**ASEAN5**	**ASEAN***	**ASEAN**	**ASEAN5**	**ASEAN***	**ASEAN**	**ASEAN5**	**ASEAN***	**ASEAN**	**ASEAN5**	**ASEAN***
	Dependent Variable: ln*X*						Dependent Variable: ln*TRADE*					
ln*GDPT*	0.734**	-0.144	0.864**	2.097***	-0.229	2.599***	0.545***	0.188	0.517**	2.840***	-0.211	3.872***
	(0.294)	(0.210)	(0.370)	(0.683)	(0.215)	(0.896)	(0.191)	(0.128)	(0.224)	(0.679)	(0.178)	(0.887)
SIMGDP	0.078***	0.004	0.114***	0.114***	0.0005	0.164***	0.042***	0.003	0.052**	0.129***	-0.002	0.203***
	(0.018)	(0.008)	(0.029)	(0.027)	(0.009)	(0.040)	(0.012)	(0.004)	(0.020)	(0.026)	(0.008)	(0.040)
ln*GD*	-2.629***	-1.496***	-2.203**	-3.625***	-1.471***	-2.765	-2.007***	-1.527***	-1.894***	-3.871***	-1.465***	-3.019
	(0.613)	(0.298)	(0.864)	(1.361)	(0.435)	(2.054)	(0.383)	(0.127)	(0.481)	(1.329)	(0.379)	(1.984)
ln*FDST*	0.009	-0.578***	-0.232	-1.292***	-0.619***	-1.466***	0.709***	-0.683***	0.789**	-1.511***	-0.855***	-1.672***
	(0.322)	(0.110)	(0.374)	(0.340)	(0.142)	(0.427)	(0.265)	(0.092)	(0.312)	(0.339)	(0.116)	(0.425)
SIMFDS	0.028**	-0.008*	0.014	0.016	-0.010**	0.006	0.024**	-0.0004	0.010	0.009	-0.006	-0.001
	(0.013)	(0.005)	(0.015)	(0.010)	(0.005)	(0.013)	(0.012)	(0.003)	(0.015)	(0.010)	(0.004)	(0.013)
RLFAC	-1.043***	-0.017	-0.674**	-1.453***	-0.104	-1.043**	-0.836***	0.214***	-0.561**	-1.273***	0.118	-0.712*
	(0.287)	(0.185)	(0.332)	(0.306)	(0.181)	(0.412)	(0.215)	(0.081)	(0.229)	(0.304)	(0.151)	(0.407)
constant	9.302	47.130***	5.164	7.839	50.781***	-11.898	-4.723	40.212***	-8.839	-6.324	56.429***	-42.260
	(11.561)	(7.716)	(13.792)	(22.632)	(7.761)	(30.981)	(8.079)	(5.249)	(8.738)	(22.442)	(6.421)	(30.510)
Year effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of obs.	1365	420	945	1365	420	945	1365	420	945	1365	420	945
No. of groups	65	20	45	65	20	45	65	20	45	65	20	45
R^2 overall	0.183	0.542	0.107				0.308	0.727	0.265			
Breusch-Pagan	$\chi^2(1)$ = 2953.75	$\chi^2(1)$ = 773.19	$\chi^2(1)$ = 1919.82				$\chi^2(1)$ = 850.21	$\chi^2(1)$ = 441.54	$\chi^2(1)$ = 412.92			
LM test												
Wald test	310.23	1512.08	271.26	638.73	858.05	512.26	316.67	971.02	258.56	636.83	1121.2	528.65

Notes: 1. The figures in parentheses for the RE model are the standard errors, adjusted for clustering on country-pair-product group.
***significant at 1%, **significant at 5% and * significant at 10%.

Table 5: Determinants of Intra-ASEAN Trade Flows in Manufactures

	RE			HT			RE			HT		
	ASEAN	**ASEAN5**	**ASEAN***	**Full Sample**	**ASEAN5**	**ASEAN***	**ASEAN**	**ASEAN5**	**ASEAN***	**ASEAN**	**ASEAN5**	**ASEAN***
	Dependent Variable: ln*X*						Dependent Variable: ln*TRADE*					
ln*GDPT*	0.618***	0.256	0.580***	3.323***	0.102	4.237***	0.615***	0.010	0.546***	3.354***	0.142	4.252***
	(0.170)	(0.156)	(0.209)	(0.682)	(0.181)	(0.898)	(0.163)	(0.110)	(0.203)	(0.692)	(0.150)	(0.906)
SIMGDP	0.065***	-0.010**	0.080***	0.158***	-0.054***	0.238***	0.055***	-0.001	0.065***	0.146***	-0.043***	0.224***
	(0.011)	(0.005)	(0.018)	(0.027)	(0.010)	(0.040)	(0.010)	(0.003)	(0.018)	(0.027)	(0.008)	(0.041)
ln*GD*	-2.823***	-1.312***	-2.895***	-4.781***	-0.665	-4.083**	-2.612***	-1.226***	-2.708***	-4.572***	-0.721	-3.894*
	(0.390)	(0.187)	(0.503)	(1.390)	(0.657)	(2.097)	(0.370)	(0.111)	(0.471)	(1.377)	(0.519)	(2.076)
ln*FDST*	1.123***	0.021	1.070***	-1.181***	-0.113	-1.406***	1.172***	0.182**	1.136***	-1.149***	-0.074	-1.384***
	(0.260)	(0.097)	(0.304)	(0.339)	(0.108)	(0.427)	(0.259)	(0.077)	(0.303)	(0.345)	(0.090)	(0.432)
SIMFDS	0.038***	0.005	0.022	0.026***	0.005	0.018	0.029**	0.004	0.013	0.016	0.005	0.006
	(0.013)	(0.004)	(0.016)	(0.010)	(0.004)	(0.013)	(0.013)	(0.003)	(0.016)	(0.010)	(0.003)	(0.013)
RLFAC	-0.787***	0.438***	-0.489**	-0.921***	0.250	0.395	-0.859***	0.364***	-0.591**	-1.033***	0.307**	-0.503
	(0.220)	(0.109)	(0.234)	(0.307)	(0.159)	(0.378)	(0.219)	(0.059)	(0.231)	(0.310)	(0.132)	(0.417)
constant	-10.956	22.933***	-10.495	-22.890	28.003	-0.364	-12.273	26.459***	-11.036	-24.638	26.492***	-53.690*
	(7.651)	(6.562)	(8.700)	(22.707)	(7.589)	(0.413)	(7.461)	(4.799)	(8.457)	(22.922)	(6.181)	(31.327)
Year effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of obs.	1365	420	945	1365	420	945	1365	420	945	1365	420	945
No. of groups	65	20	45	65	20	45	65	20	45	65	20	45
R^2 overall	0.412	0.797	0.324				0.408	0.884	0.334			
Breusch-Pagan	$\chi^2(1) = 926.09$	$\chi^2(1) = 759.79$	$\chi^2(1) = 434.64$				$\chi^2(1) = 823.42$	$\chi^2(1) = 273.63$	$\chi^2(1) = 380.88$			
LM test												
Wald test	412.28	1772.28	325.89	756.04	2313.66	591.45	431.74	2667.40	329.30	739.90	3164.55	592.38

Notes: 1. The figures in parentheses for the RE model are the standard errors, adjusted for clustering on country-pair-product group.
***significant at 1%, **significant at 5% and * significant at 10%.