ASSESSING THE TRADE IMPACTS OF THE ASEAN +6 FTA: THE CASE OF LAO PEOPLE'S DEMOCRATIC REPUBLIC

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Contents

Abstract

Using an unbalanced panel dataset of bilateral exports from 1992 to 2009, this paper assesses the potential trade impacts of the expansion of the Association of Southeast Asian Nations (ASEAN) to ASEAN+3 and ASEAN+6 on the Lao People's Democratic Republic (Lao PDR). It finds that bilateral exports are positively related to the overall bilateral country size and similarity in country size, but inversely related to the relative factor endowment differences, transportation costs, and import tariffs. Simulation results show that the formation of free trade agreement (FTA) between ASEAN and the Plus-6 economies (the People's Republic of China, Japan, and the Republic of Korea in East Asia; and the other three economies of Australia, India, and New Zealand) can increase bilateral trade between the Lao PDR and ASEAN+6 by $1 billion, and ASEAN+3 by $981 million. Nonetheless, trade balance of the Lao PDR is likely to worsen in both the ASEAN+3 and ASEAN+6 FTAs because they stimulate more imports than exports.

1.   Introduction

Over the past two decades, economic interdependence in Southeast Asia and East Asia has strengthened due to rising intraregional trade from 29.4% in 1990 to 38.8% in 2011 (Asia Regional Integration Center 2013).[1] Although a late adopter of the free trade agreement (FTA) as a trade policy instrument, the region is now at the forefront of world FTA activity (Feridhanusetyawan 2005; Fiorentino et al. 2009). One key concern in Asian FTAs is the complicated rules of origin, where overlapping FTAs pose a severe burden on small- and medium-size enterprises, which have less ability to meet trade-related business costs (Manchin and Pelkmans-Balaoing 2007; Tumbarello 2007). Restrictive rules of origin in Asian FTAs deter the use of FTA preferences, while complex rules of origin raise transactions costs for firms. These challenges can be addressed through the formation of an East Asia Free Trade Area (EAFTA) among ASEAN+3 countries and a Comprehensive Economic Partnership for East Asia (CEPEA) among ASEAN+6 countries (Kawai and Wignaraja 2011).[2] The establishment of EAFTA can generate tangible benefits by harmonizing rules of origin in a region that thrives on global product fragmentation. In addition, the establishment of CEPEA brings India and Australia to the fore at a time when the region production network expands beyond ASEAN+3.

The primary objective of this paper is to evaluate the trade impact of ASEAN+3 and ASEAN+6 FTAs on the Lao People's Democratic Republic (Lao PDR). As one of the smallest and open economies in the region, the Lao PDR is likely to benefit from increased trade integration. This study employs a panel data of 16 countries from 1992 to 2009, which coincides with the period of rising intraregional trade. It estimates a dynamic panel gravity model and conducts simulation analyses based on various reductions in tariff rates to ascertain the impact of ASEAN+3 and ASEAN+6 FTAs on the Lao PDR.

Most existing studies on ASEAN show that trade agreements in the region play an important role in promoting intraregional trade. Kien (2009) indicates that the ASEAN free trade area (AFTA) has increased trade among its members. Shepherd and Wilson (2009) find that the reduction in applied tariffs to the region's average raises intra-ASEAN trade by about 2%. In addition, Lee and Park (2005) and Lee and Shin (2006) find that most East Asian trade agreements create more intra-bloc trade rather than divert extra-bloc trade. In particular, Suvannaphakdy et al. (2011) find that the establishment of a free trade area in ASEAN+6 raises intraregional trade by about 39%. However, Hapsari and Mangunsung (2006) find that AFTA may divert trade from countries outside the trade bloc to possibly less efficient countries inside the trade bloc. The possible trade diversion of AFTA is also supported by Elliott and Ikemoto (2004). They find that the Asian financial crisis generated a stronger tendency to import from members of ASEAN.

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[1]   Southeast Asia refers to the 10 Association of Southeast East Asia Nations (ASEAN): Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Viet Nam. East Asia refers to the People's Republic of China (PRC), Japan, and the Republic of Korea.

[2]   ASEAN+3 refers to the 10 ASEAN economies plus the PRC, Japan, and the Republic of Korea, while ASEAN+6 refers to ASEAN+3 plus Australia, India, and New Zealand.

This paper contributes to the literature in two ways. First, it models bilateral trade flows as a dynamic panel specification that incorporates multilateral resistance terms. Baldwin and Taglioni (2006) and Baier and Bergstrand (2010) recommend the inclusion of the multilateral resistance terms as a way to obtain unbiased estimates, while Martínez-Zarzoso et al. (2009), De Benedictis et al. (2005), and Eichengreen and Irwin (1997) find that the exports series tend to be highly persistent, suggesting the importance of a dynamic specification. Second, previous studies, such as Lee and Park (2005) and Lee and Shin (2006) tend to sample a large group of FTA countries and then draw conclusions for Asia. This paper, however, specifically examines the case for ASEAN+3 and ASEAN+6, which provides a more representative estimate of trade flows for the region.

The paper is divided into six sections. In Section 2, some stylized facts of the Lao PDR's trade with the region are discussed. Section 3 outlines the conceptual framework and discusses the econometric model. Data collection is explained in Section 4. Empirical results and policy implications are found in Section 5, while Section 6 concludes.

2. Trade between Lao PDR and ASEAN+6: Some Stylized Facts

Bilateral trade between the Lao PDR and ASEAN+6 has increased in absolute terms as well as in its relative importance to each other's total trade. Parallel to the growth of the Lao PDR's total trade between 2001 and 2012 was the rise in its bilateral trade with ASEAN+6, which increased almost ten-fold from $0.8 billion in 2001 to $7.3 billion in 2012 (Figure 1). In addition, the Lao PDR has gradually exported more to ASEAN+6. In 1995, almost half of the Lao PDR's exports went to the European Union (EU) (Figure 2). This changed since 2005, and in 2012, its exports to ASEAN+6 was $2.1 billion compared to $0.3 billion to the EU. What is also noteworthy is that since the global financial crisis, the growth of Lao PDR's exports has come mainly from the demand from ASEAN+6—Lao PDR's exports grew by 46.2% in 2010 (1.5% in 2009), supported by 53.1% growth in exports to ASEAN+6 (Figure 3).

ASEAN+6 has provided the opportunity for Lao PDR to deepen and broaden its exports. Lao PDR's exports to ASEAN+6 have gradually shifted from primary to manufactured goods. Between 1990 and 1995, Lao PDR's exports to ASEAN+6 were dominated by agricultural and mineral goods, accounting for more than 90% of its total exports (Table 1). However, since 1997 when Lao PDR became a member of ASEAN, the share of agricultural and mineral goods in the country's exports to ASEAN+6 fell from 89.8% in 1995 to 65.5% in 2012, while the share of manufactured goods increased from 5.4% to 26.7% in the same period.

In contrast to exports, Lao PDR's import sources have remained unchanged. ASEAN+6 accounted for about 92.4% of Lao PDR's total imports over the period 1990–2012 (Figure 4). Although the bulk of imports continue to be intermediate goods, its share has diminished over the years (Figure 5). This has been matched by an increase in the imports of final goods. In 2012, imports of final goods accounted for 57.6% of gross imports (51.1% in 2000), consisting mainly of capital goods, motor vehicles, and garments.

In terms of tariff barriers, some major trading partners of Lao PDR such as Thailand, the PRC, Viet Nam, and the Republic of Korea have higher tariff rates on agricultural products than countries in the EU. In 2008, Lao exporters faced the weighted most-favored-nation (MFN) tariff rate of 29.7% imposed by the PRC, which was substantially higher compared to that of 1.6% in the EU (Table 2). Similarly, the Lao PDR also imposes a higher tariff rate on agricultural products (19.5%) than on non-agricultural products (8.2%) (Table 3). The high tariff barriers for agricultural products underline the argument made by Kawai and Wignaraja (2011) for a more comprehensive coverage of agricultural trade in Asian FTAs.

3.   Model Specification

Following De Benedictis et al. (2005) and Martínez-Zarzoso et al. (2009), we formulate a dynamic gravity model that captures both the intra and inter-industry trade flows. The estimated model is as follows:

$$\ln X_{ijt} = \phi_0 + \gamma\lambda_t + \phi_1\ln X_{ij,t-1} + \phi_2 LGDPT_{ijt} + \phi_3 LSIM_{ijt} + \phi_4 LdGDP_{ijt} + \phi_5 LDist^*_{ij} + \phi_6 Tar^*_{ijt} + \mu_{ij} + v_{ijt} \tag{1}$$

where lnX_{ijt} denotes the log of real bilateral exports of country i to country j in year t, ϕ_0 is the constant term, λ_t is the time-specific fixed effects, μ_{ij} is the country-pair effects, and v_{ijt} is the log-normally distributed error term.

$lnX_{ij,t-1}$ is the one-period lagged bilateral exports used to capture trade persistence that underlines the dynamic nature of the model. Trade persistence arises from sunk costs associated with barriers to entry and exit borne by exporters and product familiarity by consumers (Eichengreen and Irwin 1997). As such, ignoring the impact of lagged trade on current trade may result in biased estimates (Bun and Klaassen 2002).

$LGDPT_{ijt}$ is the overall bilateral country size,[3] $LSIM_{ijt}$ is the similarity in bilateral country size,[4] and $LDist^*_{ij}$ is the restricted distance that proxies for transportation costs. These are control variables based on new trade theory that captures intra-industry trade (Helpman 1987; Hummels and Levinsohn 1995). The coefficient of $LGDPT_{ijt}$ is expected to be positive—the larger the overall economic size, the higher the volume of trade. Larger economies not only boost greater production capacity and opportunities for investment, they also represent a bigger source of demand for products and services.

$LSIM_{ijt}$ is included to capture the contribution of intra-industry trade to total trade. Helpman and Krugman (1985) show greater similarity in economic size between trading partners contributes to more intra-industry trade due to greater potentials for overlapping demand for

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[3] $LGDPT_{ijt} = \ln(GDP_{it} + GDP_{jt})$.

[4] $LSIM_{ijt} = \ln\left[1 - \left(GDP_{it}/(GDP_{it} + GDP_{jt})\right)^2 - \left(GDP_{jt}/(GDP_{it} + GDP_{jt})\right)^2\right]$.

differentiated products. The higher the value of $LSIM_{ij}$, the greater the similarity between the two economies. Thus, the coefficient on $LSIM_{ijt}$ is expected to be positive.

Restricted distance, $LDist^*_{ij} = LDist_{ij} - MD_{ij}$, where $LDist_{ij}$ is the log of distance between exporter and importer, and MD_{ij} is the multilateral and world resistance term of distance. Specifically MD_{ij} is defined as follows:

$$MD_{ij} = \left[\frac{1}{N}\left(\sum_{j=1}^{N} LDist_{ij}\right) + \frac{1}{N}\left(\sum_{i=1}^{N} LDist_{ij}\right) - \frac{1}{N^2}\left(\sum_{i=1}^{N}\sum_{j=1}^{N} LDist_{ij}\right)\right], \qquad (2)$$

where *N* is the number of countries in the sample. MD_{ij} measures the average distance of *i* vis-à-vis its trading partners and the average distance of *j* vis-à-vis its trading partners (the multilateral resistance component) as well as the average distance of all countries (the world resistance component) (Baier and Bergstrand 2010). A higher MD_{ij} therefore implies that the average distances of *i* and *j* from their trading partners are larger than the distance between *i* and *j*, which means lower trade costs between *i* and *j*, and a higher volume of trade between *i* and *j*.

Tar^*_{ijt}, is the restricted tariff rates and the main variable of interest that measures the potential trade impact of ASEAN+3 and ASEAN+6. In particular, $Tar^*_{ijt} = Tar_{ijt} - MT_{ijt}$, where Tar_{ijt} is the average MFN tariff rate of all products imposed by *j* on *i*; and MT_{ijt} is similarly defined as MD_{ij}, but in this case the multilateral and world resistance term of tariffs:

$$MT_{ijt} = \left[\frac{1}{N}\left(\sum_{j=1}^{N} Tar_{ijt}\right) + \frac{1}{N}\left(\sum_{i=1}^{N} Tar_{ijt}\right) - \frac{1}{N^2}\left(\sum_{i=1}^{N}\sum_{j=1}^{N} Tar_{ijt}\right)\right]. \qquad (3)$$

Intuitively, MT_{ijt} is interpreted in the same way as MD_{ij}: a higher MT_{ijt} implies larger average tariff rates of *i* and *j* relative to their trading partners, rather than between each other, which means a greater potential for trade between *i* and *j*. In essence, both $LDist^*_{ij}$ and Tar^*_{ijt} are measures of trade costs that attempt to account for the impact of a third-country. The coefficients on $LDist^*_{ij}$ and Tar^*_{ijt} are expected to be negative because the impacts of bilateral distance and tariff rates ($LDist_{ij}$ and Tar_{ijt}) on bilateral trade are assumed to be stronger than those of the multilateral and world resistances (MD_{ij} and MT_{ijt}).

$LdGDP_{ijt}$ is the absolute difference in the GDP per capita of the exporter and importer.[5] It is used to capture differences in relative factor endowments in the context of inter-industry trade. The coefficient of $LdGDP_{ijt}$ can be positive or negative. A positive coefficient is consistent with the Heckscher-Ohlin-Samuelson (HOS) model, which posits that countries export products which use abundant and cheap factors of production and import products which use scarce factors of production. Hence, countries with dissimilar levels of income per capita trade more than countries with similar levels (Baltagi et al. 2003; Bergstrand 1990). On the other hand, a negative coefficient is consistent with the Linder hypothesis, which argues that countries with similar levels of income per capita—smaller absolute differences in income

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[5] $LdGDP_{ijt} = \left|\ln(GDP_{it}/population_{it}) - \ln(GDP_{jt}/population_{jt})\right|.$

per capita—trade more with each other because they have similar preferences for differentiated products (Baltagi et al. 2003).

4.   Data and Estimation Issues

This paper samples 16 countries comprising the ten ASEAN economies (Brunei Darussalam, Cambodia, Indonesia, the Lao PDR, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Viet Nam), and the +6 economies (Australia, India, Japan, New Zealand, the PRC, and the Republic of Korea). The period studied is from 1992 to 2009 representing an unbalanced panel of 1,651 observations. It is chosen based on the availability of data and the period of rising intraregional trade. The unbalancedness of panel data is due to zero trade flows and missing trade and import tariff data. The unbalancedness statistic (Ahrens and Pincus 1981) is 0.81, indicating that the dataset is moderately unbalanced.

Real bilateral exports and real GDPs are converted into constant price US dollar using the 2000 US consumer price index (CPI). Nominal bilateral exports are obtained from the International Monetary Fund's (IMF) *Direction of Trade Statistics* (DOTS) and the *United Nations Commodity Trade* (UNComtrade) database. US CPI and nominal GDPs in US dollar are compiled from the IMF's *World Economic Outlook* (WEO) database.

Population data are collected from the IMF's *International Financial Statistics* (IFS) and the WEO databases. Distance is calculated based on the distance in kilometers between the capitals of the exporter and importer. The distance data are obtained from *Centre d'Etudes Prospectives et d'Informations Internationales* (CEPII). Import tariff rate of each country is the simple average MFN tariff rates of all products compiled from World Bank's *World Development Indicators* (WDI). Data sources, summary statistics, and correlation matrix of variables can be found in the appendix.

We apply the system generalized method of moments (GMM) estimator (Arellano and Bover 1995; Blundell and Bond 1998) on Equation (1). Blundell and Bond (1998) show that the system GMM estimator is more robust to weak instrument biases than the difference GMM estimator. System GMM is specifically designed to capture the endogeneity of explanatory variables through the creation of a matrix of instruments. It uses both lagged level observations as instruments for differenced variables and lagged differenced observations as instruments for level variables. It has one set of instruments to deal with endogeneity of explanatory variables and another set to deal with the correlation between lagged dependent variable and the error term. A necessary condition for system GMM is that the error term does not have second-order serial correlation otherwise standard errors of the estimates will grow without bound. Previous studies employing system GMM to estimate a dynamic gravity model include De Benedictis et al. (2005) and Martínez-Zarzoso et al. (2009).

We use the system GMM estimator instead of the Poisson pseudo-maximum likelihood (Santos Silva and Tenreyro 2006) or Heckman sample selection (Helpman et al. 2008) estimator for two reasons. First, our data problem has more to do with the unavailability of the tariff rate (an independent variable) rather than the presence of zero trade flows (the

dependent variable). Both the Poisson pseudo-maximum likelihood and Heckman sample selection estimators can handle zero or missing trade flows, but they require independent variables to be observed for the flows. Second, the persistence of trade flows requires the use of a dynamic model which assumes serial correlation in the error term. The system GMM estimator is robust to the distribution of the error term, but not the Poisson pseudo-maximum likelihood and Heckman sample selection methods (Martin and Pham 2008).

5. Results and Policy Implications

5.1 Estimation Results

To evaluate the impact of the formation of ASEAN+6 FTA on Lao PDR, the gravity model of regional trade flows as per Equation (1) is estimated. Since more than 90% of Lao PDR's trade is accounted by the ASEAN+6 countries, estimates from the model provide a good approximation of the determinants of Lao PDR's and the region's trade. Table 4 reports the results of ASEAN+6 in terms of the short-run and long-run impacts. Our analysis focuses more on the long-run relationships as they account for the effects of trade persistence and are meant to capture the long-run impact of a change in the determinant.

Briefly, in the case of short-run impacts, all variables are statistically significant and have the expected signs: all the new trade theory variables ($LGDPT_{ijt}$, $LSIM_{ijt}$, and $LDist_{ij}^*$) are positively signed, while Tar_{ijt}^* and $LdGDP_{ijt}$ are negatively signed. More important are the various diagnostic tests which lend support to the specification of the model and its robustness. First, the system GMM estimation is validated as there is an absence of second-order serial correlation in the residuals according to the Arellano and Bond test. Second, the model has valid instruments. Hansen's J-test cannot reject the null that model specification is correct and all over-identified instruments are exogenous. Third, the inclusion of time dummies (Roodman 2006) is found to be useful to account for the universal time-related shocks. The Wald test for the time dummies is jointly statistically different from zero.

The model's speed of adjustment is 2.28, meaning it takes more than two years for bilateral trade in ASEAN+6 to respond to a change in one variable, holding other variables constant.[6] This implies, say, a reduction in the tariff rate will take some time for it to have a full impact on the bilateral trade.

In the case of the long-run impacts, all the estimated coefficients are also statistically significant (column two, Table 4). The coefficient of bilateral country size ($LGDPT_{ijt}$) is 1.79,[7] which means a 1% increase in the overall market size of a trading pair raises bilateral exports by

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[6] In the long run, the bilateral exports at the current and previous years are equal, that is, lnXij,t = lnXij,t−1 . The speed of adjustment is calculated as the reciprocal of one minus the coefficient of the lagged bilateral exports, that is, $1/(1-\phi_1)$.

[7] The long-run impacts are calculated in a similar fashion as the speed of adjustment, specifically as $\phi_k/1 - \phi_1$, where k is the coefficient of each explanatory variable. The delta method (Oehlert 1992) calculates these together with the standard errors.

1.79%, implying a faster growth in exports than income. Meanwhile, the coefficient of the similarity of economic size ($LSIM_{ijt}$) is 1.25, which says that a 1% increase in the similarity in country size increases exports in ASEAN+6 by 1.25%, supporting the greater rise in intra-industry trade as the economies become more similar.

On the other hand, the coefficient of $LdGDP_{ijt}$ which measures the absolute difference in GDP per capita of exporter and importer is -0.22, that is, a 1% decrease in the differences in GDP per capita increases bilateral exports by 0.22%. This result is consistent with the Linder hypothesis. The smaller magnitude of $LdGDP_{ijt}$ (0.22), which proxies for inter-industry trade flows, compared with that of $LSIM_{ijt}$ (1.25), which proxies for intra-industry trade flows, implies the greater prevalence of intra-industry trade as opposed to inter-industry trade in the region. This result supports Athukorala's (2012) finding that global production sharing has become a unique feature of the region's economic landscape, with the PRC playing a crucial role as the premier assembly center within the region's production networks.

Both geographical distance ($LDist_{ij}^*$) and import tariffs (Tar_{ijt}^*) have a negative effect on bilateral exports, consistent with a priori. Bilateral exports increased by 0.7% for a 1% decrease in transportation costs (proxied by distance). This evidence suggests the importance of, most notably, land infrastructure development, especially among the least developed ASEAN economies as a means to boost trade.

Of significance is the substantive negative impact of tariff rate on exports. In this case, a unit decline in the tariff rate, increases bilateral exports by 20.2%, which is the largest in magnitude compared to other determinants in the model.[8] This implies that the formation of ASEAN+6 FTA can serve as an important trading bloc to enhance intraregional trade among its member countries.

5.2 Simulation Results

We use the long-run estimates of the model to measure the trade impact on Lao PDR vis-à-vis its trading partners given various changes to the tariff rates. Frankel et al. (1993), Wilson et al. (2005), Shepherd and Wilson (2009), and Athukorala (2012) have used this approach to project trade flows for other countries. In particular, we conduct three simulations based on the extent of tariff reductions: a cut of each economy's tariff rate to the regional average tariff rate; a 50% reduction in each economy's tariff rate; and a complete elimination of tariff in all the economies. Figure 6 shows Cambodia, the PRC, India, the Republic of Korea, the Philippines, Thailand, and Viet Nam have annual average tariff rates higher than the regional average, while Lao PDR's rate is lower, and Singapore is completely tariff free. The figure also shows the level of tariff rate of each economy when it is halved.

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[8] Since the tariff rate is in levels, while the bilateral exports are in natural logarithm, a unit reduction in the regional tariff rate increases bilateral exports by 8.8% (0.088 ×100), other variables being equal. (The other variables are expressed in natural logarithm.)

5.2.1   Scenario 1: Reduction in the tariff rates to the regional average

In Scenario 1, economies that maintain a tariff rate higher than the regional average of 10.16% reduce their tariff rates to that level.[9] Lao PDR together with other economies with lower tariff rates than the regional average do not reduce their tariff rates. Hence, it is assumed that Lao PDR will increase its exports to the economies with higher than regional average tariff rate. Given this assumption, Lao PDR is expected to increase its exports by $95.4 million to ASEAN+6 ($94 million to ASEAN+3), with the largest gains coming from its trade with the PRC ($42 million), followed by Viet Nam ($30.9 million), Thailand ($20.9 million), and India ($1.4 million) (Table 5).[10] In particular, exports such as electricity, minerals, wood and wood products, and garments are likely to increase, as they represent the key products exported from Lao PDR to these economies. In addition, given that the average of the MFN tariff rate for primary products in 2009 is still high—15.7% for Thailand, 11.1% for PRC, and 14% for Viet Nam (2008)—there is more room for it to be lowered.

5.2.2   Scenario 2: 50% reduction in the tariff rates in all economies

Scenario 2 involves a reduction in tariff rates in each economy by half (Figure 6). In this case, Lao PDR benefits from an increase in trade (exports plus imports) with ASEAN+6 by about $366.7 million (Table 6). But the import gains exceed export gains, which worsens the trade balance of Lao PDR by about 41%. In fact, the country records a larger trade deficit with all economies—the largest with Thailand ($82 million)—except Viet Nam (an improvement of $15.1 million). Thailand is the biggest source of imports for the country, while Viet Nam is the biggest export destination.

5.2.3   Scenario 3: Complete tariff elimination in all economies

In this case, Lao PDR benefits from an even larger trade gain with ASEAN+6 by about $1 billion. As in the previous scenario, the country records a trade deficit with all economies except Viet Nam. Interestingly, the country records the largest decline in deficit in percentage terms with Japan. The narrowing trade deficit between Lao PDR and Japan implies a greater increase in Lao PDR's exports than that of imports from Japan. In 2009, the average MFN tariff rate on primary products imposed by Japan was 9.33%, which was more than twice the level for all products (4.19%) and three times higher than the level for manufactured products (2.64%). Tariff eliminations by Japan therefore present Lao exporters with more opportunities to increase the processing of natural resource-based products, which are now exported in primary form.

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[9]   The regional tariff rate is calculated as a simple average of all the economies' tariff rates from 1992 to 2009.
[10] Export gains are calculated as the difference between simulated exports and baseline exports. Baseline exports are calculated based on the long-run model estimates with the average value of each variable from 1992 to 2009 used as inputs. Simulated exports are the calculated the same way, except that the tariff rate is now varied depending on each scenario. Import gains are calculated in the same manner although import numbers are not directly used. The assumption followed is that imports of country A from country B is equivalent to the exports of country B to country A. Hence, import gains of country A with respect to country B is equivalent to the export gains of country B with respect to country A.

5.3 Policy Implications

The key result of this paper—the larger the tariff reduction, the greater the trade (export and import) gains to Lao PDR—points to a key policy implication for further trade liberalization among ASEAN members and their six counterparts. The formation of EAFTA is an option to bring such trade gains to its members. For Lao PDR, however, while its exports and imports both expand, gains in the latter are likely to be greater than the former, leading to a larger trade deficit in the more aggressive cases of tariff reductions. The worsening trade deficit reflects largely the country's position as a net importer of goods and services, primarily intermediate and capital goods. This is likely to be a temporary phenomenon given the country's current stage of economic development. Over time, these imports will help to build the country's domestic productive capacity, which will likely lead to a turnaround in the trade balance (Henry et al. 2009).[11] That said, the turnaround will also depend on the country's ability to improve from its current low levels of competitiveness. Lao PDR is ranked 81 out of 148 economies according to the 2013-2014 Global Competitiveness Index,[12] behind all the other economies in the region, except Cambodia and Myanmar.

Being a landlocked country, Lao PDR can reduce a major trade cost and improve its competitiveness through the construction of new roads and the maintenance or renewal of existing roads that connects the major domestic market centers to the neighboring countries, particularly Viet Nam and Thailand. Although its road network has grown from 14,000 kilometers in 1990 to 35,600 kilometers in 2008, only 14% of the roads were paved (Asian Development Bank 2012). In addition, seasonal closures are frequent—19 out of 139 district centers and one-third of all villages (3,500 out of 10,500) do not have road access in the rainy season.

To further increase its competitiveness to address the widening of trade deficit in joining the EAFTA, the country can invest and train more skilled labor in the manufacturing sector. This will help the country diversify from its heavy export reliance on the agriculture and mineral sectors. Globalization and the prevalence of product fragmentation requires countries to nurture a pool of well-skilled workers who are able to perform complex tasks and adapt rapidly to their changing environment and the evolving needs of the production system (Sala-i-Martin et al. 2013). Access to a skilled labor force facilitates easier connection to regional and global value chains, as lead firms expect suppliers to meet prevailing international quality standards. As such, Lao PDR should consider vocational schools for training and re-training of the labor force capable of working in industries linked to the regional value chains. The 2009 Lao Enterprise Survey shows the lack of skilled labor as a key impediment to private investment.

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[11] Henry et al. (2009) analyze the production frontier of 57 developing countries from 1970 to 1998 and find that trade volume and trade policy play a crucial role in raising output both through technology improvements embodied in imported capital goods and by inducing efficiency improvements. This is especially important for Lao PDR where both physical and human capital and production know-how are still lacking.

[12] See:http://www.weforum.org/reports/global-competitiveness-report-2013-2014

6.   Conclusions

This paper estimates a dynamic gravity model of bilateral exports of the 10 ASEAN economies and six other economies (Australia, the PRC, India, Japan, New Zealand, and the Republic of Korea) from 1992 to 2009. The model incorporates the determinants of the inter-industry and intra-industry trade, and an additional variable of key interest to this study, the import tariff rates. The results show that bilateral exports are positively related to the overall bilateral country size, the similarity in bilateral country size, and inversely related to the relative factor endowment differences, transportation costs, and tariff rates. In particular, the larger magnitude of the similarity in bilateral country size compared to the magnitude of the relative factor endowment differences suggests a greater prevalence of intra-industry trade rather than inter-industry trade in the region. As such, reducing gaps in GDP per capita of the member countries are important to ensure that the benefits of greater trade liberalizations can be realized, especially by the smaller and less developed economies.

To evaluate the potential impact of ASEAN trade enlargement on Lao PDR's trade, this paper uses the above estimated model to simulate three scenarios of tariff reductions. First, reducing the individual countries' tariff rates to the regional average tariff rate increases Lao PDR's trade with ASEAN+6 by $95.4 million (and with ASEAN+3 by $94 million). Second, reducing each individual country tariff rate by half raises Lao PDR's trade by an even greater margin ($366.7 million with ASEAN+6, and $349.4 million with ASEAN+3). Third, similarly, the case of a complete tariff reduction across all economies leads to substantial trade gains ($1 billion with ASEAN+6, and $981 million with ASEAN+3). However, in the last two scenarios, Lao PDR's trade balance is likely to worsen reflecting its weak export competitiveness.

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Table 1. Lao PDR's Exports to and Imports from ASEAN+6 by Product, 1990–2012

Year	Agricultural and Mineral Goods SITC 0-4	Chemicals SITC 5	Manufactured Goods Classified by Material SITC 6	Machinery and Transport Equipment SITC 7	Others SITC 8 - 9	Total Value ($ billion)
Exports to ASEAN+6 (Share of total exports to ASEAN+6, %)						
1990	89.6	0.1	7.4	1.0	1.9	0.1
1995	89.8	3.4	5.4	0.4	1.0	0.1
2000	63.1	0.1	1.9	31.1	3.9	0.2
2005	68.3	0.2	23.1	1.5	7.0	0.4
2010	67.3	0.4	27.6	2.5	2.2	1.7
2011	69.8	1.4	25.9	1.2	1.7	2.6
2012	65.5	2.4	26.7	1.4	3.9	2.4
Imports from ASEAN+6 (Share of total imports from ASEAN+6, %)						
1990	19.2	9.8	19.9	42.1	9.0	0.1
1995	28.3	6.3	22.8	31.7	10.9	0.5
2000	29.9	6.2	23.1	34.3	6.5	0.6
2005	34.8	7.5	21.4	29.1	7.1	1.0
2010	32.8	6.1	20.3	32.3	8.5	3.1
2011	36.0	6.3	18.2	34.3	5.3	3.9
2012	32.5	5.7	16.2	40.4	5.2	5.0

Lao PDR = Lao People's Democratic Republic, PRC = People's Republic of China, SITC = Standard International Trade Classification.
Note: ASEAN+6 are the 10 ASEAN economies (Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Viet Nam) plus the People's Republic of China, Japan, the Republic of Korea, Australia, India, and New Zealand.

Source: Authors' compilation based on Uncomtrade data.

Table 2. Lao PDR's Exports to Major Trading Partners and Duties Faced in 2008

Exports	Value ($ million)	MFN Average of Traded Tariff Line		Duty-Free Imports	
		Simple	Weighted	Tariff Line (%)	Value (%)
Agricultural products					
1. European Union	30	13.3	1.6	90.6	99.1
2. Thailand	28	22.6	26.9	81.2	45.7
3. PRC	17	21.7	29.7	39.1	44.0
4. Viet Nam	12	23.0	18.4	47.3	49.4
5. United States	4	0.0	0.0	100.0	
Non-agricultural products					
1. Thailand	581	12.0	2.6	76.5	95.2
2. Viet Nam	196	17.8	1.1	42.7	97.1
3. European Union	170	7.5	11.8	100.0	
4. PRC	117	6.5	2.3	63.1	86.3
5. Korea, Republic of	52	7.9	2.0	51.4	99.2

Lao PDR = Lao People's Democratic Republic, PRC = Peope's Republic of China.
Note: "MFN average of traded TL: Simple" refers to simple average of most-favored-nation duties based only on tariff lines with imports. "MFN average of traded tariff line: Weighted" refers to trade-weighted average most-favored-nation duty. "Duty-free imports: Tariff line (%)" refers to duty-free tariff lines in per cent of all traded tariff lines. "Duty-free imports: Value" is the share of duty-free trade in per cent of all bilateral trade flows.

Sources: World Trade Organization (WTO), International Trade Centre (ITC), and United Nations Conference on Trade and Development (UNCTAD) (2010).

Table 3. Summary and Duty Ranges of Lao PDR's MFN Applied Tariffs in 2008

Frequency Distribution of Production Category	Tariff Lines (%)					
	0 <=5	5 <=10	10 <=15	15 <=25	25 <=50	Average
Agricultural products	27.3	20.8	0.0	8.2	43.0000	19.5
Non-agricultural products	59.0	33.2	0.1	4.9	2.8	8.2

Lao PDR = Lao People's Democratic Republic; MFN = most-favored-nation.
Source: WTO, ITC, and UNCTAD (2010).

Table 4. Results for Bilateral Exports of All Members in ASEAN+6

Dependent Variable: Bilateral Export	ASEAN+6	
Explanatory Variables:	Short-run	Long-run
Constant	−14.576***	—
	(3.732)	—
Lag one year of bilateral export	0.561***	—
	(0.104)	—
Sum of bilateral country size	0.785***	1.789***
	(0.197)	(0.091)
Similarity in country size	0.548***	1.248***
	(0.134)	(0.079)
Difference in relative factor endowment	− 0.095**	−0.216***
	(0.041)	(0.075)
Distance	−0.313***	−0.712***
	(0.108)	(0.198)
Tariff rate	−0.088**	−0.202**
	(0.039)	(0.088)
Number of observations	1721	
Number of groups	230	
Model degrees of freedom	22	
Residual degrees of freedom	229	
Number of instruments	39	
RMSE	0.76	
Diagnostic tests:		
F(model df, residual df)		203.63***
Wald test for time effects:		
$F($ 16, residual df)		5.34***
Arellano-Bond test for AR(1) in first differences:	Z = −2.95***	
H_0: There is no first-order serial correlation in residuals		
Arellano-Bond test for AR(2) in first differences:	Z = −0.66	
H_0: There is no second-order serial correlation in residuals		
Hansen J-test of overidentifying restrictions:	χ^2(16) = 17.67	
H_0: Model specification is correct and all overidentified instruments are exogenous		

Note: ASEAN+6 are the 10 ASEAN economies (Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Viet Nam) plus the People's Republic of China, Japan, the Republic of Korea, Australia, India, and New Zealand. *** denotes significance at the 1% level; **, at the 5% level; and *, at the 10% level. 'df' refers to degree of freedom. Source: Authors' estimations.

Table 5. Trade Gains of Lao PDR—Reduction of Tariff Rates to Regional Average

Country	Import Gain ($ million)	%	Export Gain ($ million)	%	Trade Balance ($ million)	%
Cambodia	0.00	0.00	0.00	0.00	0.00	0.00
Indonesia	0.00	0.00	0.00	0.00	0.00	0.00
Malaysia	0.00	0.00	0.00	0.00	0.00	0.00
Philippines	0.00	0.00	0.00	0.00	0.00	0.00
Singapore	0.00	0.00	0.00	0.00	0.00	0.00
Thailand	0.00	0.00	20.90	68.75	20.90	−11.51
Viet Nam	0.00	0.00	30.90	78.63	30.90	−239.53
PRC	0.00	0.00	42.20	308.03	42.20	−48.34
Japan	0.00	0.00	0.00	0.00	0.00	0.00
Korea, Republic of	0.00	0.00	0.00	0.00	0.00	0.00
Australia	0.00	0.00	0.00	0.00	0.00	0.00
India	0.00	0.00	1.43	136.28	1.43	−15.84
New Zealand	0.00	0.00	0.00	0.00	0.00	0.00
ASEAN+6	0.00	0.00	95.43	91.14	95.43	−24.86
ASEAN+3	0.00	0.00	94.00	92.46	94.00	−26.24

Lao PDR = Lao People's Democratic Republic, PRC = People's Republic of China.
Note: The regional average tariff rate from 1992 to 2009 is 10.16%. The sample includes all economies, except Brunei Darussalam and Myanmar. ASEAN+3 comprise the ASEAN economies (except Brunei Darussalam and Cambodia), the People's Republic of China, Japan, and the Republic of Korea. ASEAN+6 comprise the ASEAN+3 economies, together with Australia, India, and New Zealand. Export (import) gain is the difference between simulated export (import) and the baseline export (import). Imports of Lao PDR from another country are treated as exports of that country to Lao PDR. Baseline refers to the bilateral trade flows of the estimated model based on the average actual data from 1992 to 2009 of the explanatory variables. Trade balance is defined as the difference between export gain and import gain which is also the difference between simulated and baseline trade balances. A positive percentage change in the trade balance means a deteriorating balance, while a negative percentage change denotes an improvement. The root mean squared error (RMSE), which represents the difference between the actual observations and the model predicted values, is 14%.

Source: Authors' estimations.

Table 6. Trade Gains of Lao PDR—Reduction of Each Country Tariff Rate by Half

Country	Import Gain ($ million)	%	Export Gain ($ million)	%	Trade Balance ($ million)	%
Cambodia	1.37	53.11	0.00	0.00	−1.37	53.11
Indonesia	3.69	53.62	0.52	36.95	−3.17	57.92
Malaysia	3.99	53.62	0.61	44.66	−3.38	55.63
Philippines	1.09	53.63	0.07	25.56	−1.02	57.85
Singapore	11.17	53.69	0.00	0.07	−11.17	57.34
Thailand	113.17	53.38	31.50	103.61	−81.67	44.97
Viet Nam	27.97	53.59	43.07	109.60	15.10	−117.06
PRC	54.62	54.08	24.17	176.41	−30.45	34.88
Japan	17.56	53.36	3.05	21.95	−14.51	76.35
Korea, Republic of	11.82	53.71	0.00	0.00	−11.82	53.71
Australia	9.00	53.55	0.34	21.61	−8.66	56.84
India	5.35	52.97	1.48	140.96	−3.87	42.75
New Zealand	0.98	53.54	0.08	19.54	−0.90	63.67
ASEAN+6	261.78	53.58	104.89	100.17	−156.88	40.87
ASEAN+3	246.45	53.59	102.99	101.30	−143.46	40.05

Lao PDR = Lao People's Democratic Republic, PRC = People's Republic of China.
Note: *See* Table 5. RMSE is 17%. ASEAN+3 comprise the ASEAN economies (except Brunei Darussalam and Cambodia), the People's Republic of China, Japan, and the Republic of Korea. ASEAN+6 comprise the ASEAN+3 economies, together with Australia, India, and New Zealand.

Source: Authors' estimations.

### Table 7. Trade Gains of Lao PDR—Complete Elimination of Tariff Rates

Country	Import Gain ($ million)	%	Export Gain ($ million)	%	Trade Balance ($ million)	%
Cambodia	3.48	134.44	0.00	0.00	−3.48	134.44
Indonesia	9.36	135.99	1.24	87.65	−8.12	148.46
Malaysia	10.12	135.98	1.49	109.26	−8.63	141.98
Philippines	2.76	136.04	0.15	57.72	−2.61	147.78
Singapore	28.30	136.05	0.00	0.14	−28.30	145.32
Thailand	287.51	135.62	95.56	314.34	−191.95	105.70
Viet Nam	70.94	135.90	133.28	339.13	62.34	−483.24
PRC	138.07	136.71	123.56	901.91	−14.51	16.62
Japan	44.59	135.54	6.84	49.23	−37.75	198.68
Korea, Republic of	29.95	136.14	0.00	0.00	−29.95	136.14
Australia	22.83	135.88	0.76	48.07	−22.07	144.95
India	13.63	134.92	5.06	480.62	−8.57	94.73
New Zealand	2.48	135.75	0.18	42.97	−2.30	163.37
ASEAN+6	664.02	135.91	368.12	351.55	−295.90	77.09
ASEAN+3	625.09	135.93	362.13	356.18	−262.96	73.42

Lao PDR = Lao People's Democratic Republic, PRC = People's Republic of China.
Note: See Table 5. RMSE is 57%. ASEAN+3 comprise the ASEAN economies (except Brunei Darussalam and Cambodia), the People's Republic of China, Japan, and the Republic of Korea. ASEAN+6 comprise the ASEAN+3 economies, together with Australia, India, and New Zealand.

Source: Authors' estimations.

Figure 1. Lao PDR's Merchandise Trade (Exports and Imports), 1990–2012 ($ billion)
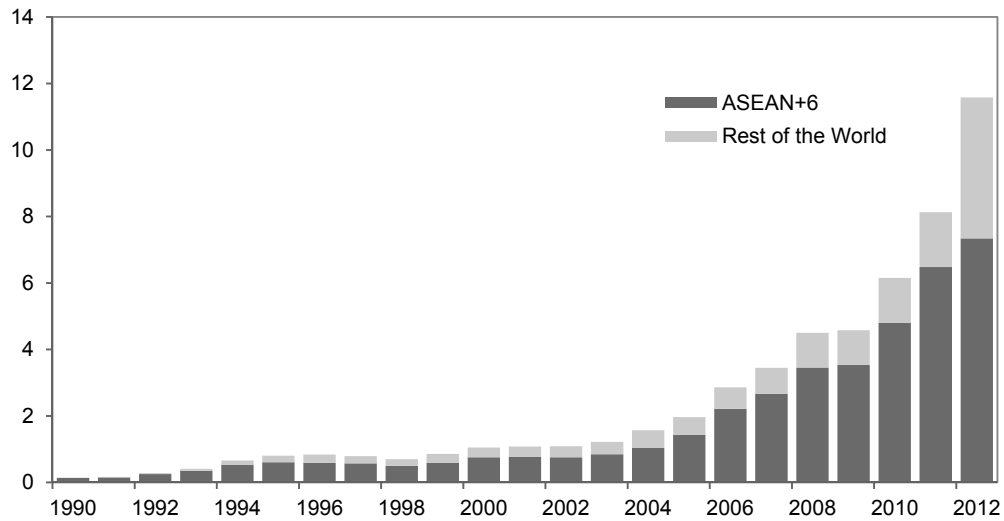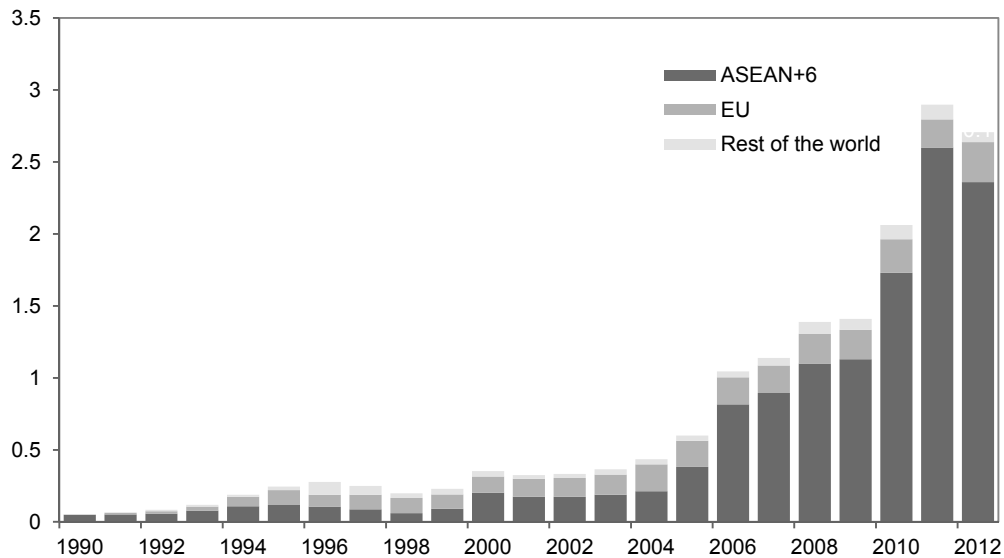

Lao PDR = Lao People's Democratic Republic.

Note: ASEAN+6 are the 10 ASEAN economies (Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Viet Nam) plus the People's Republic of China, Japan, the Republic of Korea, Australia, India, and New Zealand.

Source: Authors' compilation based on UNComtrade data.

Figure 2. Lao PDR's Exports by Destination, 1990–2012 ($ billion)

EU = European Union, Lao PDR = Lao People's Democratic Republic.

Note: ASEAN+6 are the 10 ASEAN economies (Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Viet Nam) plus the People's Republic of China, Japan, the Republic of Korea, Australia, India, and New Zealand.

Source: Authors' compilation based on UNComtrade data.

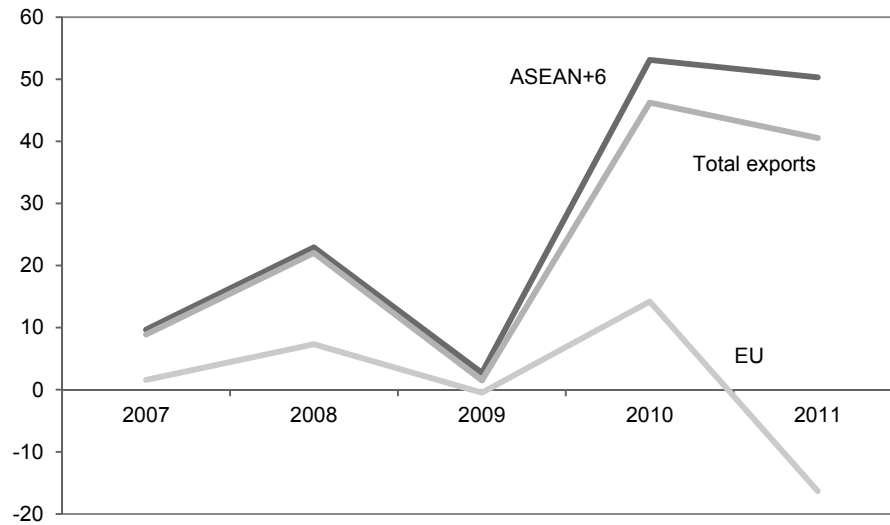**Figure 3. Lao PDR's Exports to Major Trading Partners (Annual Growth), 2007–2011** (%)
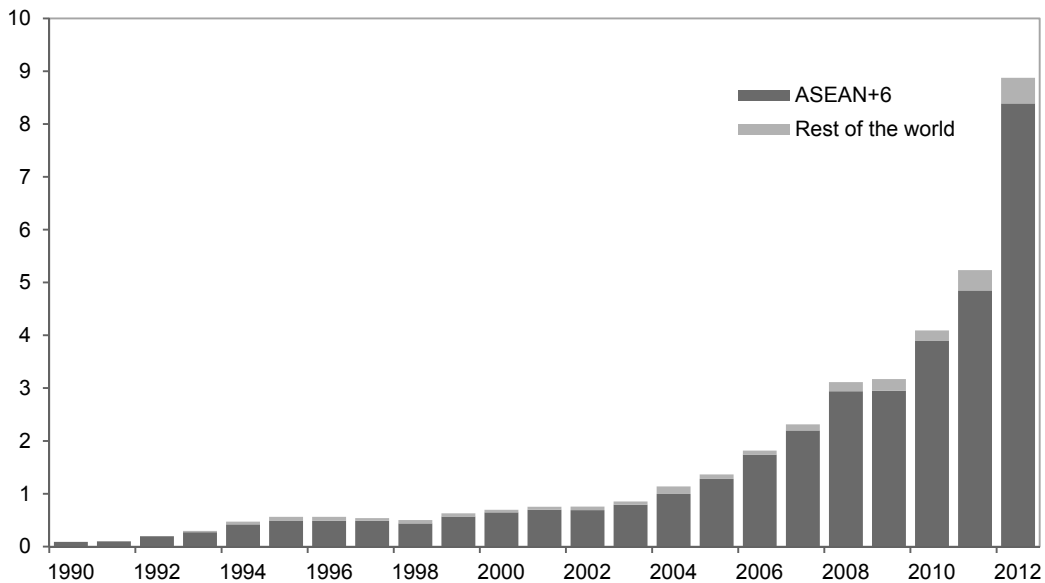

EU = European Union, Lao PDR = Lao People's Democratic Republic.

Note: ASEAN+6 are the 10 ASEAN economies (Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Viet Nam) plus the People's Republic of China, Japan, the Republic of Korea, Australia, India, and New Zealand.

Source: Authors' compilation based on UNComtrade data.

Figure 4: Lao PDR's Imports by Source Country, 1990–2012 ($ billion)
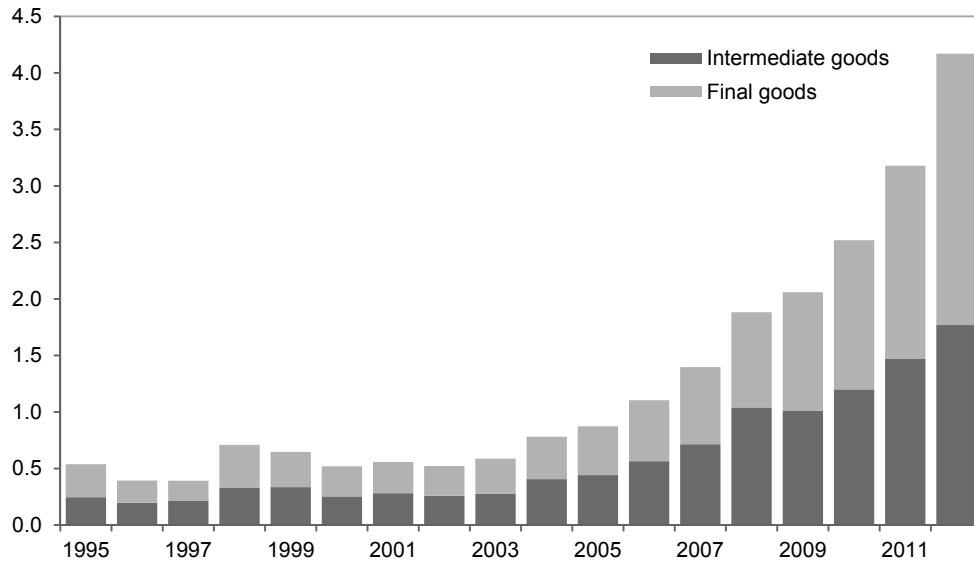

Lao PDR = Lao People's Democratic Republic.

Note: ASEAN+6 are the 10 ASEAN economies (Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Viet Nam) plus the People's Republic of China, Japan, the Republic of Korea, Australia, India, and New Zealand.

Source: Authors' compilation based on UNComtrade data.

Figure 5. Lao PDR's Imports by Type of Goods, 1995–2011 ($ billion)

Lao PDR = Lao People's Democratic Republic.

Source: Authors' compilation based on UNComtrade data.

Figure 6. Average Tariff Rates in ASEAN+6, 1992–2009 (%)

Lao PDR = Lao People's Democratic Republic, PRC = People's Republic of China.

Note: ASEAN+6 are the 10 ASEAN economies (Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Viet Nam) plus the People's Republic of China, Japan, the Republic of Korea, Australia, India, and New Zealand.

Source: Authors' calculation.

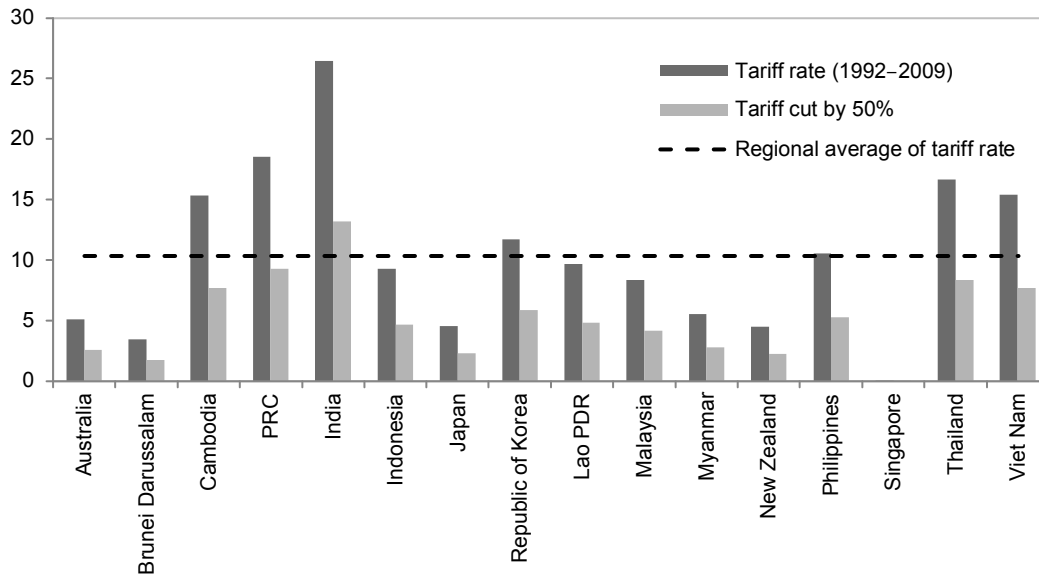## Appendix 1. Variable Definition and Data Source

Variable	Definition	Source
$\ln X_{ijt}$	Real bilateral exports of country i to country j for year t converted to logarithm.	*Direction of Trade Statistics,* the International Monetary Fund (IMF) and United Nations Commodity Trade Statistics (UNComtrade)
$LGDPT_{ijt}$	Sum of bilateral country size is defined by the sum of GDP in country i and country j for year t. Converted to logarithm.	*World Economic Outlook* (WEO), IMF
$LSIM_{ijt}$	Similarity in bilateral country size is defined by one minus the squares of the relative size (GDP) of country i (country j) to bilateral GDP for year t. Converted to logarithm.	WEO, IMF
$LDIST_{ijt}$	Distance is the geographical distance between the capitals of country i and country j, measured in kilometers. Converted to logarithm.	*Centre d'Etudes Prospectives et d'Informations Internationales*
$LdGDP_{ijt}$	Differences in relative factor endowment are defined by the absolute value of the differences in the logarithm in GDP per capita between country i and country j for year t.	WEO, IMF; International Financial Statistics, IMF
Tar_{ijt}	Tariff rate is the simple average of tariff rates for most favored nation, applied to imports of country i from country j for year t.	*World Development Indicators,* World Bank

Source: Authors' compilation.

Appendix 2. Summary Statistics

Variable	Mean	Std. Dev.	Min	Max
$\ln X_{ijt}$	19.73	3.10	8.94	25.33
$LGDPT_{ijt}$	27.11	1.39	22.39	29.71
$LSIM_{ijt}$	−2.10	1.41	−7.35	−0.69
$LDIST_{ijt}$	8.16	0.76	5.75	9.45
$LdGDP_{ijt}$	2.10	1.44	0.00	6.17
Tar_{ijt}	10.16	8.71	0.00	55.84

Note: Summary statistics are calculated using data from ASEAN+6 countries over the period 1992–2009. The dataset consists of 2442 observations with 237 country pairs. ASEAN+6 are the 10 ASEAN economies (Brunei Darussalam, Cambodia, Indonesia, the Lao People's Democratic Republic, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Viet Nam) plus the People's Republic of China, Japan, the Republic of Korea, Australia, India, and New Zealand.

Source: Authors' calculations.

Appendix 3. Correlation Matrix

	$\ln X_{ijt}$	$LGDPT_{ijt}$	$LSIM_{ijt}$	$LDIST_{ijt}$	$LdGDP_{ijt}$	Tar_{ijt}
$\ln X_{ijt}$	1.00					
$LGDPT_{ijt}$	0.59	1.00				
$LSIM_{ijt}$	0.34	−0.34	1.00			
$LDIST_{ijt}$	0.00	0.33	−0.03	1.00		
$LdGDP_{ijt}$	−0.21	0.04	−0.19	0.16	1.00	
Tar_{ijt}	−0.07	−0.04	0.04	−0.09	−0.05	1.00

Note: Correlation matrix is calculated using data from ASEAN+6 countries over the period 1992–2009. The dataset consists of 2442 observations with 237 country pairs. ASEAN+6 are the 10 ASEAN economies (Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Viet Nam) plus the People's Republic of China, Japan, the Republic of Korea, Australia, India, and New Zealand.

Source: Authors' calculations.

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Assessing the trade impacts of the ASEAN +6 FTA
the case of Lao People's Democratic Republic

Using an unbalanced panel dataset of bilateral exports from 1992 to 2009, this paper assesses the potential trade impacts of the expansion of the Association of Southeast Asian Nations (ASEAN) to ASEAN+3 and ASEAN+6 on the Lao People's Democratic Republic. It finds that bilateral exports are positively related to the overall bilateral country size and similarity in country size, but inversely related to the relative factor endowment differences, transportation costs, and import tariffs.

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