

**How Can Evaluate
the Myanmar's Current Trade Structure and Flow?**

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Abstract

The improvement of bilateral trade between countries is useful for economic growth and to fulfil people's needs at the same time. Bilateral trade raises income levels and benefits for both countries. This paper examines the trade structure between Myanmar and some trade partner countries by applying the standard gravity model using panel data. Using the gravity model of international trade theory intends to explain the bilateral trade flows and patterns between two economies. The gravity model can explain Myanmar's trade structure and flow completely with the outcomes in the model. GDP is active factor in evaluating Myanmar's trade structure. The positive and significant coefficient of the TCI implies that a Heckscher–Ohlin presumption could be appropriate in explaining trade patterns. Trade flows are significantly dependent on the inter-industry trade that comes from factor endowment difference. Foreign exchange rate instability might be serious effects on trade sector development and the nation's trade value. In the past, bilateral trade between Myanmar and Western countries was quite weak, although neighboring countries are the most important trade partners for Myanmar. ASEAN countries trade far less with Myanmar and ASEAN dummy shows that Myanmar still needs to tie itself closer to ASEAN for trade improvement. The random effects model (REM) and Hausman test results show the verification of the empirical model.

Keywords: trade structure, standard gravity model, bilateral trade, GDP, TCI

I. Introduction

In developing countries, trade can be seen as the backbone of their economies and can expand markets from local to global. Growing bilateral trade raises income levels and benefits both countries financially. Furthermore, trade allows businesses in developing countries to access the technologies essential for improving their productivity and competitiveness. Today's world trade is wider and stronger than ever before.

Myanmar is located on mainland Southeast Asia and its geographical location makes Myanmar as a vast potential market and a sub-regional economic nodal link between regions. Myanmar can try to strengthen its economy through ASEAN and utilizing its singular

geographic position as a link between South and Southeast Asia, a position which favours taking on new opportunities. As ASEAN becomes one of the fastest-growing economies in the world, the integration between ASEAN member countries grows stronger, and it continues to out-perform the rest of the global economy. Stronger ties with other ASEAN member countries may be needed. Moreover, the establishment of the ASEAN Economic Community (AEC) in 2015 was a major high point in the regional economic incorporation agenda. To harmonize with the principles of transparency, simplicity, efficiency and consistency of integration with the ASEAN Single Window (ASW), Myanmar has been implementing its own National Single Window (NSW). In the future, Myanmar's trade potential may improve not only with ASEAN partners, but also globally, thereby enhancing Myanmar's role as a trading partner.

Thailand is still the primary trading partner for Myanmar, alongside China and India. The higher the degree of complementary trade, the larger the differences in factor endowment and trade flow increase. For a long time, the US and Western trade sanctions weakened the ability of the Myanmar economy to be competitive in the global market. One important fact is that Myanmar has always imported more than it exports. The intent was not only to make Myanmar's exports more competitive on world markets, but also to reduce the tax component in export prices. The Myanmar government strived to promote trade by making major policy changes in the trade sector, and all exports, besides a few specific goods, became free from commercial tax (Myanmar Investment Guide, 2014).

The objectives of the study are to understand Myanmar's trade potential and complementary trade in future. This can be done by testing its trade flows empirically and

comparing them with twenty other trade partners during the period of 2000 to 2018 – nineteen years in all – and considering the following questions: How can evaluate the Myanmar’s trade pattern be solved using the trade conformity index (TCI)? And find out ASEAN’s role in Myanmar’s trade sector development. Myanmar’s trade structure and flow estimates can be analysed by applying the standard gravity model to panel data. There are four sections to consider: the theoretical framework and perspectives of some previous literature, a look at empirical methodology, a description of the data, and finally a discussion of empirical results, leading to this study’s main findings and remarks.

II. Theoretical Framework and Previous Literature Perspectives

The use of the gravity model of international trade theory intends to explain the bilateral trade flows and patterns between two economies. The basic concept of the gravity model developed by using Tinbergen (1962) examining the bilateral trade patterns means that exports and import from one country to another can be explained by their economic size (GDP or GNP) and the geographical distance between the countries.

Deardorff (1998), and Evenett and Keller (1998) found the Heckscher–Ohlin model perspective to be consistent with the gravity equations and pointed out that the standard gravity equation can be obtained from the Heckscher–Ohlin model with both perfect and imperfect product specializations. Sohn (2001, 2005) identified that South Korea's trade flows could follow a Heckscher–Ohlin model. Although international trade theories attempt to explain a country’s trade flow, an empirical analysis of focused models may generate different results.

The distance between partners is inversely related to the degree of bilateral trade. To test this hypothesis, researchers Nguyen (2009), Nuroglu and Dreca (2011), and Walsh (2008) use the Hausman test, while other researchers like Keying Keum(2008) use the Linder hypothesis. Nuroglu and Dreca (2011) analysed the total trade flow by applying a modified gravity model. Hout & Kakinaka (2007) analysed trade structure and trade flow by focusing on the basic gravity model of GDP, per capita GDP, and distance, as well as a standard gravity model of trade conformity index, exchange rate volatility and the ASEAN dummy.

Hout & Kakinaka (2007) and Arabi and Ibrahim (2012) findings show that the positive and significant coefficient on the TCI implies that a Heckscher–Ohlin approach could be useful in explaining trade patterns. Trade flows are significantly dependent on inter-industry trade, which comes from differences in factor endowment and monopolistic competition.

Aung (2009) analysed the structure of Myanmar's exports and the implications for economic development, incorporating the gravity model of trade. The author divided his study into two parts; the regional integration and bilateral trade flow of ASEAN members plus China, India, Korea and Japan and Myanmar's trade structure based on the core gravity model variables plus three dummy variables: neighbouring nations, domestic crisis, and regional financial crisis. The empirical results showed that Myanmar mainly trades with neighbouring countries, and that political unrest has a strong effect on Myanmar's trade structure.

Lwin (2009) points out that the trade patterns of Cambodia, Laos and Myanmar (CLM), and this analysis mainly intends to identify the determining factors of each country's bilateral trade flows and policy implication for promoting trade. When analyzing bilateral trade in

Myanmar, one important dummy variable, sanction is used as an extra variable in the model to examine the impact of trade sanctions. Myanmar's actual trade volume is lower than its trade potential with many Asian trading partner countries.

Kubo (2014) applied the gravity model to Myanmar's non-natural resources export potential after the lifting of economic sanctions. The analysis of the effect of economic sanctions on bilateral trade flows, using a dummy variable shows that Myanmar's actual export of non-resource goods during 2005-2010 was one-fifth of its potential, implying that exporting to neighbouring countries failed to compensate for export losses to Western sanctions.

In this study, the main focus was on the standard gravity model as applied to Myanmar and its partner countries' real GDP, and the bilateral trade flow between them. TCI was calculated based on one year's import/export market share between Myanmar and its partner countries. Like Nguyen (2009), Nuroglu and Dreca (2011) and Walsh (2008), the Hausman-Taylor test was used. However, the precedent of Keying Keum (2010) was followed and the Linder hypothesis was incorporated. However, some researchers neglect hypothesis testing in their gravity model of trade analysis.

III. Empirical Methodology

Many empirical studies and analyses of international trade have accepted that the gravity equation is linked to a number of models, including the Ricardian, the Heckscher–Ohlin, and the monopolistic competition models. It is at the heart of any model of trade (Kimura & Lee, 2006). There is a related data set consisting of the total trade flow among Myanmar and 15of

its trade partner countries. Export and import values act as dependent variables, while independent variables consist of Myanmar's GDP, its partner countries' GDP, Myanmar GDP times with partner country's GDP and the distance between Myanmar and its partner countries. These variables serve as an approximation for economic size and purchasing power of the two economies, and bilateral trade volume will rise when a country's GDP and per capita GDP increase. Moreover, the distance between Myanmar and its partner countries is taken as a proxy for the cost of trade, which reflects various trade resistance factors like market access barriers, transportation costs, and delivery time.

To analyse the peculiarities of Myanmar's trade patterns, three new variables are the ASEAN trade network, exchange rate volatility, and the trade complementarity index (TCI). TCI can measure the degree of complementary trade between two countries and reflect different factor endowments, which is in line with the Heckscher-Olin model. In previous studies about Myanmar's trade structure, TCI was not used as a single variable. Concerning exchange rate volatility, every economy is still influenced by the exchange rate between local currency and the US dollar. VOL is an explanatory variable and calculate the exchange rate volatility between the US dollar and the partner country's currency. Exchange rate fluctuation between countries is an essential monitor for trade as it allows trade, discourages risk, and covers the risk of profit uncertainty related to international transactions. Since regional trade cooperation is important in determining Myanmar's trade flows, including ASEAN as a dummy variable sets a standard which will be set to unity if the country is a member of ASEAN, and zero otherwise. The empirical gravity equation used combines the basic gravity

model with the standard gravity model, plus three new variables. The standard gravity model could be analysed with

$$\ln T_{ij} = \beta_0 + \beta_1 \ln Y_i + \beta_2 \ln Y_j + \beta_3 \ln D_{ij} + \beta_4 TCI_{ij} + \beta_5 VOL_j + \beta_6 ASEAN_{ij} \varepsilon_{it}$$

In these equations, T_{ijt} , denote total trade value, between Myanmar and Country J. Y_i and Y_j indicate the GDP of Myanmar and Country J, respectively. D_{ij} refers to the distance between Myanmar and Country J. $ASEAN_{ij}$ is a dummy variable; it will be set to unity if Country J belongs to ASEAN, and zero otherwise. VOL_j indicates the volatility of the nominal exchange rate between the US dollar and Country J's currency. TCI_{ij} is the trade conformity index, or measure of trade complementarities between bilateral trade. ε_{it} is an error term, while β_1 , β_2 , β_3 , β_4 , β_5 , and β_6 are coefficients.

With reliable empirical methodology, a random effects model is appropriate, though many researchers only use two methods for estimating unobserved effects from panel data models. The fixed effects estimator uses a transformation to remove the unobserved effect α_i before estimation. The random effects estimator is attractive when the unobserved effect is uncorrelated with all the explanatory variables. (Wooldridge, 2013, p. 466).

IV. Data Description

The pooled OLS estimation uses panel data to test the empirical gravity equation and covers a period from 2000 to 2018, totaling 19 years. It investigates Myanmar's trade structure and trade flow by comparing the 15 trading partner countries, including 11 Asian countries and 3 Western countries and Brazil. Data related to Myanmar was gathered from international organizations such as the International Monetary Fund (IMF), which issued data

called International Financial Statistics (IFS) and Direction of Trade Statistics (DOTS) in the IMF World Economic Outlook Database (2019, April). Other data sources were the International Trade Statistics of International Trade Center (UNCTAD), The International Trade Centre of Trade Statistics for International Business Development (Trade Map), and distances were found from <https://www.distancefromto.net/>.

Distance measured in kilometers (km). The distance between countries measured is from Myanmar's capital city, Naypyidaw, to each partner country's capital city. Trade data is computed as total trade value, with export value and import value shown separately by dollar millions. GDP show the current price term calculated by Purchasing power parity (PPP) measured by international dollar (billions). Exchange rate volatility is calculated from the partner countries' exchange rate volatility by computing the standard deviation for each country based on US dollar per domestic currency. ASEAN dummy variable is used in this study as a measure of unity if the partner country is also an ASEAN member, and otherwise it is considered to be zero. TCI measures the degree of trade complementarity or competitiveness between two countries. The higher the degree of trade complementarity, the larger the differences in factor endowment and trade flow increase, The TCI ranged from zero to one; one means in which Myanmar's export share is related to its partner countries' import share, and Myanmar has an equal trade share against its partner countries. Where TCI equals zero, Myanmar's export share is smaller than its partner country's import share, and Myanmar does not have a perfectly fair-trade share against its partner country. Myanmar and its partner countries' bilateral trade in 2018 is a uniform commodity group of 85 electrical and electronic equipment products. (Trade Map). Sohn (2005) explains that the estimate of

the coefficient becomes positive when trade volume increases with the rising trade complementarities; this is precisely what is represented by the Heckscher–Ohlin trade model of inter-industry trade. On the other hand, the coefficient becomes negative when the trade volume increases with the falling trade complementarities.

Table 4.1 Data description

Variables	Unit	N	Mean	Max	Min	Std. Dev.
Total Trade Value	USD (mil)	285	950.48	12681	0.02	1784.58
Export Value	USD (mil)	285	460.14	5456	0.01	929.72
Import Value	USD (mil)	285	490.34	7225	0.00	992.05
Myanmar GDP	USD (bil)	285	182.21	344	55.81	89.2
Partner Countries' GDP	USD (bil)	285	5945.36	30859	165.86	6339.5
Myanmar and Partner Countries GDPs	USD (bil)	285	25099	100345	262.16	22090
Distance	km	285	5757.31	16196	820	4727.96
ASEAN Dummy		285	0.33	1	0	0.47
Trade Conformity Index		285	0.07	0.59	0	0.17
Exchange Rate Volatility		285	0.06	1	0	0.16

Sources: International Monetary Fund: Direction of Trade Statistics, World Economic Outlook Database 2019 April, International Trade Statistics of International Trade Center, <https://www.distancefromto.net>.

V. Empirical Results, Discussion, and Hypothesis Testing

This study solves the basic gravity model and the standard gravity model. Panel data analysis allows more variability and reduces the multicollinearity between variables and some time-invariant factors characterized by trading partners affecting Myanmar's trade

structure and trade flow. Three empirical equations are used to prove the model's accuracy: total trade, export value, and import value. OLS estimation and random effect estimation are shown separately. The Hausman test is the best statistical test to decide whether the fixed or random effect model is appropriate for all empirical models of gravity analysis. The results indicate that the random effect model is appropriate.

Table 5.1 Basic Gravity Model (Random Effect)

Dependent variables: total trade value, export value and import value

Variables	Total Trade Ln (Tot)	Export Ln (Ex)	Import Ln (Im)
Constant	11.93*** (2.97)	12.9*** (2.82)	9.76* (1.92)
Distance	-1.66*** (-3.87)	-1.88*** (-3.9)	-1.58*** (-2.87)
Myanmar GDP	0.86*** (5.4)	0.8*** (4.22)	1.12*** (6.41)
Partner countries' GDP	0.36 (1.48)	0.36 (1.3)	0.28 (0.99)
F-Statistics	47.52***	29.1***	73.13***
Adjusted R-Squared	0.33	0.23	0.43
No. Of Observations	285	285	283

Note: *, **, and *** denote statistical significance within 10%, 5%, and 1% respectively. Numbers in parentheses are t-statistics.

Table 5.1 points out the random effect result for three explained variables as basic gravity model. The coefficient of Myanmar's GDP and distance between partner count can explained Myanmar trade structure but partner countries' GDP directly related but insignificant in all estimations. Distance is inversely related and statistically significant with 1% and follows the previous researchers' outcome. Myanmar's GDP displays the robust evidence of GDP to describe Myanmar trade structure with basic gravity as well match with other previous studies.

Table 5.2 Standard Gravity Model (OLS Estimation)

Variables	Total Trade Ln (Tot)	Export Ln (Ex)	Import Ln (Im)
Constant	18.12*** (12.64)	22.69*** (14.63)	11.4*** (6.53)
Distance	-2.17 *** (-15.62)	-2.72*** (-18.08)	-1.76*** (-10.31)
Myanmar GDP	0.98*** (6.36)	0.96*** (5.75)	1.13*** (5.94)
Partner countries' GDP	0.1 (1.44)	0.009 (0.13)	0.27*** (3.28)
Trade Conformity Index (TCI)	1.62** (2.45)	-2.38*** (-3.33)	1.31 (1.63)
E.R. Volatility	-0.62 (-0.92)	-1.05 (-1.44)	0.09 (0.11)
ASEAN Dummy	-1.5*** (-6.36)	-2.44*** (-9.64)	-0.7** (-2.46)
F-Statistics	70.07***	83.7***	42.33***
Adjusted R-Squared	0.59	0.64	0.47
No. Of Observations	285	285	283

Note: *, **, and *** denote statistical significance within 10%, 5%, and 1% respectively. Numbers in parentheses are t-statistics.

Table 5.2 and 5.3 show that the OLS estimation result and random effect result of standard gravity model. The larger the distance between the countries, the lesser the trade value between those two countries and this finding harmonizes with the previous gravity model concept of trade. The coefficient of Myanmar's GDP positive related to both two types of estimations; OLS estimation and random effect. The greater the GDP of Myanmar increases, the total trade value will also increase. Partner countries' GDP directly related to import meaning that the greater the size of their GDP, the larger their import.

The trade conformity index (TCI) is one core variable for this analysis and insignificant in estimation of the impact on total trade and export even though the signs of coefficient are different. Sohn (2005) showed that if the estimate of the coefficient is positive and greater

than zero, trade volume increases with the rising trade complementarities. The coefficient becomes negative when the trade volume increases with the falling trade complementarities. The TCI shows Myanmar's inter-industry trade following the Heckscher–Ohlin model of comparative advantages of factor endowment differences between nations. However, the outcomes are insignificant in random effect estimation. The exchange rate volatility variable is inversely related and can explain the impact on total trade value and import.

Table 5.3 Standard Gravity Model (Random Effect)

Variables	Total Trade Ln (Tot)	Export Ln (Ex)	Import Ln (Im)
Constant	16.57*** (3.16)	21.36*** (4.43)	10.63 (1.42)
Distance	-2.22*** (-3.8)	-2.8*** (-5.22)	-1.73** (-2.06)
Myanmar GDP	0.76*** (4.5)	0.78*** (4.32)	0.99*** (5.13)
Partner countries' GDP	0.5* (1.97)	0.37 (1.51)	0.44 (1.41)
Trade Conformity Index (TCI)	1.14 (0.51)	-0.5 (-0.81)	1.79 (0.56)
E.R. Volatility	-0.81* (-1.67)	1.5 (0.73)	-1.11** (2.43)
ASEAN Dummy	-1.83* (-1.84)	-2.74*** (-3)	-0.87 (-0.61)
F-Statistics	25***	17.6***	38.08***
Adjusted R-Squared	0.34	0.26	0.44
No. Of Observations	285	285	283

Note: *, **, and *** denote statistical significance within 10%, 5%, and 1% respectively. Numbers in parentheses are t-statistics.

The exchange volatility of partner countries is based solely on those countries' exchange rates with the US dollar only. Although Myanmar is active participation in ASEAN, ASEAN dummy is inversely related to trade structure. The reason might be only

ASEAN five countries included in this analysis and only Thailand and Singapore are top trading partner for Myanmar in this region.

VI. Conclusion and Finding

Based on this study's empirical result, the basic gravity model can explain Myanmar's trade structure and flow completely with the outcomes in the model. Like Sohn (2005), Hout & Kakinaka (2007), and Arabi, K. & Ibrahim (2012), the positive and significant coefficient of the TCI implies that a Heckscher–Ohlin presumption could be appropriate in explaining trade patterns. Trade flows are significantly dependent on the inter-industry trade that comes from factor endowment difference. As Myanmar's economy is mainly based on natural resource exports, that means that Myanmar needs to promote trade competitiveness on the world market. Foreign exchange rate instability has had serious effects on trade sector development and the nation's trade value. In the past, bilateral trade between Myanmar and Western countries was quite weak, although neighboring countries are the most important trade partners for Myanmar. For a long time, the United States of America's sanctions on Myanmar affected the economy and likely prevented trade sector development and trade flow. Previous researchers didn't use the trade conformity index (TCI) when analyzing Myanmar's trade structure. ASEAN countries trade far less with Myanmar and ASEAN dummy shows that Myanmar still needs to tie itself closer to ASEAN for trade improvement. Partner counties' exchange rate volatility has a negative effect on total trade and imports, but does not affect exports. Myanmar's level of trade performance is still lower than other ASEAN member countries and neighboring countries. FEM does not allow for estimating time-invariant variables. However, REM has the advantage of handling these kinds of

explanatory variables and matches with this analysis and the Hausman test matches with this analysis. Although some results were shown as statistically insignificant, the standard gravity model can completely explain the trade structure and flow of Myanmar.

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