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Myanmar's Non-Resource Export Potential after the Lifting of Economic Sanctions: A Gravity Model Analysis

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Abstract

Easing of economic sanctions by Western countries in 2012 augmented the prospect that Myanmar will expand its exports. On the other hand, a sharp rise in natural resource exports during the sanctions brings in a concern about the "Dutch disease". This study projects Myanmar's export potential by calculating counterfactual export values with an augmented gravity model that takes into account the effects of natural resource exports on non-resource exports. Without taking into account the effects of natural resource exports, the counterfactual predicted values of non-resource exports during 2004–2011 are more than five times larger than the actual exports. If we take into account the effects, however, the predicted values are smaller than the actual exports. The empirical results imply that the "Dutch disease" is at stake in Myanmar than any other Southeast Asian countries.

Keywords: Myanmar, Economic sanctions, Gravity model, Dutch disease

JEL classification: F14, F17, F51, O53

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I. Introduction

During the 2000s, the United States, Canada, and the European Union (EU) imposed general or specific import bans on Myanmar goods in response to actions by the country's ruling junta. The tightening of U.S. sanctions in July 2003 hit Myanmar's apparel industry especially hard. In 2002, Myanmar's apparel exports to the United States were USD 318.8 million, 11.3% of total exports; in 2004, exports dropped to zero.[1] The subsequent stagnant performance of Myanmar's exports might be partially associated with the economic sanctions. Following efforts by President Thein Sein's government to reconcile with the democratization movement, the above-mentioned Western countries lifted most of their sanctions by the end of 2012, which enhances Myanmar's prospects to expand its exports.

On the other hand, the tight economic sanctions coincided with a rise in Myanmar's exports of natural resources. Full-scale production and exports of natural gas were achieved by 2002. Since then, natural gas has been the largest export item; it accounted for 5.4% of total exports in 2000, and 48.8% in 2008. Defining the natural resource exports as the sum of goods categorized in Standard International Trade Classification (SITC) code 2 (crude materials and inedible, except fuels) and 3 (mineral fuels, lubricants, and related materials), the share of the natural resource exports jumped from

[1] Kudo (2008) provides an anecdotal account about the impact of US sanctions on Myanmar's apparel industry.

31.8% in 2000 to 69.4% in 2008.

Such a sharp rise in resource exports brings in a concern about the “Dutch disease” effects. Natural resource exports could exert adverse effects on the competitiveness of non-resource exports by a real appreciation of the local currency and by movements of labour and capital to the resource and non-tradable sectors (Corden, 1984). On the assumption that the non-resource sector has positive externalities on the productivity of the economy, its slower growth due to the “Dutch disease” effects would reduce the economic growth rate.

A point at issue is whether Myanmar can follow the economic growth path of Indonesia, Malaysia and Thailand who managed to achieve economic diversification and high GDP growth regardless of their resource abundance. According to Gylfason (2001) and van der Ploeg (2011), the high growth of these Asian countries is rather exceptional cases as the bulk of resource rich developing countries had only modest growth rates. In addition, the emergence of China in the global economy as a large supplier of labour-intensive manufactured goods and a large consumer of natural resources might have affected the comparative advantage of Myanmar and other Southeast Asian countries (Coxhead 2007). It is an important policy issue whether Myanmar’s resource abundance leads to its resource dependence or not.

Against this backdrop, this study projects Myanmar’s export potential of non-resource goods. Myanmar’s per capita exports have remained the lowest among members of the Association of Southeast Asian Nations (ASEAN) in the past two decades. Per capita exports of goods and services in 2010 were USD 159, less than half the USD 359 reported for the Lao People’s Democratic Republic (Lao PDR). Furthermore, Myanmar’s exports have been concentrated in natural resources such as

natural gas. Taking it into account the possible adverse effects of resource exports, this paper predicts Myanmar's potential of non-resource exports after the lifting of economic sanctions.

This study measures the trade potential with the theoretically predicted trade value by an augmented gravity model. The counterfactual export values of the sanction period are estimated with a gravity model, using the data of 10 neighbouring countries in South and Southeast Asia. A novel feature of the present study is the use of an augmented gravity model that takes into account, if any, the "Dutch disease" effects of natural resource exports on non-resource exports. In addition to the prediction of Myanmar's export performance, this allows us to examine the extent of the "Dutch disease" effects in Asian economies.

The remainder of this study is structured as follows. Section II presents the brief history of economic sanctions against Myanmar and the composition of exports by destination and commodity during the sanctions. Section III reviews the literature of trade analyses that employ gravity models, focusing on studies of economic sanctions and projections of trade potential. Section IV illustrates the study's empirical methods and summarises its results. It also draws policy implications promoting non-resource exports. Section V concludes.

II. Sanctions and trade structure in Myanmar

Western countries initiated sanctions against Myanmar (Burma) after its suppression of anti-government protest and the subsequent establishment of a junta in August 1988.

The United States imposed the most severe sanctions, followed by Canada and the EU.[2] The sanctioning governments enjoined their citizens and corporations from engaging in specific economic activities with Myanmar. The United States and Canada imposed general import bans on Myanmar goods in July 2003 and December 2007, respectively. In February 2008, the EU enacted the specific import bans of timber and timber products, coal and metals, and precious and semi-precious stones.

After inauguration of the new government, led by President Thein Sein in April 2011, the West began to ease its economic sanctions. In April 2012, Canada announced the lifting of general import ban. In May 2012, the EU also suspended sanctions. In November 2012, the U.S. Departments of State and Treasury announced a waiver of the ban on imported Myanmar goods except jadeites and rubies. Thus, the preponderance of sanctions was lifted by the end of 2012.

Let us trace the impacts of economic sanctions on Myanmar's exports. Figure 1 summarises the trend of exports for the period 2000-2012. The total exports exhibit an increasing trend, which is largely owing to natural gas exports to Thailand. In contrast, the exports of apparel, whose main destination had been the United States, stagnated in the 2000s. As a result, the proportion of natural gas exports to total exports increased from 5.4% in 2000 to nearly a half in 2008, while the proportion of apparel exports declined from 42.0 % to 8.1% in the same period.

Figure 1

[2] Australia imposed an arms embargo against Myanmar but never implemented general trade and investment sanctions.

A comparison of destinations for Myanmar's apparel exports and its peers' indicates the impact of sanctions more clearly. Table 1 lists the major export destinations of Myanmar's apparel and its peers'. Except for Myanmar, the United States and the EU have been among the top export destinations. It was also the case for Myanmar in 2001. However, after the tightening of the sanctions in July 2003, Myanmar's apparel exports to the United States dropped to zero subsequently. For Myanmar, major destinations of apparel exports turned into Japan and the Republic of Korea. Nonetheless, they did not fully make up for the lost exports to the sanctioning countries. In this table, Myanmar is the only country whose apparel export value in 2010 is lower than that in 2001.

Table 1

Table 2 below summarises per capita exports of Myanmar and its peers, and the composition of exports by goods classification in HS[3] two digit codes. For example, per capita exports of Myanmar in 2001 was USD 57, and three largest export items and their share in total exports were HS27 (25.3%), HS61 (18.8%), and HS44 (15.0%), respectively. The share of apparel exports (sum of exports of HS 61, 62, and 64) are high for Myanmar's peers. For example, exports of apparel accounted for 83.1 % of Cambodia's total exports in 2010, 82.3 % in Bangladesh, and 25.5 % in Viet Nam. Along with the information on destinations of apparel exports in Table 1, this table confirms that the United States and the EU were the most important markets especially for Bangladesh and Cambodia.

[3] HS stands for the Harmonized Commodity Description and Coding System.

Table 2

The EU and the United States suspend tariffs on imports from designated low-income countries through the Generalized System of Preferences (GSP) to promote their exports and economic growth.[4] Under the "Everything but Arms" agreement (EBA), the EU admits duty-free and quota-free imports of goods except arms from least developed countries, provided the goods satisfy rules of origin. This scheme has been applied to Bangladesh, Cambodia, and Lao PDR. The United States provides similar preferential treatment for Bangladesh and Cambodia.[5] These schemes helped Myanmar's peers to expand exports, especially apparel.

In April 1989, the United States suspended the GSP preferences it had offered Myanmar since 1976. The EU withdrew it in March 1997, citing the junta's widespread use of forced labour.[6] Thus, Myanmar was placed in a disadvantageous position compared with its peers.[7]

[4] Collier and Venables (2007) illustrate how trade preferences of industrialised countries promote manufacturing exports of low-income countries with particular reference to African countries.

[5] The United States has conducted normal trade relations with Viet Nam since December 2001. For example, its import duty on ordinary men's cotton shirts from Viet Nam is 19.7 per cent whereas it is 0 per cent for shirts from Bangladesh and Cambodia. The EU applies the GSP program for Viet Nam that is less preferential than the EBA: its import duty on ordinary men's cotton shirts is 9.6 per cent, discounted from the 12 per cent most favoured nation tariff rate but much higher than 0 per cent applicable to other least developed countries.

[6] Japan was exceptional among industrialised countries in maintaining the GSP scheme and provided duty-free and quota free market access for Myanmar goods.

[7] According to Anukoonwattaka and Mikic (2012), the proportion of Myanmar's agricultural exports that received duty-free treatment in 2006–2009 was about 16 per cent of total agricultural export values, whereas it exceeded 40 per cent for other low-income countries.

Since the establishment of the new government, Myanmar's relations with the EU and the United States have improved. In July 2013, the EU reinstated GSP preferences for Myanmar and applied the EBA scheme retroactively from June 2012. In April 2013, the United States was reported to be considering resumption of the GSP with Myanmar. Tariff exemptions in EU and U.S. markets will give impetus to Myanmar exports.

Another interesting trend observable in Table 2 is that Viet Nam achieved diversification of exports by 2010 in comparison with the other low income countries. Electrical machinery and equipment (HS85) became the largest export item while the exports of fuels and oils (HS27) continued modest growth in terms of absolute value. Such a growth pattern was observed in Malaysia and Thailand in the late 1980s and the 1990s (Reinhardt 2000). In contrast, Myanmar registered a decline in manufactured goods exports in the same period.

III. Literature review

This study projects Myanmar's export potential by calculating theoretically predicted trade value using an augmented gravity model regression. In the extensive literature of trade analyses using gravity model regressions, two lines of inquiry are relevant to this study's objective. One is the projection of trade potential in the event of a policy change. The other is the analysis of the effects of economic sanctions on bilateral trade flows.

First, studies generally interpret the trade value predicted by the gravity regression as a country's trade potential. Furthermore, they generally interpret the gap between a country's predicted and actual trade values as unexhausted trade potential. Numerous

studies, especially in the 1990s, projected trade potential for former communist economies when they started economic integration with market economies.

In formulating sample sets for projecting trade potential of former communist economies, Egger (2002) classifies studies into two approaches. One approach is to estimate a gravity equation that excludes former communist economies from the sample. Instead, a gravity equation is estimated using the sample set of market economies, and its estimated parameters are used to calculate the counterfactual trade of the countries considered, an approach referred to as out-of-sample projection.[8] The other approach is to estimate a gravity equation by including countries under consideration in the sample set. Then the residual of the estimated equation—the gap between the actual and fitted values—is interpreted as unexhausted trade potential. This approach is referred to as in-sample projection.[9] Egger (2002) argues that in-sample projection produces biased estimates of trade potential. For a consistent and efficient estimator, the residuals of a gravity model regression should be white noise. Systematic, large, positive errors should not necessarily be regarded as unexhausted trade potential but as indications of model misspecification.

Second, there are studies that analyse effects of economic sanctions with a dummy variable in the gravity equation regression. A negative coefficient for a dummy is regarded as evidence that sanctions reduced trade volume. Examples include Evenett (2002), Hufbauer and Oegg (2003), Yang et al. (2004), and Caruso (2005).

Few trade analyses examine Myanmar using a gravity model. Nu Nu Lwin (2009) examines the impact of economic sanctions against Myanmar using bilateral trade data

[8] Its applications include Wang and Winters (1992) for Eastern Europe and Montenegro and Soto (1996) for Cuba.

[9] Its applications include Baldwin (1994) and Nilsson (2000).

of Myanmar, employing a dummy variable for sanctioning countries in a gravity equation. A drawback of this approach is that the indirect effects of sanctions on trade between Myanmar and a third country such as Japan cannot be captured properly.

Ferrarini (2013) studies Myanmar's export potential using the out-of-sample approach. Myanmar's counterfactual export value is projected with the parameters of the gravity equation estimated using export data of six ASEAN members with their 35 major trade partners. He finds that Myanmar's actual exports surpassed their projected potential from 2000 to 2007. However, since then its export potential has grown rapidly, and in 2010, it was four times greater than actual exports. Following Ferrarini (2013), this study utilizes the out-of-sample approach.

Since an accurate projection requires that the estimated parameters be consistent and efficient, two econometric issues require close attention. One is the treatment of multilateral resistance (Anderson and van Wincoop, 2003) in a gravity equation. The other is the omission of observations where bilateral trade is zero (Santos Silva and Tenreyro, 2006).[10]

First, the literature presents several ways to control for multilateral resistance in a conventional gravity equation. A conventional specification of a gravity equation is

$$\ln(x_{ij}) = \alpha_1 + \alpha_2 \ln(y_i) + \alpha_3 \ln(y_j) + \alpha_4 \ln(d_{ij}) + \varepsilon_{ij}, \quad (1)$$

where x_{ij} refers to exports from Country i to Country j; y_i and y_j are GDP in each country, and d_{ij} is the distance between the countries. One way to control multilateral resistance is to add to the conventional gravity equation the fixed effects for each

[10] Shepherd (2013) offers intuitive guides on these issues.

exporter and importer (Anderson and van Wincoop, 2003). If we use a cross-section dataset with one observation of trade value for each pair of exporter and importer, we need to drop the GDP of exporters and importers as they are perfectly collinear with the fixed effects. This is not a suitable option for our purpose of predicting Myanmar's export potential with the out-of-sample approach; since we cannot have an estimate of the exporter fixed effect for Myanmar, we cannot obtain predictions for Myanmar.

If we employ pooled data with multiple observations of trade values for each pair of exporter and importer, we can include the fixed effects for each exporter and importer without dropping the GDP variables from the gravity model. However, this requires us to control changes in multilateral resistance over time. Vandenbussche and Zanardi (2010) add the bilateral real exchange rate (RER) for each pair of exporter and importer in their gravity model to control changes in multilateral resistance over time. This study follows the approach of Vandenbussche and Zanardi (2010).[11]

Second, the present study employs the Poisson pseudo-maximum-likelihood (PPML) method with the trade values in level, not in log. Santos Silva and Tenreyro (2006) prove that the PPML provides efficient estimators when the conditional variance is proportional to the conditional mean, which is particularly the case for a gravity model. Applications of the PPML method to the trade analysis include Chen et al. (2011) and Kucharcukova et al. (2012).

IV. Empirical analysis

[11] Strictly speaking, even in this approach, we cannot obtain an estimate of the exporter fixed effect for Myanmar. For prediction of Myanmar's export potential, we need to assume that it is the same as the exporter fixed effect for one of exporters in the sample.

IV.1 Dataset and model specification

In the formulation of its dataset, this study differs from Ferrarini (2013) in two aspects. First, it focuses on non-resource exports, whereas Ferrarini (2013) considers total exports including natural resources. This study employs non-resource exports as the dependent variable in its gravity equation. Resource exports are defined by SITC codes 2 and 3. These categories are subtracted from total exports.

Second, projections of export potential using the out-of-sample approach might be influenced by the choice of exporters in the dataset. Ferrarini's (2013) dataset consists of exports of six ASEAN members (Cambodia, Indonesia, Malaysia, Philippines, Thailand, and Viet Nam) to 35 major trading partners. That selection of exporters is skewed to middle-income countries with high export performance. Ferrarini's choice of exporters in the dataset is constrained by the patchy export data of low income developing countries, and he drops Lao PDR, for example, although it is geographically proximate to Myanmar. In this regard, this study employs data on imports from these countries reported by their trade partners. This allows us to add four other low- and lower-middle-income countries (Bangladesh, Lao PDR, Nepal, and Sri Lanka) as exporters in the dataset. These four countries are regarded as Myanmar's peers in IMF (2012, 2013). They are geographically proximate to Myanmar, and are considered to have similarity in economic structure with Myanmar. The sample consists of these 10 countries' exports to 157 countries and regions. Once we obtain the parameters of the gravity equation, we interpolate Myanmar's data to derive counterfactual export potential.

Figure 2 summarises the total exports and the proportion of resource exports in these

10 countries and Myanmar. This figure shows the total exports and the proportion of resource exports in averages of 2004-2011. Regarding total exports, countries are divided into two groups. One is with total exports above USD 50 billion, including Indonesia, Malaysia, Philippines, Thailand, and Viet Nam. The other is with total exports less than USD 20 billion. Regarding the proportion of resource exports to total exports, Myanmar's score is the highest.

Figure 2

Sources of data are as follows. Trade data are from the *United Nations Commodity Trade* (*UN Comtrade*) database in the World Bank's *World Integrated Trade Solution* (*WITS*) website.[12] This study employs data on imports from Myanmar and the 10 countries reported by their trade partners. GDP data are from the *World Economic Outlook Database* April 2013 of the International Monetary Fund (IMF). Distance data are from the CEPII website.[13] The bilateral real exchange rate (RER) for each pair of exporter and importer is calculated with the data of the *International Financial Statistics* of the IMF.[14]

The sample spans eight years from 2004 to 2011. The year 2004 was when the impacts of sanctions reached full-scale, following the tightening of the U.S. sanctions in July 2003. On the other hand, Myanmar's GDP data is available up to 2011, which

[12] http://wits.worldbank.org/wits/.

[13] http://www.cepii.fr/.

[14] As Myanmar had a multiple exchange rate regime during the sample period, a time series of parallel exchange rate of the local currency kyat per US dollar compiled by a foreign mission in Myanmar is employed instead of the official exchange rate.

restricts the analysis period.

The specification of the gravity equation is as follows.

$$X_{ijt} = \exp\{c + \alpha_i + \alpha_j + \beta_1 \ln(GDP_{it}) + \beta_2 \ln(GDP_{jt}) + \beta_3 \ln(dist_{ij}) + \beta_4 RER_{ijt} + \beta_5 RATIO_{it} + \beta_6 ASEAN_{ij} + \beta_7 Year_t\} + \varepsilon_{ijt} \quad (2)$$

where X_{ijt} refers to imports of non-resource goods from country i ($i \in 10$ countries) reported by country j ($j \in 157$ countries, $j \neq i$) in year t. c is a constant. α_i and α_j denote fixed effect dummies for each exporter (i) and importer (j). GDP_i and GDP_j denote GDP of exporters (i) and importers (j). $dist_{ij}$ is the distance between two countries. RER_{ij} is the RER of the exporter's currency vis-à-vis the importer's currency. A rise in RER_{ij} indicates real depreciation of the exporter's currency. Each value of RER_{ij} in 2004 is normalised to unity.

A characteristic of the present model is inclusion of $RATIO_{it}$, which refers to the proportion of natural resource exports to total exports of exporter (i) in year (t). It should be noted that $RATIO_{it}$ is constant across any importers for a given year. There are two purposes of the inclusion of this variable in a gravity model. One is to evaluate the "Dutch disease" effects of resource exports on non-resource exports. The other is to adjust the GDP of exporter; the GDP of exporter in a conventional gravity model is associated with the supply capacity of the country to the export market. As our dependent variable of the gravity model is non-resource exports, the supply capacity variable has to be adjusted accordingly. The variable $RATIO_{it}$ is expected to do the due adjustment. In any case, the expected sign of the coefficient on this variable is negative.

Finally, to capture the enhanced intra-ASEAN trade flows (Elliot and Ikemoto, 2004),

we include an ASEAN dummy that takes 1 when both the exporter and importer are members of ASEAN, and 0 otherwise. $\mathbf{Year}_t$ is a set of year dummies.

IV.2 Potential for export growth

Using the PPML method, our gravity equation is estimated by pooling samples for the eight indicated years. For the purpose of comparison, gravity equations are estimated not only with non-resource exports, but also with total exports as dependent variables. Table 3 summarises the results of gravity regressions. It should be noted that the fixed effect dummies for importers and the year dummies are included in regressions, but are not reported in the table. In addition, the exporter fixed effect dummy for Bangladesh is dropped in each regression to avoid perfect multi-collinearity. In other words, we treat Bangladesh as the benchmark, and set its exporter fixed effect to zero. Switching the benchmark from Bangladesh to any other country does not affect regression results or the size order of exporter fixed effects among 10 exporter countries in the sample.

Table 3

In Table 3, the regression results with and without the $\mathbf{RATIO}_{it}$ variable are presented. Coefficients of GDPs for exporter and importer and for distance are significant and have the expected signs. The coefficient of the RER is not significant, but is positive except for Regression (3). Importantly, the coefficient on the natural resource export ratio is significant and negative for both regressions of non-resource exports and of total exports. The latter result indicates that an increase in natural

resource export ratio would accompany a decline in total exports. This implies the "Dutch disease" effects among the 10 Asian countries.

Furthermore, the exporter fixed effects dummies are significant for Indonesia, Malaysia, Nepal, Philippines, Thailand, and Viet Nam. As Bangladesh is the benchmark in our regressions, the results indicate that the export performances of these countries are significantly different from Bangladesh's. The results are consistent with the observations of total exports in Figure 2. Bangladesh's export performance in terms of the exporter fixed effects, which is set to zero by definition, is better than those of Cambodia, Lao PDR, Sri Lanka, and Nepal, whereas the performance gap is not statistically significant with Cambodia and Sri Lanka.

When we project Myanmar's export potential with the parameters of gravity equations, we choose the exporter fixed effect of Bangladesh from those of the 10 countries in the sample. This selection is based on the fact that Bangladesh and Myanmar share the land borders and have similar level of per capita GDP[15]. In addition, as shown in Figure 2, both Bangladesh and Myanmar are in the lower performing exporter cluster that consists of Cambodia, Lao PDR and Sri Lanka in addition to these two countries. Furthermore, the exporter fixed effect for Bangladesh, set to zero by definition, is the highest among the countries in the lower cluster. Therefore, using the exporter fixed effect of Bangladesh would give us rather overvalued projection of Myanmar's export potential.

To see the fit of models, Table 4contrasts the actual exports with the predicted values of the gravity regressions by exporter-year. As for non-resource exports, theoretically

[15] According to World Economic Outlook database April 2013, per capita GDP in 2011 in current U.S. dollar for Bangladesh is USD 767 and that for Myanmar is USD 824.

predicted values are calculated by Regression (2) including the natural resource export ratio as a control variable. As for total exports, predicted values are calculated by Regression (3) without the natural resource export ratio. Both Regression (2) of non-resource exports and Regression (3) of total exports predict well the trade values, in particular for Indonesia, Malaysia, and Thailand.

Table 4

Table 4 includes the actual and counterfactual predicted export values for Myanmar. Predictions are calculated using the exporter fixed effect of Bangladesh. There is a stark contrast between the predictions of non-resource exports and those of total exports. For non-resource exports, the actual to prediction ratio is above one, implying there is little room for growth in non-resource exports even after the lifting of sanctions. In contrast, for total exports, the actual to prediction ratio is around 0.50, implying that total exports could have doubled without the sanctions. Such a gap is attributable to the possible "Dutch disease" effects. If we calculate the counterfactual prediction values of non-resource exports with Regression (1) that does not include the resource export ratio variable, the actual to prediction ratio falls to 0.17 for the average of 2004-2011. These results imply that the "Dutch disease" is really at stake for Myanmar.

Table 5 lists Myanmar's actual and predicted non-resource exports as well as total exports by destination for an average of eight years from 2004 through 2011. Actual exports to the United States were negligible during the sanctions, whereas the United States is projected as Myanmar's largest potential export destination. As a result, the United States accounts for the largest proportion of Myanmar's unexhausted export

potential.

Table 5

The above results indicate that restored access to the U.S. market after the lifting of sanctions will help Myanmar to increase exports to the United States, notably those of apparel. It is crucial for Myanmar's new government to improve diplomatic relations with the United States to restore its GSP status. Once we take into account the "Dutch disease" effects, however, the lifting of sanctions does not necessarily lead to a significant increase in the sum of non-resource exports to the world.

Also, the empirical results suggest that the "Dutch disease" effects have been at stake in Asian countries during the sample period. A higher ratio of resource exports to total exports coincided with not only lower non-resource exports, but also lower total exports. However, the gravity regressions do not tell the causality or the mechanism of the adverse effects of natural resource exports on non-resource exports. In addition, the RER, although having the expected sign, is not statistically significant. Further studies are necessary to examine the "Dutch disease" among these countries.

V. Conclusion

After the easing of economic sanctions by Western countries in 2012, Myanmar enjoys augmented prospects for growth in exports. On the other hand, the proportion of natural resource exports to total exports has risen above 60% during the sanctions

period, bringing in a concern about the “Dutch disease” effects on non-resource exports. By calculating counterfactual exports with the augmented gravity model taking into account the “Dutch disease” effects, this study has projected Myanmar’s potential to export non-resource goods.

The counterfactual prediction values of Myanmar’s non-resource exports vary substantially whether we take into account the possible “Dutch disease” effects of natural resource exports. If we take it into account, the counterfactual prediction values are less than the actual non-resource exports, implying a limited room of non-resource export growth even after the lifting of the sanctions. In contrast, if we do not take it into account, the ratio of actual to predicted values for an average of 2004-0211 is 0.17, implying a large room of non-resource export growth. In any case, the United States accounted for the largest share of Myanmar’s unexhausted export potential.

The lifting of sanctions, restored access to U.S. markets, and reinstatement of GSP preferences by the EU are expected to enhance Myanmar’s exports to these countries to a certain degree. Apparel, including footwear, will be important export items to the United States and the EU in the immediate future. However, once we take into consideration the potential “Dutch disease” effects of natural resource exports, the lifting of sanctions does not necessarily translate into a sharp rise in the sum of non-resource exports to the world.

At the same time, the “Dutch disease” is at stake in Myanmar as well as Asian countries. Myanmar may not follow the growth path of other resource rich Southeast Asian countries (Indonesia, Malaysia, and Thailand) that archived economic diversification despite the abundant natural resources. The problem would be severe for Myanmar than any other Southeast Asian countries as Myanmar has the highest ratio of

natural resource exports to total exports. Since the gravity model does not tell the mechanism how natural resource exports could dampen the non-resource exports, further studies are necessary to identify such mechanism.

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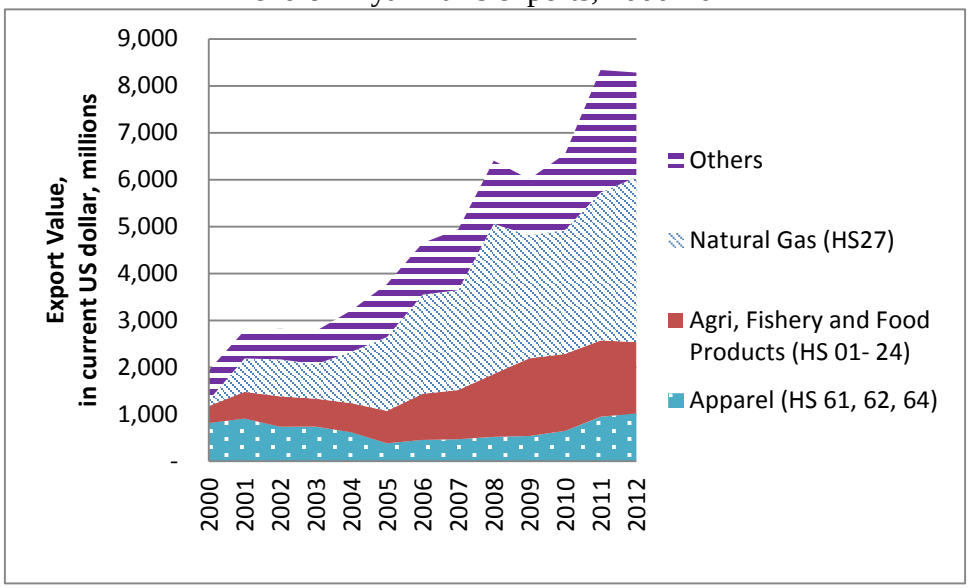
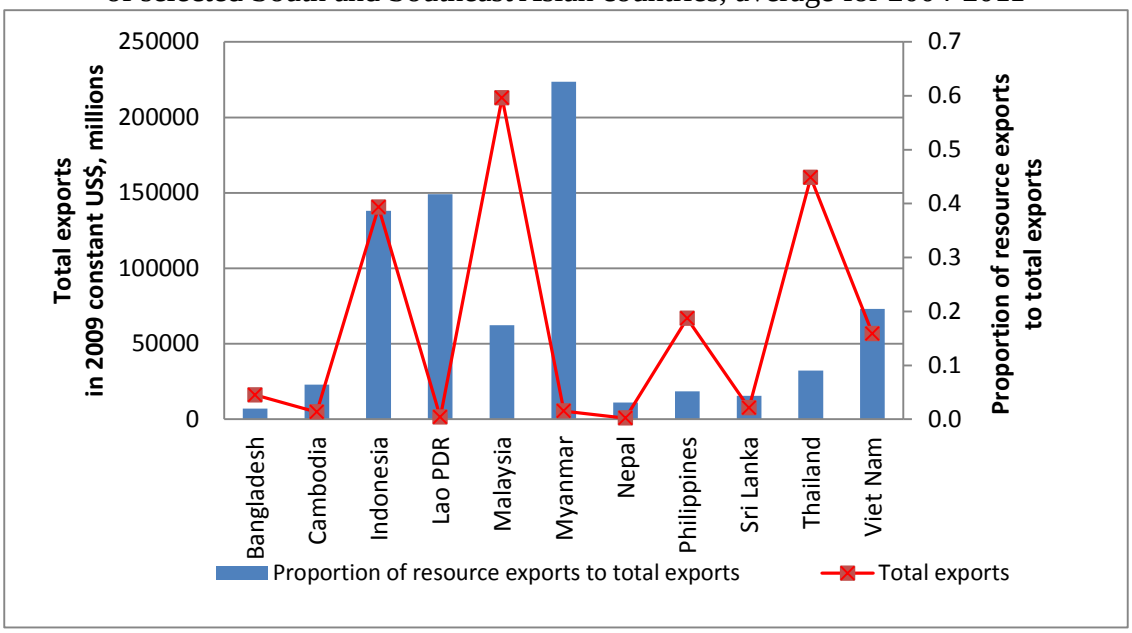
Figure 1
Trend of Myanmar's exports, 2000-2012



Source: UN Comtrade

Notes: Apparel includes HS61 (articles of apparel and clothing accessories, knitted or crocheted), HS62 (articles of apparel and clothing accessories, not knitted or crocheted), and HS64 (footwear, gaiters and the like). Natural Gas refers to HS27 (mineral fuels, mineral oils, and products of their distillation) in this figure.

Figure 2
Total exports and proportion of resource exports
of selected South and Southeast Asian countries, average for 2004-2011



Source: UN Comtrade.

Table 1
Major export destinations of Myanmar's apparel and its peers'

	2001		2005		2010	
			Unit: US dollar, millions.			
Bangladesh	Total	5,091	Total	8,165	Total	17,020
	EU 25	2,758	EU 25	4,981	EU 25	10,102
	United States	2,044	United States	2,423	United States	4,073
	Canada	100	Canada	362	Canada	723
Cambodia	Total	1,573	Total	2,861	Total	4,757
	United States	971	United States	1,807	United States	2,329
	EU 25	478	EU 25	732	EU 25	1,538
	Japan	60	Canada	107	Canada	340
Lao PRD	Total	135	Total	187	Total	199
	EU 25	124	EU 25	169	EU 25	131
	United States	4	Canada	6	United States	34
	Norway	3	United States	3	Japan	15
Myanmar	Total	909	Total	383	Total	647
	United States	435	EU 25	250	Japan	259
	EU 25	375	Japan	88	EU 25	189
	Canada	29	Korea, Rep. of	8	Korea, Rep. of	126
Viet Nam	Total	4,095	Total	9,777	Total	19,385
	EU 25	2,757	EU 25	4,123	United States	7,795
	Japan	592	United States	3,601	EU 25	6,489
	United States	192	Japan	720	Japan	1,413

Source: UN Comtrade
Note: Apparel includes HS61, 62, 64.

Table 2
Per capital exports and composition of exports by goods classification
for Myanmar and its peers

	2001				2005				2010			
	Per capita exports (US$)	Export composition in HS code and its share (%)			Per capita exports (US$)	Export composition in HS code and its share (%)			Per capita exports (US$)	Export composition in HS code and its share (%)		
		1st	2nd	3rd		1st	2nd	3rd		1st	2nd	3rd
Bangladesh	49	HS62	HS61	HS03	72	HS61	HS62	HS03	136	HS61	HS62	HS63
		44.6	31.1	4.9		39.4	38.9	4.3		45.3	36.0	3.9
Cambodia	142	HS61	HS62	HS64	244	HS61	HS62	HS64	402	HS61	HS62	HS64
		41.7	38.8	8.0		48.9	34.0	4.9		53.9	19.4	9.1
Lao PDR	60	HS44	HS62	HS61	105	HS44	HS61	HS62	311	HS74	HS26	HS44
		36.1	23.6	16.1		28.1	15.7	13.9		23.4	21.0	16.3
Myanmar	57	HS27	HS61	HS44	75	HS27	HS44	HS07	126	HS27	HS07	HS44
		25.3	18.8	15.0		41.6	21.5	8.3		40.4	15.2	13.1
Viet Nam	177	HS27	HS64	HS62	408	HS27	HS64	HS62	858	HS85	HS64	HS27
		24.2	17.3	8.8		23.7	14.3	9.0		11.5	10.8	9.7

Sources: UN Comtrade; International Financial Statistics, IMF.

Notes: HS03 (fish and crustaceans), HS07 (edible vegetables and certain roots and tubers), HS26 (Ores, slag and ash), HS27 (mineral fuels, mineral oils, and products of their distillation), HS44 (wood and articles of wood), HS61 (articles of apparel and clothing accessories, knitted or crocheted), HS62 (articles of apparel and clothing accessories, not knitted or crocheted), HS64 (footwear, gaiters and the like), HS74 (copper and articles thereof), HS85 (electrical machinery and equipment and parts thereof).

Table 3
Gravity regressions

Dependent Variable	(1) Non-resource Exports	(2) Non-resource Exports	(3) Total Exports	(4) Total Exports
GDP Exporter (log)	0.351	0.435 *	0.427	0.499 *
	(0.2277)	(0.2290)	(0.2617)	(0.2646)
GDP Importer (log)	0.616 ***	0.535 ***	0.674 ***	0.636 ***
	(0.1842)	(0.1836)	(0.1582)	(0.1589)
Distance (log)	-0.603 ***	-0.603 ***	-0.537 ***	-0.537 ***
	(0.0563)	(0.0553)	(0.0426)	(0.0428)
Bilateral Real Exchange Rate	0.040	0.299	-0.075	0.048
	(0.2757)	(0.2737)	(0.2838)	(0.2872)
Resource Export Ratio		-3.060 ***		-1.609 ***
		(0.6977)		(0.5948)
ASEAN (1, 0)	2.347 ***	2.351 ***	2.251 ***	2.253 ***
	(0.1347)	(0.1356)	(0.1313)	(0.1318)
Exporter: Indonesia (1, 0)	1.091 ***	2.118 ***	1.403 ***	1.895 ***
	(0.3974)	(0.4213)	(0.4566)	(0.4998)
Exporter: Cambodia (1, 0)	-0.630	-0.275	-0.436	-0.190
	(0.5455)	(0.5572)	(0.6246)	(0.6326)
Exporter: Lao PDR (1, 0)	-2.204 ***	-0.704	-1.430 *	-0.552
	(0.6948)	(0.8084)	(0.8018)	(0.8557)
Exporter: Sri Lanka (1, 0)	-0.376	-0.180	-0.317	-0.195
	(0.2413)	(0.2489)	(0.2794)	(0.2830)
Exporter: Malaysia (1, 0)	1.999 ***	2.431 ***	2.092 ***	2.295 ***
	(0.2192)	(0.2232)	(0.2456)	(0.2607)
Exporter: Nepal (1, 0)	-2.402 ***	-2.165 ***	-2.259 ***	-2.084 ***
	(0.5108)	(0.5162)	(0.5811)	(0.5864)
Exporter: Philippines (1, 0)	1.085 ***	1.190 ***	1.027 ***	1.062 ***
	(0.1719)	(0.1684)	(0.1829)	(0.1850)
Exporter: Thailand (1, 0)	1.757 ***	1.923 ***	1.726 ***	1.781 ***
	(0.2625)	(0.2567)	(0.2908)	(0.2950)
Exporter: Viet Nam (1, 0)	0.907 ***	1.459 ***	1.069 ***	1.358 ***
	(0.1192)	(0.1762)	(0.1202)	(0.1650)
Observations	11768	11768	11768	11768
Pseudo log-likelihood	-4.89E+08	-4.79E+08	-5.47E+08	-5.44E+08

Source: Author's calculation.

Notes: Semi-robust standard errors in parentheses. *** indicates 1 % significance level, and * 10 %. Regressions are performed by STATA with the command "ppml". STATA drops 712 observations for existence of estimates. The dropped observations are importers with zero trade values for the whole sample period.

Table 4
Actual and predicted exports by exporter-year, 2004-2011

	Non-resource exports (Prediction **with** consideration on "Dutch disease" effects)								Total exports (Prediction **without** consideration on "Dutch disease" effects)							
	2004	2005	2006	2007	2008	2009	2010	2011	2004	2005	2006	2007	2008	2009	2010	2011
Bangladesh																
Actual (constant 2009 US$, mil.)	10838	10871	13394	13972	16325	16500	19464	24904	10966	11072	13654	14254	16691	16907	19870	25504
Predicted (constant 2009 US$, mil.)	12005	12936	14554	15616	17635	14500	18279	21415	13127	13806	14660	15822	17433	15300	18674	20834
Actual to prediction	0.90	0.84	0.92	0.89	0.93	1.14	1.06	1.16	0.84	0.80	0.93	0.90	0.96	1.11	1.06	1.22
Cambodia																
Actual (constant 2009 US$, mil.)	3132	3302	3972	4417	4677	4146	5166	6840	3301	3492	4177	4678	4958	4563	5586	7443
Predicted (constant 2009 US$, mil.)	3218	3631	4296	4701	5271	3762	5048	5921	3496	3903	4350	4801	5465	4528	5504	6332
Actual to prediction	0.97	0.91	0.92	0.94	0.89	1.10	1.02	1.16	0.94	0.89	0.96	0.97	0.91	1.01	1.01	1.18
Indonesia																
Actual (constant 2009 US$, mil.)	67092	68920	76251	85067	94119	79300	98013	112405	99505	108706	122867	137052	158511	127400	165298	204655
Predicted (constant 2009 US$, mil.)	69560	68594	77095	86403	93414	82200	99792	105622	98730	107184	125504	137669	153170	129000	171918	201554
Actual to prediction	0.96	1.00	0.99	0.98	1.01	0.96	0.98	1.06	1.01	1.01	0.98	1.00	1.03	0.99	0.96	1.02
Lao People's Democratic Republic																
Actual (constant 2009 US$, mil.)	286	377	677	841	939	804	890	1169	469	642	1082	1164	1400	1405	1958	2802
Predicted (constant 2009 US$, mil.)	535	559	758	1130	1127	669	618	667	932	1030	1214	1339	1549	1317	1692	1981
Actual to prediction	0.53	0.68	0.89	0.74	0.83	1.20	1.44	1.75	0.50	0.62	0.89	0.87	0.90	1.07	1.16	1.41
Malaysia																
Actual (constant 2009 US$, mil.)	146973	156537	169799	177737	186424	153000	194643	212213	166831	179909	199435	214825	236104	187200	244539	275005
Predicted (constant 2009 US$, mil.)	145851	159798	174018	179791	187432	153000	188715	212213	159314	176104	195111	215750	241848	189000	244045	282951
Actual to prediction	1.01	0.98	0.98	0.99	0.99	1.00	1.03	1.00	1.05	1.02	1.02	1.00	0.98	0.99	1.00	0.97
Myanmar																
Actual (constant 2009 US$, mil.)	1582	1375	1751	1734	1900	2293	2409	3351	3553	4023	4818	4970	6321	5896	6335	7947
Predicted (constant 2009 US$, mil.)	1275	1080	1394	1499	1559	1635	2126	2812	7530	8188	9256	11096	13906	12100	16006	18411
Actual to prediction	1.24	1.27	1.26	1.16	1.22	1.40	1.13	1.19	0.47	0.49	0.52	0.45	0.45	0.49	0.40	0.43

(Continued)

Table 4 (continued)
Actual and predicted exports by exporters, 2004-2011

	Non-resource exports (Prediction **with** consideration on "Dutch disease" effects)								Total exports (Prediction **without** consideration on "Dutch disease" effects)							
	2004	2005	2006	2007	2008	2009	2010	2011	2004	2005	2006	2007	2008	2009	2010	2011
Nepal																
Actual (constant 2009 US$, mil.)	754	727	625	758	932	623	749	771	763	741	648	791	964	659	772	791
Predicted (constant 2009 US$, mil.)	565	606	654	688	833	621	868	1070	571	626	680	740	832	698	899	1050
Actual to prediction	1.33	1.20	0.96	1.10	1.12	1.00	0.86	0.72	1.34	1.18	0.95	1.07	1.16	0.94	0.86	0.75
Philippines																
Actual (constant 2009 US$, mil.)	59462	63593	67814	72225	66911	48500	65408	62792	61019	65688	71558	76861	70616	50961	69503	68566
Predicted (constant 2009 US$, mil.)	49253	53266	57479	62156	72554	57700	72522	79362	48916	53592	60326	67191	74872	61200	77363	88180
Actual to prediction	1.21	1.19	1.18	1.16	0.92	0.84	0.90	0.79	1.25	1.23	1.19	1.14	0.94	0.83	0.90	0.78
Sri Lanka																
Actual (constant 2009 US$, mil.)	6207	6586	6971	7358	7882	6610	7449	8700	6431	6807	7248	7669	8192	6911	7849	9357
Predicted (constant 2009 US$, mil.)	5244	5878	6662	7236	8344	6555	8278	9436	5464	6117	6774	7324	8446	7060	8826	10272
Actual to prediction	1.18	1.12	1.05	1.02	0.94	1.01	0.90	0.92	1.18	1.11	1.07	1.05	0.97	0.98	0.89	0.91
Thailand																
Actual (constant 2009 US$, mil.)	104901	116316	129722	146915	164255	140000	174882	186050	113764	125991	142800	160682	183200	151600	192074	211341
Predicted (constant 2009 US$, mil.)	110398	120664	132886	151025	160224	136000	170930	184112	122291	132622	148706	164381	178363	146000	185751	209306
Actual to prediction	0.95	0.96	0.98	0.97	1.03	1.03	1.02	1.01	0.93	0.95	0.96	0.98	1.03	1.04	1.03	1.01
Viet Nam																
Actual (constant 2009 US$, mil.)	23336	26850	32378	40068	50687	49800	63629	79943	30784	36432	43195	51554	65186	59668	73167	92986
Predicted (constant 2009 US$, mil.)	27263	28481	34276	41506	48067	45600	65704	77715	41175	45765	50834	55581	64593	54400	66594	77908
Actual to prediction	0.86	0.94	0.94	0.97	1.05	1.09	0.97	1.03	0.75	0.80	0.85	0.93	1.01	1.10	1.10	1.19

Sources: UN Comtrade and author's calculation

Notes: Predictions of non-resource exports are calculated by Regression (2) in Table 3, and those of total exports by Regression (3).

Table 5
Myanmar's actual and predicted exports by importers, average of 2004–2011

		Non-resource exports (Prediction **with** consideration on "Dutch disease" effects)			Total exports (Prediction **without** consideration on "Dutch disease" effects)		
	Importer	Actual	Predicted	Actual to prediction	Actual	Predicted	Actual to prediction
1	United States	0	286	0.00	0	1750	0.00
2	China	245	237	1.03	633	1788	0.35
3	Japan	296	142	2.08	325	1363	0.24
4	Thailand	158	100	1.59	2550	694	3.68
5	Singapore	49	85	0.58	88	677	0.13
6	Germany	103	71	1.45	109	436	0.25
7	Hong Kong, China	49	68	0.72	52	432	0.12
8	Malaysia	94	66	1.42	164	472	0.35
9	Netherlands	12	46	0.27	15	281	0.05
10	United Kingdom	78	46	1.70	79	274	0.29
11	Republic of Korea	88	40	2.20	115	486	0.24
12	India	518	39	13.23	874	358	2.44
13	Australia	15	32	0.47	16	299	0.05
14	France	31	31	0.98	35	194	0.18
15	Viet Nam	18	30	0.60	68	218	0.31
16	Mexico	6	28	0.21	6	166	0.04
17	Indonesia	30	26	1.14	31	238	0.13
18	Canada	6	23	0.25	6	144	0.04
19	Philippines	7	20	0.34	7	146	0.05
20	Italy	14	20	0.70	28	138	0.21
	The rest	29	29	0.99	278	1503	0.18
	Total	1846	1466	1.26	5479	12056	0.45

Source: UN Comtrade and author's calculation.
Notes: Counterfactual predictions of non-resource exports are calculated by Regression (2) in Table 3, and those of total exports by Regression (3). The values are deflated by U.S. GDP deflator to constant 2009 U.S. dollar in millions.