Economic Cooperation in the Greater Mekong Sub-Region

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Abstract This paper investigates the impact of regional economic cooperation between Vietnam and its partners during the 2000-2015 period, focusing on the Greater Mekong Sub-region (GMS). Overall, the GMS represents a significant portion of Vietnam's trade portfolio. China is the dominant trading partner in the GMS, exhibiting strong influence over Vietnam's trade, especially its imports. However, using the gravity model of trade, we find that Vietnam has not benefited from GMS cooperation, as exemplified by its significant trade deficit, particularly with China. We further find that human capital enhancement and financial development are key factors to facilitate Vietnam's trade, and mitigate its trade deficit with other GMS member countries. To this end, this study provides some important policy implications for the Vietnamese government as well as policymakers in other countries, when trading with larger partners in the context of regional economic cooperation.

Keywords: Regional Economic Cooperation, Greater Mekong Sub-region, Vietnam, Trade, Gravity Model

JEL Classifications: F13, F15, C23, O53

I. Introduction

It is confidently assumed that regional economic cooperation can facilitate trade and beget economic gains to member states by deterring violent conflicts and misconceptions (Hoekman

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et al., 2002); lowering trade barriers (Mwasha, 2008); facilitating bilateral investments (Park & Park, 2009); increasing productivity (Salvatore, 2006); and fostering specialization (Baldwin & Venables, 2004). However, many acts of cooperation do not pan out as expected. Yang and Gupta (2008); and Todaro and Smith (2015) found that regional cooperation can be ineffective due to the low complementary nature of resources among participants, high level of trade barriers, and limited transport infrastructure.

Yet, although a number of studies have investigated the nexus between cooperation and economic outcomes, the empirical evidence on whether regional cooperation facilitates or impedes the economic outcomes of participating countries has not been settled. China's recent Belt and Road Initiative (BRI) has attracted the attention of governments, academic researchers, and the business community worldwide (Du, 2018; Zhai, 2018), reviving the debate over the gain/loss of regional economic cooperation. The BRI's objective is to strengthen collaboration and stimulate development across sixty countries spanning Asia, Africa, and Europe.

As a pivotal part of the BRI, the Mekong sub-region is the nucleus in China's political and economic policies, given its unique geopolitical location, continuous border with China, and a high level of sub-regional cooperation (Vannarith, 2018a). The China-led Lancang-Mekong Cooperation (LMC) was officially launched 2005. It engages in much broader cooperation, ranging from political and security issues, sustainable economic development, and social-cultural and people-to-people exchanges. Arguably, the LMC is a major channel through which China could leverage its political and economic influence in the Mekong region and ultimately facilitate its ambitious BRI (Du, 2018; Yu, 2018).

Nevertheless, researchers remain skeptical about the potential benefits of Mekong cooperation. Krongkaew (2004) found that cooperation in the Mekong sub-region can be unproductive and may impose significant disadvantages on member countries due to discrepancies in development, and conflicts between and political instability within member countries. While there have been fifteen cooperations formed in the GMS, the economic impact on members is ambiguous, and the extant literature falls short of offering adequate empirical investigation.

This paper empirically investigates whether regional economic cooperation brings trade gains to member countries, with the main focus on the GMS. Vietnam provides a uniquely interesting case, not only due to the dearth of previous studies, but also because of its specific geographical position bordering China, and near worldwide supply chains. Since Vietnam gained WTO accession in 2007, its trade policy has been oriented toward facilitating globalism and multilateralism as a part of the central plans for achieving sustainable economic growth. However, given escalating complexity in negotiating multilateral trade deals, Vietnam has prioritized bilateralism and regionalism assuming each is more conducive and complementary to trade liberalization (TPR, 2013). In addition, although Vietnam has participated in much regional cooperation, policy makers and academic scholars doubt the 'so-called' social-economic benefits (Pham, 1999;

Schmidt, 2004), calling for more in-depth investigation of the cooperation-trade nexus, as well as the potential positive channels and/or circumstances that could affect trade.

The remainder of this paper is structured as follows. Section II overviews the literature on regional economic cooperation and trade. Section III discusses current economic GMS cooperation, as well as Vietnam's participation. Section IV discusses the data and model. Section V reports the empirical results. Section VI discusses potential channels affecting trade between Vietnam and the other GMS countries. Section VII concludes and offers policy recommendations.

II. Regional Economic Cooperation and Trade - A Review of the Literature

The literature documents the positive relationship between regional economic cooperation and trade gains (Aitken, 1973; Khazeh and Clark, 1990; Fernandez and Portes, 1998; Iyoha, 2005). Aitken (1973) empirically weighed the impact of the European Economic Community and the European Free Trade Association on member trade and finds an increasing trade growth. Fernandez and Portes (1998) investigated the impact of regional trade agreements on their partners, finding that in addition to the traditional gains of trade, a number of nontraditional benefits including credibility, signaling, bargaining power, insurance, and coordination could be achieved when joining a regional trade agreement. Iyoha (2005) discussed how regional economic integration affects intra-African trade, agreeing with Fernandez and Portes (1998) that economic cooperation positively affects trade, primarily by increasing market size, competition, and investment. Yang and Martinez-Zarzoso (2014) found a positive relationship between regional cooperation and trade between China and the ASEAN Free Trade Area, mostly due to the removal of tariff barriers between intra-bloc and extra-bloc countries.

Nevertheless, regional economic cooperation may not always benefit members. Yang and Gupta (2008) found that African regional economic cooperation does not significantly promote bilateral trade, possibly because of high external trade barriers and low resource complementarity among members. Cooperation can also bring negative effects if trade diversion outweighs trade creation (Todaro & Smith, 2015).

The literature on the GMS is sparse. Yu (2003), Krongkaew (2004), and Poncet (2006) are among the few papers focusing on the Mekong area investigated the GMS, but were not able to definitively assess the effects of Mekong cooperation on its members. Specifically, Yu (2003) investigated the benefits and drawbacks of constructing a regional power-grid market in the GMS, arguing that institutional barriers, national interest, and differing levels of energy development are major obstacles that challenge the potential success of this common energy market. Thus, GMS countries should accelerate regional cooperation with a flexible approach to energy policy and energy reforms. Krongkaew (2004) asserts a more nationalist attitude

that smaller countries are more likely to suffer a patron-client relationship, in which the larger countries accrue all benefits through size and market power. Subsequently, Poncet (2006) analyzed the evolution of Yunnan economic integration with the GMS, finding that bilateral trade between Yunnan and the GMS has decreased over the 1988-1999 period.

Despite little investigation of the impact of Mekong cooperation on Vietnam's trade, researchers have posited that the long-standing issues of a lack of experience in international business and overlapping bureaucratic administrative systems can obscure any benefits from cooperation (Schmidt, 2004). Pham (1999) even posited that regional economic cooperation could negatively impact Vietnam's economy because domestic firms lack competitiveness, and become vulnerable when Vietnam economically cooperates with more advanced nations. In addition, the removal of tariffs may increase non-tariff barriers that Vietnamese firms usually fail to satisfy, such as the Sanitary and Phytosanitary Measures, and the Technical Barriers to Trade. This makes it difficult for Vietnam's goods to be exported (OECD, 2005), resulting in accelerated trade deficits as imports exceed exports, hampering the country's economy. To this end, while the Vietnamese government has provided support for GMS cooperation, whether or not the country can expect trade gains is still an open empirical question that warrants investigation

III. Regional Cooperation in the GMS

A. The mekong basin and regional cooperation

The Mekong is the twelfth largest river in the world and the longest in Southeast Asia. Its genesis lies in the Tibetan highlands, and flows through the Chinese province of Yunnan; Myanmar, Laos, Thailand, and Cambodia, and finally Vietnam. The GMS, an area of 2.3 million square kilometers with a population of 242.8 million, is an important geopolitical region.

The GMS has to date employed up to 15 mechanisms, including both intra-bloc and extra-bloc cooperation. With the former, cooperation in the Mekong Basin began in 1957 when the Mekong Committee was launched at the initiative of the United Nation Economic Commission for Asia and the Far East (ECAFE). Accordingly, the Committee's principal objectives were to solve the rising problems of poverty and political instability along the lower river basin and to promote peace and prosperity through an effective joint exploitation of the river's resources.

However, Mekong cooperation was interrupted by subsequent wars and conflicts. The process re-gained momentum in 1992 when six riparian countries of the Mekong River, assisted by the Asian Development Bank (ADB) formalized the sub-regional cooperation to be known as the Greater Mekong Sub-region. Since then, the ADB has been the main sponsor of most cooperative initiatives. The GMS program has been directed toward the facilitation of sustainable

economic growth and improving living standards in the Mekong region through factor input specialization and greatly expanded trade and investment. Since 1992, the ADB has loaned US$ 280 million to priority projects and disbursed US$ 7.6 million for technical assistance to study suitable programs and projects, and for project consultation activities.
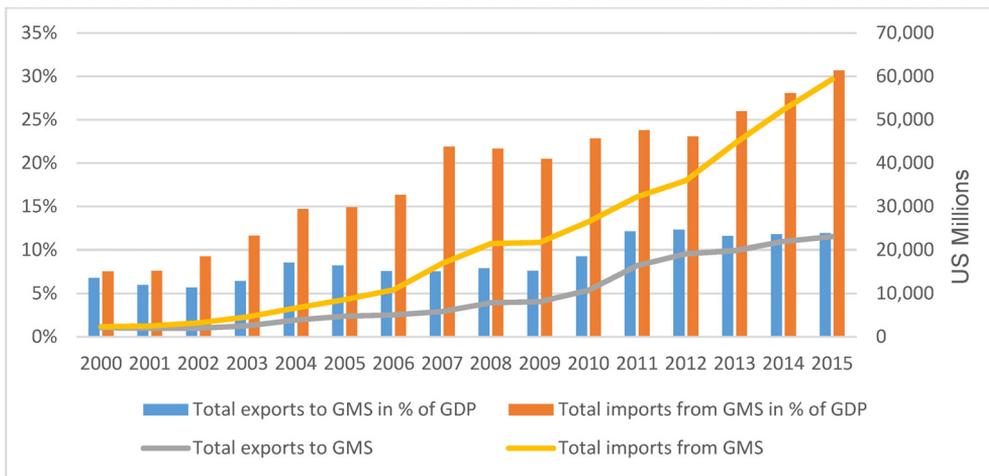
In addition, the UN and the World Bank, and other sponsor countries such as Japan, France, Australia, and the US provide support broadening the context of GMS cooperation. For example, the Japanese government has recently promised JPY 750 billion in the form of Official Development Assistance to the GMS, in order to promote infrastructure and sustainable development; and the United States has also pledged to assist the development of the region by sending its experts and scholars.

B. Vietnam's participation in regional and economic cooperation in the greater mekong sub-region

The Mekong river plays a pivotal role in Vietnam's economic activities: Twenty percent of Vietnam lies within the Mekong Basin, which produces half the country's agricultural products, including eighty percent of rice, ninety percent of rice exports, and roughly fifty percent of seafood exports. Thus, Vietnam has contributed to Mekong cooperation, mostly through promoting trade, facilitating collaboration initiatives, and providing financial assistance to neighboring countries.

The Vietnamese government has simplified customs for trading goods and people crossing. It grants travel rights to vehicles of the GMS members, and has invested in large infrastructure projects, including a number of expressways and harbors, to link Vietnamese provinces with other GMS cities in order to facilitate cooperation and trade. Ultimately, this has accelerated trade volume between Vietnam and GMS members.

Figure 1 illustrates the evolution of Vietnam's trade with the GMS members. While Vietnam's exports to the GMS members started off quite low in 2000, 2001, and 2003, they modestly yet steadily increased, reaching US$ 8.0 billion in 2009 and US$ 19.0 billion in 2012. Nevertheless, the growth rate of exports has recently decelerated, achieving only US$ 23.0 billion in 2015.

Figure 1. Vietnam's trade with GMS members

Figure 1 demonstrates that, overall, Vietnam's imports are significantly greater than its exports, indicating a substantial trade deficit. Despite starting at a low point in the first three years of the 21st century, import values subsequently accelerated, peaking in 2015 US$ 59.30 billion, accounting for over 30 percent of Vietnam's Gross Domestic Product (GDP). This upsurge produced a trade deficit US$ 36.26 billion in 2015.

Table 1 demonstrates the relative importance of GMS countries to Vietnam's imports. Overall, import values with the GMS increased over 25-fold in fifteen years, US$ 59.30 billion in 2015. Vietnam's imports from China increased the most, from just US$ 1.401 billion in 2000 to US$ 49.44 billion in 2015, followed by Thailand with US$ 8.27 billion in 2015. Accordingly, the GMS's share of Vietnam's total imports increased from 15.02 percent in 2000 to 35.83 percent in 2015, with China also taking the biggest share. During the period 2008-2015, despite a minor setback in the case of Myanmar, overall, GMS's share of the increase in Vietnam's imports reaches 44.48 percent, with China the main player.

Table 2 illustrates the relative importance of GMS countries to Vietnam's exports. In 2015, Vietnam exports to GMS countries soared to US$ 23.04 billion, a ten-fold increase since 2000. However, the proportion of total exports sent to the GMS remained at around 14 percent. Except for Cambodia and Myanmar, the proportion of Vietnam's exports to GMS countries in 2015 declined compared to the year 2000. Still, China was Vietnam's biggest export destination in the GMS with US$ 16.57 billion in goods and services 2015, accounting for 10.2 percent of Vietnam's total exports.

To obtain a more cohesive picture of the Mekong economic cooperation during the period 2000-2015, Table 3 displays Vietnam's trade balance with other GMS countries As indicated,

Vietnam has had a large and increasing trade deficit with the GMS. While Vietnam's trade balance with the rest of the world has been positive since 2010, it has been persistently negative with the GMS countries. Notably, Vietnam's trade deficit with China is the most significant at US$ 32 billion in 2015, more than six-fold that with Thailand, Vietnam's second largest trading partner. On the other hand, Vietnam has trade surpluses with Cambodia and Myanmar. Intriguingly, despite constant trade deficits with the GMS countries, Vietnam has experienced stable and rising surpluses with the rest of the world due to Vietnam's enhancement in national competitiveness and international trade opportunities.

Table 1. Relative importance of GMS countries to vietnam's imports

	Import value (US$ Thousands)		Share of total imports (%)		Share of increase in imports (%)
	2000	2015	2000	2015	2008 - 2015
GMS	2,358,621	59,299,323	15.02	35.83	44.48
Cambodia	37,298	945,967	0.2	0.6	0.9
China	1,401,137	49,441,123	8.9	29.8	39.3
Lao PDR	105,730	586,487	0.7	0.4	0.4
Myanmar	3,593	56,178	0.02	0.03	-0.02
Thailand	810,863	8,269,567	5.2	5.0	3.9

(Source) Author's calculation using data from the World Integrated Trade Solution (WITS).

Table 2. Relative importance of GMS countries to vietnam's exports

	Export value (US$ Thousands)		Share of total exports (%)		Share of increase in exports (%)
	2000	2015	2000	2015	2008 - 2015
GMS	2,124,998	23,039,607	14.53	14	15.3
Cambodia	141,620	2,395,221	0.9	1.4	0.9
China	1,536,391	16,567,686	10.6	10.2	11.8
Lao PDR	69,009	523,311	0.5	0.3	0.4
Myanmar	5,666	375,724	0.03	0.2	0.3
Thailand	372,312	31,77,666	2.5	1.9	1.9

(Source) Author's calculation using data from the World Integrated Trade Solution (WITS).

Table 3. Trade balance of vietnam with GMS countries 2000-2015 (US$ Thousands)

	2000	2005	2010	2011	2012	2013	2014	2015
GMS	−233,623	−3,831,134	−15,737,998	−15,784,755	−16,781,301	−24,631,612	−30,344,736	−36,259,715
Cambodia	104,322	395,421	1,287,199	2,089,430	2,387,386	2,430,348	2,062,031	1,449,254
China	135,254	−2,653,285	−12,460,693	−13,253,068	−16,198,990	−23,708,783	−28,719,251	−32,873,437
Lao PDR	−36,721	−28,337	−91,761	−173,444	−18,314	−245,538	−318,117	−63,177
Myanmar	2,073	−33,801	−53,301	−2,343	8,337	106,232	210,361	319,546
Thailand	−438,551	−1,511,132	−4,419,440	−4,445,329	−2,959,720	−3,213,870	−3,579,759	−5,091,901
Rest of the word	−920,162	−482,853	3,136,110	5,940,575	17,530,041	24,631,934	32,722,827	32,500,599

(Source) Author's calculation using data from the World Integrated Trade Solution (WITS).

IV. Data and Econometric Model Specifications

A. Data and sample overview

The data used for our analysis were extracted, processed, and merged from a number of sources. Specifically, import and export volumes were retrieved from the World Integrated Trade Solution (WITS) database for the period 2000-2015. Data on geographical distance between Vietnam and its partners were obtained from the GeoDist Database provided by the Centre d'Études Prospectives et d'Informations Internationales (CEPII). These distances are between the geographic coordinates of the largest cities in each country. Data on the history of conflicts between Vietnam and its partners were collected from the Uppsala Conflict Data Program of Uppsala University, 2017. Data on members of WTO/GATT were taken from the WTO's homepage. Data on regional trade agreements (RTAs) were collected from Vietnam's Ministry of Planning and Investment. Data for other macroeconomic variables, unless otherwise noted, were retrieved from the World Development Indicators, provided by the World Bank.

Our sample size comprises 188 countries with whom Vietnam has a trading relationship. Table 4 defines the main variables, and Table 5 reports the summary statistics.

Table 4. Variable definitions and sources

Variables	Definition	Source
Ln (Export)	Natural logarithm of the total value of Vietnam's exports	The World Integrated Trade Solution (WITS)
Ln (Import)	Natural logarithm of the total value of Vietnam's imports	The World Integrated Trade Solution (WITS)
Ln (Total income)	Natural logarithm of Vietnam's GDP multiplied by a partner's GDP	Author's calculation using data from the World Development Indicators
Ln (Regional per capita income)	Natural logarithm of Vietnam's per capita income	The World Development Indicators database
Ln (Destination per capita income)	Natural logarithm of partner countries' per capita income	The World Development Indicators database
Ln (DIFGDP)	Natural logarithm of the absolute value of the difference between Vietnam's GDP and the partner's GDP	Author's calculation using data from the World Integrated Trade Solution (WITS)
Ln (Distance)	Natural logarithm of the weighted distance between Vietnam's largest city and that of the partner country	The GeoDist Database provided by the CEPII
Trade Openness	The share of total exports and imports to real GDP	Author's calculation using data from the World Development Indicators
Conflict	Dummy variable, coded 1 if the partner has a history of conflict with Vietnam, and 0 otherwise.	Uppsala Conflict Data Program of Uppsala University
Contiguous border	Dummy variable, coded 1 if Vietnam and the partner have an inland border, and 0 otherwise.	The GeoDist Database provided by the CEPII
Trade Agreement	Dummy variable, coded 1 if Vietnam and the partner have a Trade Agreement, and 0 otherwise.	Vietnam's Ministry of Planning and Investment

(Source) Authors' compilation

Table 5. Summary statistics

Variable	Obs.	Mean	St. Dev.	Min	p.25	Median	p.75	Max
Ln (Export)	2452	16.476	3.051	6.297	14.408	16.588	18.514	24.234
Ln (Import)	2219	16.198	3.331	0.693	14.224	16.382	18.525	24.624
Ln (Total income)	2,397	48.901	2.628	40.599	47.021	48.870	50.718	56.515
Ln (Regional per capita income)	2,452	6.834	0.586	5.962	6.234	6.923	7.388	7.633
Ln (Destination per capita income)	2,397	8.285	1.593	4.713	6.987	8.301	9.562	11.543
Ln (DIFGDP)	2,408	25.227	1.307	16.786	24.362	25.210	25.789	30.517
Ln (Distance)	2,452	8.997	0.665	6.280	8.823	9.105	9.394	9.868
Trade Openness	2,452	1.434	0.205	1.114	1.275	1.453	1.597	1.788

(Source) Authors' compilation

B. The gravity model of trade

Based on the literature (Kahouli & Maktouf, 2015; Narayan & Nguyen, 2016), we utilized the traditional gravity model of trade to evaluate Vietnam's trade with partners. We start with

the earliest model proposed by Tinbergen (1962):

$$Trade_{ij} = G * \frac{GDP_i * GDP_j}{Distance_{ij}} \tag{1}$$

Equation (1) explains the volume of bilateral trade flows ($Trade_{ij}$) between country i and j (where i is Vietnam and j is its trading partner country), depending on: the GDP of country i (GDP_i); the GDP of country j (GDP_j); and the geographical distance between the two countries ($Distance_{ij}$). Additionally, the gravity model consists of a gravitational constant, G, which is independent of both i and j, and captures country-independent effects.

Based on (1), we estimate the following equation:

$$\ln(Trade)_{ij} = \alpha_0 + \alpha_1 \ln(GDP_i * GDP_j) + \alpha_2 \ln(Distance)_{ij} + \mu_{ij} \tag{2}$$

Equation (2) is the simplest form of the gravity model. However, this specification has been criticized for being incomplete since it disregards multilateral resistance factors to trade such as trade agreements, common language, common colonial base, remoteness, and adjacency (Anderson and Wincoop, 2003). Thus, we follow the literature by incorporating variables capturing economic, demographic, geographic conditions, and trade-creating policies, in order to model bilateral trade flow more accurately between Vietnam and its partners. Specifically, based on the literature (Kastner, 2007; Cipollina & Salvatici, 2010; Kahouli & Maktouf, 2015; Narayan & Nguyen, 2016) we include Vietnam's GDP per capita; the GDP per capita of the partner countries; the difference in GDP between Vietnam and its trading partners; trade openness; conflict; contiguous borders; and trade agreements. It is worth noting that other studies (Oh & Selmier II, 2008; Kahouli & Maktouf, 2015; Lewer & Van den Berg, 2008) use colonial links and common language; however as far as we are concerned, there are no common languages or colonial links between Vietnam and its trading partners.

As our main focus, we include a dummy variable indicating the GMS, which allows us to explicitly evaluate the trade flow of Vietnam with other GMS members compared with other regions. Thus, the model to estimate Vietnam's trade is specified as:

$$\begin{aligned} \ln(Trade)_{ij} = {} & \alpha_0 + \alpha_1 \ln(GDP_i * GDP_j) + \alpha_2 \ln(Regional\ per\ capita\ income)_i \\ & + \alpha_3 \ln(Destination\ per\ capita\ income)_j + \alpha_4 \ln(DIFGDP)_{ij} \\ & + \alpha_5 \ln(Distance)_{ij} + \alpha_6 Trade\ Openness_i + \alpha_7 Conflict_{ij} \\ & + \alpha_8 Contiguous\ Border_{ij} + \alpha_9 Trade\ Agreement_{ij} + \alpha_{10} GMS + \mu_{ij} \end{aligned} \tag{3}$$

Where $Trade_{ij}$ is the trade flow between countries i and j. Here, we separately consider

trade in terms of the total volume of Vietnam's exports to partner countries, and the total volume of Vietnam's imports from partner countries. GDP_i and GDP_j are the GDP of countries i and j, respectively. *Regional per capita income$_i$* and *Regional per capita income$_j$* indicate the GDP per capital of country i and country j, respectively. $DIFGDP_{ij}$ is the absolute value of the difference in GDP between country i and country j. $Distance_{ij}$ is the geographical distance between two countries i and j. *Trade Openness* reflects the level of openness in terms of trade, measured by the sum of total exports and imports divided by total GDP. $Conflict_{ij}$ notes an historical conflict between countries i and j, equal to 1 if conflict has existed, and 0 otherwise. *Contiguous Border$_{ij}$*, a dummy variable equal to 1 if countries i and j share a common border, and 0 otherwise. *Trade Agreement$_{ij}$* describes the Free Trade Agreement (FTA) between countries i and j. A dummy variable, it equals 1 if both countries i and j have signed the FTA, and 0 otherwise. *GMS* is a univariate variable indicating the Greater Mekong Sub-region. μ_{ij} denotes the residual term.

V. Empirical Results - Baseline Regressions

The gravity model has traditionally been estimated cross-sectionally. This approach has been criticized for obtaining unreliable results since it might exclude or mis-measure trading pair-specific variables (Baldwin, 2006) and it might be unable to capture the relevant relationships between variables over time. To mitigate this problem, we estimate our gravity model with the utilization of time-series cross-sectional (panel) data.

The two common methods used in panel data analysis are fixed effects and random-effects. The former is used to surmount the problem of the traditional pooled cross-section method unable to cope with bilateral (exporter and/or importer) heterogeneity (Cheng & Wall, 2005; Anderson & Wincoop, 2003). However, this approach does not allow for the inclusion of key exporter and importer invariant factors, and subsequently excludes important economically relevant trade variables (Prehn et al., 2016). As our main focus is on time-constant variables, such as the Great Mekong Sub-region Cooperation, dummies indicating GMS member countries, and the geographical distance from Vietnam to its trading partners, the random-effects is more appropriate. Therefore, we follow the literature (Kavallari et al., 2008; Keum, 2010; Prehn et al., 2016) and employ a panel random-effects approach to evaluate the trade flows between Vietnam and other countries.

A. Exports

Table 6 displays the results obtained with the random-effects approach to analyzing the

determinants of Vietnamese exports. The dependent variable is the natural logarithm of export volume. Column 1 provides the results for Vietnam's export flows, estimated from the baseline regression, using a GMS dummy to evaluate the trade flow between Vietnam and the GMS members. To attain a more detailed analysis, we separately considered the trade volume between Vietnam and each GMS member by incorporating dummy variables indicating China, Laos, Cambodia, Myanmar, and Thailand into the specification. Columns 2-6 present the specification including only one of the GMS countries at a time.

Overall, the estimated coefficients of the explanatory variables *Ln (Total income)* and *Ln (Distance)* are consistent with the expected signs. The exports from Vietnam increase with the GDP of Vietnam and its trading partners ($p < 0.01$) and decrease with distance. In addition, the GDP per capita of the destination and regional countries are negatively associated with export volume because the estimated coefficients on *Ln (Regional per capita income)* and *Ln (Destination per capita income)* are negative and statistically significant at $p < 0.05$ and $p < 0.01$, respectively. We further find that a larger difference in economic size (*DIFGDP*) between countries is positively related to export flows since the estimated coefficient on *Ln (DIFGDP)* is positive and statistically significant at $p < 0.1$. Moreover, the relationships between trade openness and contiguous borders, as well as trade agreements and Vietnam's exports, are positive and significant.

Regarding the regional dummies, since the estimated coefficient on *GMS* is negative and statistically significant (Column 1), it indicates that the level of goods and services exported from Vietnam to GMS member countries is below the normal level. Specifically, the export flow from Vietnam to GMS members is 62.4 percent [exp (-0.977) -1 = -0.624] lower than the normal level predicted by the countries' GDP, the distance between them, and multilateral resistance factors.

Results from Columns 2-6 indicate that the level of exporting to China and Myanmar is significantly lower than the normal level, whereas exports to Cambodia are significantly higher. It is worth noting that China is a main trading partner of Vietnam, with the largest proportion of total exports compared to other countries within the GMS. However, the estimated coefficient on the *China* dummy indicates that the volume of exports to China is 87.2 percent [exp (-2.057) = -0.872] lower than the normal level.

Table 6. Determinants of vietnam's exports

	Exports					
	(1)	(2)	(3)	(4)	(5)	(6)
Ln (Total income)	0.935***	0.937***	0.933***	0.934***	0.934***	0.933***
	(0.047)	(0.047)	(0.047)	(0.047)	(0.047)	(0.047)
Ln (Regional per capita income)	−0.980**	−0.986**	−0.982**	−0.984**	−0.976**	−0.982**
	(0.492)	(0.492)	(0.492)	(0.492)	(0.492)	(0.492)
Ln (Destination per capita income)	−0.242***	−0.240***	−0.236***	−0.236***	−0.243***	−0.236***
	(0.076)	(0.076)	(0.076)	(0.075)	(0.076)	(0.075)
Ln (DIFGDP)	0.113*	0.112*	0.112*	0.113*	0.112*	0.112*
	(0.060)	(0.060)	(0.060)	(0.060)	(0.060)	(0.060)
Ln (Distance)	−0.104	−0.102	−0.089	−0.089	−0.093	−0.089
	(0.215)	(0.214)	(0.214)	(0.214)	(0.214)	(0.216)
Trade Openness	3.210***	3.214***	3.216***	3.217***	3.207***	3.216***
	(1.197)	(1.197)	(1.197)	(1.197)	(1.197)	(1.197)
Conflict	0.319	0.720**	0.239	0.442	0.320	0.251
	(0.441)	(0.302)	(0.479)	(0.366)	(0.441)	(0.468)
Contiguous border	2.379***	2.224***	1.665**	1.038*	1.430**	1.628**
	(0.726)	(0.636)	(0.825)	(0.547)	(0.608)	(0.662)
Trade Agreement	2.415***	2.017***	2.188***	2.126***	2.404***	2.173***
	(0.629)	(0.611)	(0.597)	(0.585)	(0.593)	(0.616)
GMS	−0.977*					
	(0.758)					
China		−2.057***				
		(0.643)				
Laos			−0.128			
			(0.768)			
Cambodia				1.669***		
				(0.455)		
Myanmar					−1.724***	
					(0.450)	
Thailand						0.080
						(0.508)
R-squared	0.6464	0.6463	0.6463	0.6463	0.6464	0.6463
Observations	2,397	2,397	2,397	2,397	2,397	2,397

(Note) (i) Constant terms are not reported for brevity
　　　 (ii) Robust standard errors are in parentheses
　　　 (iii) *, **, *** indicate the significance level at 10%, 5%, and 1%, respectively

B. Imports

Table 7 displays the results obtained via the random-effects approach to analyze the determinants

of Vietnamese imports from GMS members. The dependent variable is the natural logarithm of the import volume.

The regression in column 1 displays results with the incorporation of the GMS regional

Table 7. Determinants of vietnam's imports

	Imports					
	(1)	(2)	(3)	(4)	(5)	(6)
Ln (Total income)	0.833***	0.832***	0.834***	0.833***	0.834***	0.831***
	(0.067)	(0.068)	(0.068)	(0.068)	(0.068)	(0.067)
Ln (Regional per capita income)	0.964	0.966	0.964	0.965	0.969	0.967
	(0.591)	(0.591)	(0.591)	(0.591)	(0.592)	(0.592)
Ln (Destination per capita income)	−0.019	−0.019	−0.021	−0.020	−0.025	−0.017
	(0.099)	(0.100)	(0.100)	(0.100)	(0.100)	(0.099)
Ln (DIFGDP)	0.246***	0.247***	0.246***	0.246***	0.246***	0.246***
	(0.081)	(0.081)	(0.081)	(0.081)	(0.081)	(0.081)
Ln (Distance)	−0.347	−0.346	−0.352	−0.350	−0.353	−0.333
	(0.271)	(0.270)	(0.269)	(0.269)	(0.269)	(0.271)
Trade Openness	−1.891	−1.892	−1.893	−1.892	−1.899	−1.892
	(1.578)	(1.578)	(1.578)	(1.578)	(1.579)	(1.578)
Conflict	0.227	0.110	0.278	0.153	0.281	0.202
	(0.527)	(0.493)	(0.510)	(0.495)	(0.529)	(0.507)
Contiguous border	1.497*	1.476**	1.523***	1.906***	1.527**	1.795***
	(0.794)	(0.700)	(0.557)	(0.479)	(0.614)	(0.597)
Trade Agreement	2.418***	2.508***	2.447***	2.488***	2.595***	2.316***
	(0.842)	(0.798)	(0.762)	(0.755)	(0.797)	(0.776)
GMS	0.187					
	(1.030)					
China		0.567*				
		(0.794)				
Laos			0.333			
			(0.409)			
Cambodia				−0.756***		
				(0.271)		
Myanmar					−1.030	
					(0.638)	
Thailand						1.343**
						(0.640)
R-squared	0.4873	0.4873	0.4874	0.4874	0.4874	0.4874
Observations	2,185	2,185	2,185	2,185	2,185	2,185

(Note) (i) Constant terms are not reported for brevity
     (ii) Robust standard errors are in parentheses
     (iii) *, **, *** indicate the significance level at 10%, 5%, and 1%, respectively

dummy to examine the import flow into Vietnam from GMS members. To attain a more detailed result, we replicated the procedure in the Exports sub-section and separately incorporated dummy variables indicating China, Laos, Cambodia, Myanmar, and Thailand into the specification. Columns 2-6 present the specification including only one of the GMS countries at a time.

Overall, the signs of the coefficients of the two basic explanatory variables *Ln (Total income)* and *Ln (Distance)* comport with the classical results of the gravity model. We further find that the large difference in GDP between Vietnam and its trading partners resulted in an increase in Vietnam's import volume. In addition, the effects of a contiguous border, and trade agreement on Vietnam's imports are positive and statistically significant.

The estimated coefficients of the GMS regional dummy, although positive, are not statistically significant. And the estimated coefficients of *China* and *Thailand* are positive and significant, indicating that Vietnam's imports from China and Thailand are higher than the normal level. These results attest that China and Thailand account for a large proportion of Vietnam's total imports, and the import volume from these countries has increased significantly from 2000 to 2015. On the other hand, we find that Vietnam's imports from Cambodia are less than the normal level, as the estimated coefficient on *Cambodia* is negative and statistically significant.

Taken together, our results comport with Krongkaew (2004) who argued that when entering into cooperation with GMS members, smaller countries like Vietnam may not benefit from trade gains since the larger trading partners (e.g., Thailand and China) can take advantage of the size and market power to accrue all the gains from trade.

VI. Channels That Can Facilitate Trade

In this section, we investigate channels that help to facilitate Vietnam's trade with its partners, especially with the GMS, principally human capital enhancement and financial development.

A. Human capital

A large number of studies consider human capital as a critical factor in determining the growth of trade flows (Contractor & Mudambi, 2008; Levin & Raut, 1997; Gomez-Mejia, 1988). Levin and Raut (1997) found significant complementarities between export performance and human capital. In addition, Contractor and Mudambi (2008) examined the human capital investment and export performance of the top 25 service-outsourcing countries, finding that human capital significantly affects the exports of both services and goods. Based on the literature, we expect human capital enhancement to promote Vietnam's imports and exports.

To test this hypothesis, we incorporate into the baseline regression (3) a variable capturing

the human capital level in Vietnam, as well as its interaction term with the *GMS* dummy. Specifically, based on the literature we include the natural logarithm of the total number of university and college students in Vietnam to proxy for human capital. Next, we follow the procedure conducted in earlier sections of this study and examine whether human capital enhancement can yield a significant impact on the bilateral trade of Vietnam with each GMS member. We first estimate our specification for the export volumes. Then, we replicate this exercise for imports. Table 8 displays the combined results.

Overall, they reinforce our prior findings. The signs and magnitudes of key variables are largely unchanged even with different interaction terms incorporated into the model. The interaction terms themselves also provide some important insights. The estimated coefficients on *GMS*Human capital* are all positive and statistically significant for both exports and imports, indicating that the volume of exports and imports with countries in the GMS increases when human capital is enhanced. The interaction terms of *Human capital* with other GMS country dummies are always positive and significant, evidencing that human capital is an effective channel for promoting the trade flows of Vietnam.

B. Trade openness and financial development

Beck (2002) and Shahbaz and Rahman (2014) have asserted that development of the financial sector could facilitate trade flows. According to Rajan and Zingales (1998), and Svaleryd and Vlachos (2005), the development of the financial sector allows enterprises to access external funds more conveniently, by increasing the amount of accessible funds and reducing the cost of external financing. As a result, it could reduce the problem of liquidity shortage, and ultimately promote trade.

Another literature strand evidences the positive impact of trade openness on trading activities, especially exports (Arslan & Wijnbergen, 1993; Ahmed, 2000; Krueger, 1997), partly because trade liberalization diminishes anti-export bias and helps exports become more competitive in an international market. Hence, in this sub-section, we attempt to conduct another robustness check, examining whether trade openness and financial development affect Vietnam's trade. We follow Lee and Chang (2009) and use the ratio of liquid liabilities to GDP to proxy for financial development (*Financial development*), and incorporate it into Eq. (3), along with its interaction term with *Trade openness*. Table 9 displays the regression results.

While the interaction term between *Trade openness* and *Financial development* is positive and significant in all export models, the estimated coefficients of *Trade openness*Financial development* are insignificant in all import models. This indicates that while trade openness can facilitate Vietnam's exports of goods and services as the financial system becomes more developed, it has no significant impact on the country's import levels. As a result, financial

Table 8. The role of human capital in promoting trade

	Exports						Imports					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Ln (Total income)	0.945***	0.947***	0.944***	0.944***	0.945***	0.943***	0.805***	0.804***	0.807***	0.805***	0.808***	0.804***
	(0.047)	(0.047)	(0.047)	(0.047)	(0.047)	(0.047)	(0.067)	(0.068)	(0.068)	(0.068)	(0.068)	(0.067)
Ln (Regional per capita income)	−1.101	−1.091	−1.085	−1.080	−1.077	−1.076	1.097	1.121	1.121	1.124	1.122	1.131
	(2.047)	(2.045)	(2.045)	(2.045)	(2.044)	(2.044)	(1.250)	(1.251)	(1.250)	(1.251)	(1.251)	(1.250)
Ln (Destination per capita income)	−0.204***	−0.212***	−0.209***	−0.214***	−0.216***	−0.213***	0.067	0.054	0.051	0.048	0.051	0.051
	(0.075)	(0.074)	(0.074)	(0.074)	(0.075)	(0.074)	(0.099)	(0.099)	(0.099)	(0.098)	(0.099)	(0.098)
Ln (DIFGDP)	0.108**	0.110**	0.108**	0.109**	0.107**	0.107**	0.242***	0.244***	0.242***	0.243***	0.240***	0.240***
	(0.054)	(0.054)	(0.054)	(0.054)	(0.054)	(0.054)	(0.079)	(0.079)	(0.079)	(0.079)	(0.079)	(0.079)
Ln (Distance)	−0.080	−0.082	−0.066	−0.067	−0.071	−0.067	−0.268	−0.268	−0.273	−0.274	−0.275	−0.256
	(0.216)	(0.215)	(0.216)	(0.215)	(0.215)	(0.217)	(0.273)	(0.272)	(0.272)	(0.272)	(0.271)	(0.274)
Trade Openness	3.535	3.517	3.517	3.509	3.505	3.507	−1.916	−1.947	−1.950	−1.952	−1.952	−1.956
	(3.061)	(3.058)	(3.058)	(3.057)	(3.057)	(3.057)	(2.275)	(2.276)	(2.276)	(2.276)	(2.276)	(2.276)
Conflict	0.181	0.631**	0.117	0.363	0.208	0.157	0.170	0.017	0.222	0.146	0.249	0.199
	(0.465)	(0.314)	(0.502)	(0.372)	(0.459)	(0.486)	(0.511)	(0.464)	(0.498)	(0.483)	(0.520)	(0.494)
Contiguous border	2.379***	2.327***	1.760***	1.028*	1.509**	1.682**	1.520**	1.461**	1.703***	1.949***	1.628***	1.860***
	(0.723)	(0.663)	(0.874)	(0.554)	(0.639)	(0.687)	(0.741)	(0.620)	(0.563)	(0.484)	(0.580)	(0.554)
Trade Agreement	2.344***	1.963***	2.149***	2.079***	2.343***	2.131***	2.557***	2.701***	2.629***	2.654***	2.743***	2.486***
	(0.626)	(0.602)	(0.591)	(0.579)	(0.592)	(0.610)	(0.769)	(0.745)	(0.715)	(0.708)	(0.740)	(0.718)
Human capital	−0.105	−0.095	−0.095	−0.093	−0.094	−0.093	0.020	0.037	0.037	0.037	0.037	0.038
	(0.580)	(0.579)	(0.579)	(0.579)	(0.579)	(0.579)	(0.298)	(0.298)	(0.298)	(0.298)	(0.298)	(0.298)
GMS	−6.226***						−7.580***					
	(1.344)						(1.480)					
GMS* Human capital	0.340***						0.499***					
	(0.070)						(0.065)					
China		−10.020***						−5.807***				
		(0.923)						(1.212)				

Table 8. Continued

	Exports						Imports					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
China* Human capital		0.497***						0.424***				
		(0.038)						(0.062)				
Laos			−7.761***						−7.803***			
			(1.027)						(0.998)			
Laos* Human capital			0.479***						0.498***			
			(0.036)						(0.057)			
Cambodia				−0.792						−8.788***		
				(0.684)						(0.897)		
Cambodia* Human capital				0.168***						0.514***		
				(0.033)						(0.056)		
Myanmar					−5.949***						−10.106***	
					(0.682)						(0.923)	
Myanmar* Human capital					0.277***						0.585***	
					(0.043)						(0.061)	
Thailand						−3.432***						−4.785***
						(0.666)						(0.853)
Thailand* Human capital						0.223***						0.389***
						(0.032)						(0.050)
R-squared	0.6221	0.6209	0.6208	0.6200	0.6200	0.6202	0.4761	0.4732	0.4735	0.4736	0.4738	0.4733
Observations	2,397	2,397	2,397	2,397	2,397	2,397	2,185	2,185	2,185	2,185	2,185	2,185

(Note) (i) Constant terms are not reported for brevity
(ii) Robust standard errors are in parentheses
(iii) *, **, *** indicate the significance level at 10%, 5%, and 1%, respectively

Table 9. Openness, financial development, and trade

	Exports						Imports					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Ln (Total income)	0.935***	0.937***	0.933***	0.934***	0.934***	0.933***	0.833***	0.832***	0.834***	0.833***	0.834***	0.831***
	(0.047)	(0.047)	(0.047)	(0.047)	(0.047)	(0.047)	(0.067)	(0.068)	(0.068)	(0.068)	(0.068)	(0.067)
Ln (Regional per capita income)	8.033***	8.034***	8.038***	8.038***	8.034***	8.038***	−2.650	−2.650	−2.651	−2.650	−2.653	−2.648
	(3.089)	(3.089)	(3.090)	(3.090)	(3.089)	(3.089)	(2.771)	(2.772)	(2.771)	(2.771)	(2.771)	(2.772)
Ln (Destination per capita income)	−0.242***	−0.240***	−0.236***	−0.236***	−0.243***	−0.236***	−0.019	−0.019	−0.021	−0.020	−0.025	−0.017
	(0.076)	(0.076)	(0.076)	(0.075)	(0.076)	(0.075)	(0.099)	(0.100)	(0.100)	(0.100)	(0.100)	(0.099)
Ln (DIFGDP)	0.113*	0.112*	0.112*	0.113*	0.112*	0.112*	0.246***	0.247***	0.246***	0.246***	0.246***	0.246***
	(0.060)	(0.060)	(0.060)	(0.060)	(0.060)	(0.060)	(0.081)	(0.081)	(0.081)	(0.081)	(0.081)	(0.081)
Ln (Distance)	−0.104	−0.102	−0.089	−0.089	−0.093	−0.089	−0.347	−0.346	−0.352	−0.350	−0.353	−0.333
	(0.215)	(0.214)	(0.214)	(0.214)	(0.214)	(0.216)	(0.271)	(0.270)	(0.269)	(0.269)	(0.269)	(0.271)
Trade Openness	−23.962**	−23.978**	−23.974**	−23.981*	−23.953**	−23.974**	8.395	8.398	8.397	8.397	8.410	8.398
	(11.304)	(11.303)	(11.304)	(11.304)	(11.303)	(11.304)	(8.220)	(8.220)	(8.220)	(8.220)	(8.219)	(8.221)
Conflict	0.319	0.720**	0.239	0.442	0.320	0.251	0.227	0.110	0.278	0.153	0.281	0.202
	(0.441)	(0.302)	(0.479)	(0.366)	(0.441)	(0.468)	(0.527)	(0.493)	(0.510)	(0.495)	(0.529)	(0.507)
Contiguous border	2.379***	2.224***	1.665**	1.038*	1.430**	1.628**	1.497*	1.476*	1.523***	1.906***	1.527**	1.795***
	(0.726)	(0.636)	(0.825)	(0.547)	(0.608)	(0.662)	(0.794)	(0.700)	(0.557)	(0.479)	(0.614)	(0.597)
Trade Agreement	2.415***	2.017***	2.188***	2.126***	2.404***	2.173***	2.418***	2.508***	2.447***	2.488***	2.595***	2.316***
	(0.629)	(0.611)	(0.597)	(0.585)	(0.593)	(0.616)	(0.842)	(0.798)	(0.762)	(0.755)	(0.797)	(0.776)
Financial Development	−47.008***	−47.039***	−47.038***	−47.051***	−46.989***	−47.037***	19.113	19.116	19.119	19.116	19.148	19.116
	(16.843)	(16.841)	(16.843)	(16.844)	(16.843)	(16.842)	(16.647)	(16.648)	(16.647)	(16.648)	(16.648)	(16.649)
Trade Openness* Financial Development	24.352***	24.369***	24.369***	24.375***	24.342***	24.368***	−9.671	−9.674	−9.675	−9.673	−9.690	−9.674
	(9.091)	(9.090)	(9.091)	(9.091)	(9.091)	(9.091)	(8.431)	(8.431)	(8.431)	(8.431)	(8.431)	(8.432)
GMS	−0.977*						0.187					
	(0.758)						(1.030)					

Table 9. Continued

		Exports						Imports				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
China		−2.057***						0.567*				
		(0.643)						(0.794)				
Laos			−0.128						0.333			
			(0.768)						(0.409)			
Cambodia				1.669***						−0.756***		
				(0.455)						(0.271)		
Myanmar					−1.724***						−1.030	
					(0.450)						(0.638)	
Thailand						0.080						1.343**
						(0.508)						(0.640)
R-squared	0.6464	0.6463	0.6463	0.6463	0.6464	0.6463	0.4873	0.4873	0.4874	0.4874	0.4874	0.4874
Observations	2,397	2,397	2,397	2,397	2,397	2,397	2,185	2,185	2,185	2,185	2,185	2,185

(Note) (i) Constant terms are not reported for brevity.
(ii) Robust standard errors are in parentheses.
(iii) *, **, *** indicate the significance level at 10%, 5%, and 1%, respectively

development could be an important channel that facilitates Vietnam's exports and helps reduce its reliance on imports, thus mitigating the trade deficit.

The signs of their coefficients of the other variables largely comport with our prior findings when we include *Financial Development* and its interaction term with *Trade Openness* into the Eq. (3).

VII. Conclusion and Policy Implications

The nexus between regional economic cooperation and trade gain has been studied by many researchers. Although researchers and policy makers have investigated this nexus theoretically (Fernandez and Portes, 1998; Iyoha, 2005) and empirically (Aitken, 1973; Yang & Gupta, 2008; Yang & Martinez-Zarzoso, 2014), their findings have not reached a consensus.

China's recently proposed BRI has revived the debate on the effectiveness of regional cooperation. Since the impact of regional economic cooperation on trade outcomes is contingent upon country-specific features (e.g., economic size) and capacities (the level of financial development and human capital), it is vital that economists and policymakers conduct more in-depth investigations on whether and through which channels cooperation facilitates or impedes trade. Our paper responds to this need by empirically assessing the trade relations between Vietnam and its GMS partners.

Using the gravity model of trade on a large sample of Vietnam and its trading partners during the period 2000-2015, we found that regional economic cooperation in the GMS did not facilitate Vietnam's trade as expected, as evidenced by perennial trade deficits. Specifically, Vietnam's exports with GMS members are far below the level predicted by distance, relative economic size, and development. For example, we found that Vietnam's exports to China - its largest trading partner - and Myanmar are much lower than the expected level, whereas the total value of Vietnam's imports from China and Thailand is above the normal level. We also found that human capital enhancement and financial development are two important channels that facilitate Vietnam's trade and help mitigate its trade deficits.

Our study recommends policies to stimulate trade flows. The empirical results may help the Vietnamese government identify the benefits and costs of participating in GMS cooperation, subsequently developing an appropriate trade strategy. In addition, we recommend that governments of small and developing countries like Vietnam should devote more effort to improving their financial systems, and invest in human capital in order to encourage domestic production, improve the quality of the labor force, and lessen their dependence on imports from other countries.

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