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Does the trade gravity model depend on trading partners? Some evidence from Vietnam and her 54 trading partners

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ABSTRACT

This paper finds that the influence of trade gravity variables is dependent on trading partners. For instance, trade with rich nations is more sensitive to distance, economic size, and trading partners, openness of trading partners, and exchange rate, than trade with low income nations. Nonetheless, the paper suggests that the trade policy should not ignore the importance of the level of development, maintenance of close economic ties, and the influence of the ASEAN, APEC, and the WTO on trade in the long and short run. This is found for the bilateral trade relations between Vietnam and her top 54 trading partners over the period 1986 to 2010.

1. Introduction

Vietnam has emerged from the war of 1962–1975, and a command economic system since the late 1980s, to become one of the most dynamic economies in the South East Asian region. Economic recovery after the Vietnam War was stifled by the command economic system until 1986 when the government took measures through the 'renovation' process. This process allowed Vietnam to embrace a market-based economic system and made way for faster economic recovery and nation building. In fact, over the period 1990–2010, the Vietnamese economy grew steadily at an annualized average rate of 7.3% and living standards, in terms of per capita income, increased fivefold through the period (World Bank, 2012).

Vietnam's economic performance after its renovation is a reflection of its foreign trade growth.[1] Vietnam's total trade as a percentage of gross domestic product (GDP) stood at 61.1% in 1991; rose to 67.2% in 1995; and reached a high of 159% in 2008 (World Bank, 2011). The key turning points in Vietnam's attempts to access the Asian region and the rest of the world came with the lifting of the US trade embargo in 1994, joining the Association of Southeast Asia Nations (ASEAN) in 1995 and the World Trade Organization (WTO) in 2007.

The growth in Vietnam's foreign trade has drawn some attention from researchers seeking to understand the causes of this phenomenon. Thanh and Duong (2011) assert that the boom in Vietnamese trade volume is related to the improvements in national

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[1] We provide more details on Vietnam's trade in the next section.

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competitiveness and international trade opportunities. On the other hand, Sajid and Nguyen (2010) highlight the role of foreign investment flows in boosting Vietnam's export capacity. Le, Nguyen, and Bandara (1996) argue that the large trade volumes between Vietnam and Asia-Pacific countries in the early stages of trade liberalization can be explained by economic size, economic development level and geographical distance.

This study also takes a similar route but comprehensively examines bilateral trade relationships between Vietnam and her top 54 trading partners within the gravity model. The gravity model has been frequently applied to analyze international trade. However, the scope of much of these studies has been limited to examining trade relations within a region or a trading block (see Anderson and Wincoop (2003); Eaton and Kortum (2002); Elliott and Ikemoto (2004); Feenstra, Markusen, and Rose (1998); Haveman and Hummels (2004); Lawless (2010); Limão and Venables (2001); McCallum (1995)). A few studies have examined the trade gravity model against a group of trading partners (see, Antonucci and Manzocchi (2006); Batra (2006); Blomqvist (2004); Bussiere and Schnatz (2009); Jinhwan and Orgilbold (2011); Nguyen (2010); Paas (2000); Sohn (2005); Wall (1999)). On Vietnam, we found only one study, Nguyen (2010), which examined Vietnamese bilateral exports using the panel gravity approach.[2] Our contribution to the gravity model literature comes in the following manner.

First, while researchers have extensively examined bilateral trade with a trading partner or a group of trading partners, not much has been done to compare the differences in the sensitivity of the gravity variables to different trading partners. As a result, it is not clear whether gravity bilateral trade variables are more sensitive to rich or low income trading partners or to trading partners residing in Asia or Africa. The key objective of our paper is to explore this issue.

We focus on Vietnam and the bilateral trade relations with her top 54 trading partners during the period 1986 to 2009. We engage in panel analyses but, unlike the extant literature, we divide the 54 bilateral trade relations of Vietnam into several panels depending on the geographical location and income level of the trading partner countries (see Table 4).[3] This allows us to draw out the income and regional differences between the trading partners and test the sensitivity of the gravity variables to trading partners. We have not seen a comparison such as this in the literature so far.

Second, the role of multilateral trade agreements is important to the economic integration process, but in the case of Vietnam has received limited attention.[4] The influence of ASEAN and Asia-Pacific Economic Cooperation (APEC) has received some attention in Nguyen (2010). But contrary to expectations, Nguyen (2010) found that ASEAN and APEC have had a negative influence on Vietnam's exports. Evidence on the influence of the WTO on Vietnam's trade is absent. In this study we account for the influence of Vietnam's three key multilateral trade arrangements (namely, the ASEAN, APEC, and the WTO memberships) on Vietnam's bilateral trade relations.

Third, often two or three income variables (per capita income, product of per capita incomes, and/or the difference of per capita incomes) are added in the extended or generalized gravity model (see Frankel (1992); MinKyoung, Cho, and Koo (2003); Nguyen (2010); Rahman and Dutta (2003); Sandberg, Seale, and Taylor (2006); Walsh (2006)). These variables have strong economic significance, but are highly correlated and pose multicollinearity problems (see Section 3). Estimation of a model with multicollinear variables leads to inaccurate estimation of parameters (see Vogelvang (2005)). We take a novel, yet simple, approach to avoiding this multicollinearity problem that is usually present in the gravity model by estimating the gravity model with one income variable at a time (see Eqs. (4), (5) and (6)). We find that our approach is robust in so far as deriving consistent results across income and geography panels.

Fourth, we engage in unit root and cointegration analyses to derive the long- and short-run gravity models by income and region. The short-run gravity models in this paper are based on the error correction framework. This is the first study to examine the gravity model and the related theories within this setting.[5]

Foreshadowing our key results, we find that gravity variables are sensitive to trading partners. Our long- and short-run analyses suggest that growth in Vietnamese bilateral trade, be it nominal or real, has been encouraged by higher incomes of both the exporting and importing nations, shorter trading distances, depreciation of the Dong against trading partner currency, and engaging in trade with APEC, and ASEAN members. Our study shows that the long- and short-run effects of these variables in nearly all cases are much stronger when Vietnam traded with rich trading partners.[6] Distance, in particular, is a variable that defines the gravity model but this study reveals that trade with rich countries is more sensitive to distance than trade with low income countries. Our regional analyses confirm that bilateral trade is more sensitive to distance if trade is between Vietnam and high income countries in Asia, Europe, and America and Oceania; and less sensitive if trade is with countries in Africa and the low income Asian group.

Both nominal and real trade patterns over the long- and short-term suggest that Vietnam's trade with rich trading partners follows the H-O theory which suggests trade engagements between countries with different factor endowment. From the regional analyses,

[2] Nguyen (2010) is relatively smaller than ours as it is only concerned with top 15 trading partners over the period from 1986 to 2006. He applied an augmented gravity model of export flows for Vietnam, which incorporated lagged export volume, Vietnam's GDP, trading partner's GDP, Vietnamese bilateral exchange rates, geographical distances between Vietnam and trading partners, and the ASEAN dummy. The study found that the lagged volume of bilateral export flows and nominal bilateral exchange rates has substantial impacts on current exports. An increase in GDPs in both Vietnam and its trading partners and depreciation of Vietnam's currency against trading partner currency was found to encourage bilateral trade volume. On the other hand, bilateral distance had a negative influence on export. Interestingly, the ASEAN dummy is found to have a negative effect – suggesting that Vietnam is likely to trade more with partners outside the ASEAN.

[3] The key advantage of the panel approach lies in accounting for the endogeneity problem that is encountered in estimating gravity equations. See, Baier and Bergstrand (2007) for the endogeneity problem associated with estimating gravity models.

[4] See Anderson and Wincoop (2003) on the theoretical importance of multilateral resistance factors, including trade agreements.

[5] We also examine the bilateral trade relationships in real as well as nominal settings. The purpose here is to evaluate whether the nominal and real approaches already taken by the literature are comparable or not. Some studies that use real trade models include Baier and Bergstrand (2007), Ghosh and Yamarik (2004), and Emla et al. (1999), while selected papers that have taken the nominal trade approach include Sohn (2005), Guilot (2010)and Lawless (2010).

[6] See Table 3 for the definition of and the group of countries that make up Vietnam's rich trading partners.