NEW TRADE THEORY: NEW EVIDENCE FROM VIETNAM

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ABSTRACT

This paper employs Gravity model, first used by Tinbergen (1962), and a panel data of country pairs between Vietnam and her 18 major/stable trading partners in the period from 1995 to 2011. This purpose was to assess the impact of the "index of similarity in GDP size" (SIMSIZE in short) on imports and exports of Vietnam. The empirical results show that the index of similarity in GDP size promotes strongly Vietnam's exports. By contrast, there is no evidence that demonstrates convincingly that this index induces the country's imports. These investigations can somewhat contribute to the existing literature on the "New Trade Theory", which was initiated in the late 1970s and in the early 1980s, in terms of testable implications from gravity models that are emphasized in the case study between some developing countries.

Keywords: Exports, imports, SIMSIZE, Gravity model, Hausman-Taylor estimator, New Trade Theory, Vietnam.

Lý thuyết thương mại quốc tế mới:
Bằng chứng kiểm định từ trường hợp của Việt Nam

TÓM TẮT

Bài báo này áp dụng mô hình Lực hấp dẫn, lần đầu tiên được sử dụng bởi Tinbergen (1962), và dữ liệu hỗn hợp (panel data) giữa Việt Nam và 18 đối tác thương mại quan trọng/ổn định trong giai đoạn từ 1995 đến 2011. Mục đích để đánh giá tác động của "chỉ số tương đồng về quy mô GDP" tới xuất và nhập khẩu của Việt Nam. Kết quả thực nghiệm cho thấy chỉ số tương đồng về quy mô GDP tác động làm tăng xuất khẩu của Việt Nam (Việt Nam có xu hướng xuất khẩu nhiều hơn sang các nước có sự tương đồng về quy mô GDP). Ngược lại, không có bằng chứng thuyết phục rằng chỉ số này có tác động làm tăng nhập khẩu của Việt Nam (Việt Nam không nhập khẩu nhiều từ các đối tác thương mại có quy mô GDP tương đồng). Kết quả nghiên cứu đã góp phần củng cố thêm cho sự tồn tại của Lý thuyết Thương mại Quốc tế mới (New Trade Theory), được khởi nguồn từ cuối những năm 1970 đầu những năm 1980, ở khía cạnh áp dụng mô hình kinh tế Lực hấp dẫn để kiểm chứng Lý thuyết Thương mại Quốc tế mới trong quan hệ thương mại giữa một số nước đang phát triển.

Từ khóa: Mô hình Lực hấp dẫn, nhập khẩu, Lý thuyết Thương mại Quốc tế mới, phương pháp ước lượng Hausman-Taylor, SIMSIZE (chỉ số tương đồng về quy mô GDP), Việt Nam, xuất khẩu.

1. INTRODUCTION

International trade can be defined as the exchange of capital, goods, and services across international borders or territories. In international trade, inter-industry trade is usually driven by differences in factor endowments (hence price) as stated in neoclassic theories such as the theory of Comparative Advantage of David Ricardo and the Hechsker -

Ohlin (H-O) theory of Eli Heckscher and Bertil Ohlin. One of the founding principles of these free trade models is the perfect competition principle, which suggests that multiple producers of goods competing with each other ultimately reduce prices for consumers and that this situation is the most beneficial for the society at large. This advantage might come due to natural factors within a country such as climate or natural resources, or those countries

might enjoy a labor advantage when producing a particular product. However, these theories/models fail to explain for the occurrence of intra-industry trade (IIT) - the two-way exchange of goods within standard industrial classifications. These include the facts that most trade is between countries with similar factor endowments and productivity levels and the large amount in overall trade in the globe is intra-industry trade of similar products. This has resulted in the formation of the "New Trade Theory" that tries to deal with those issues.

In the early 1980s, a new set of models gained prominence in international trade. Krugman (1979, 1980), Lancaster (1980), Helpman (1981), etc. studied a far-reaching implication of monopolistic competition for international trade theory.[1] To a large extent, this line of research as part of the New Trade Theory was motivated by two stylized facts that the traditional theories of international trade of Ricardo or Heckscher-Ohlin failed to explain. First, why does most world trade flows between developed countries that are similar in terms of endowments and technology levels? Second, why a major fraction of trade consists of intra-industry trade in similar products? Helpman and Krugman (1985) showed that a monopolistic competition model could explain both facts as long as firms produce differentiated products with increasing returns to scale[2] technology, and

as long as consumers have utility functions that reward diversity. There has been also an extensive empirical literature on trade in different products that in many instances preceded the New Trade Theory. The early work by Verdoorn (1960), Balassa (1966) and Grubel and Lloyd (1975) documented the growing two-way intra-industry trade between developed countries.[3] These empirical works, however, mostly lacked an explicit link to theoretical models. Against this background, Helpman (1987) has been an important contribution since the author has explicitly derived testable implications from a monopolistic competition model in order to explain the increasing trade to GDP ratios among developed nations. Particularly, Helpman predicts that countries exchange a larger fraction of output as they become more similar in terms of size and as their total size as a group increases, i.e. as they produce more varieties. Helpman's prediction plays an important role in the empirical literature that tests some implications of monopolistic competition models for aggregate trade patterns with country-level data. The econometric work of Hummels and Levinsohn's (1995) confirms Helpman's findings.

[4] Mauro (2000) also employed the size similarity variable to assess the impact of this factor on FDI flows and exports of selected countries (e.g., France, Germany, Italy, the UK, Japan, the USA, the Republic of Korea, Canada etc). The empirical results indicate the positive impact of this factor on both FDI flows and exports.

This suggests that the countries similar in size tend to trade and invest more to each other. Debaere (2005) stated that the increasing similarity in GDPs among OECD country pairs

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[1] Monopolistic competition is a type of imperfect competition that many producers sell products that are differentiated from one another as goods but not perfect substitutes (such as from branding, quality, or location). In monopolistic competition, a firm takes the prices charged by its rivals as given and ignores the impact of its own prices on the prices of other firms.

[2] In economics, **returns to scale** and **economies of scale** are related terms that describe what happens as the cale of production increases in the long run, when all input levels including physical capital usage are variable (chosen by firm). They are different terms and should not be used interchangeably. The returns to scale arise in the context of a firm's production function. It refers to changes in output resulting from a proportional change in all inputs (where all inputs increase by a constant factor). If output increases by that same proportional change then there are constant returns to scale. If output increases by less than that proportional change, there are decreasing returns to scale. If output increases by more than that proportional change, there are

increasing returns to scale. Notably, the returns to scale faced by a firm are purely technologically imposed and is not influenced by economic decisions or by market conditions.

[3] Debaere, P. (2005). Monopolistic competition and trade, revisited: testing the model without testing for gravity. Journal of International Economics 66, pp. 249-250.

[4] Debaere, P. (2005). Monopolistic competition and trade, revisited: testing the model without testing for gravity. Journal of International Economics 66, p. 250.

leads to higher bilateral trade to GDP ratios. The investigations of Mauro (2000) and Debaere (2005), again, provide some support for the prediction of Helpman (1987), whose model explains intra-industry trade that is prevalent among developed countries.

In contrast with the vast empirical studies of foreign researchers that have examined the impact of similarity in GDP size on trade or FDI flows between developed countries as mentioned above, the author hardly finds empirical studies examining the case between developing countries. This raises the research question that: Does the increasing similarity in GDPs among developing countries lead to higher bilateral trade between them? This inspires us to examine the case study of Vietnam. Vietnam offers an interesting case study for several reasons. First, there might not be empirical study that has ever examined the impact of the similarity in GDP size on foreign trade of Vietnam using economic models before. [5] Second, Vietnam has maintained the high growth rate of foreign trade since the launch of Renovation Policy in the late 1980s. Third, an understanding of the impact of the country similarity in size on Vietnam's foreign trade will be an important implication for the design of supporting trade policies. The hypothesis is that Vietnam will trade more with countries, which have the same GDP size with her, especially in export side. If this prediction holds true, this empirical study will provide some support for the "New Trade Theory". The remainder of this paper is organized as follows. The section 2 first analyzes briefly Vietnam's foreign trade from 1995 to 2011. Then, section 3 details gravity models and decrypts the data set (methodology and data). After that, section 4 presents the empirical results and discussions. The final section refers to some concluding remarks.

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5 For the case of Vietnam, after searching on many academic research sources such as Science Direct, Pro-Quest, EBSCO, Wiley Inter-science, IMF, WB, Google Scholars, no empirical study relating this topic has been found.

2. AN OVERVIEW ABOUT VIETNAM'S FOREIGN TRADE IN THE PERIOD FROM 1995 TO 2011

2.1. An overview of Vietnam's export markets

Table 1 illustrates Vietnam's exports by destinations during 1995 - 2011 in values. Generally, Vietnam's exports have concentrated on the Asia - Pacific region and EU. In 2000, Japan was the largest market with the export value of $ 2,575.2 million taking 17.78% of Vietnam's total exports. This was followed by the EU 5, ASEAN 4, China, Australia, Taiwan, the USA and the Republic of Korea. In 2006, we witness the appearance of the USA as the largest export market of Vietnam. The export value to the U.S. market increased from $ 732.8 million in 2000 to $ 7,845.1 million in 2006, more than tenfold over 6 years. Large as it is, the magnitude of the export response is no surprise given the big size of the U.S. market in the world market. Also this year, the EU, ASEAN, Japan, Australia, China, Taiwan and the Republic of Korea were the major export markets of Vietnam. In 2011, the USA still dominated the biggest market share of Vietnam's exports taking 17.47% totally. The proportions of the EU 5 and ASEAN 4 declined from 12.47% and 11.99% in 2006 to 11.11% and 8.71% in 2011, respectively. The ratio of Vietnam's exports to Japan also reduced from 13.15% to 11.12% in the same period. Vietnam's exports to Australia tended to decline gradually from 9.4% in 2006 to 2.6% in 2011 (calculated from figures in the Table 1). There were narrow changes in the cases of China, the Republic of Korea and Taiwan. Top 18 major export markets covered around 80% and the others shared about 20% of Vietnam's total exports in this duration.

2.2. An overview of Vietnam's import markets

Table 1. Value (current $ Million) of Vietnam's exports by destination during 1995 - 2011

Year	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Australia	55.4	64.8	230.4	471.5	814.6	1272.5	1041.8	1328.3	1420.9	1884.7	2722.8	3744.7	3802.2	4351.6	2386.1	2704	2519.1
Belgium	34.7	61.3	124.9	212.3	306.7	311.9	341.2	337.1	391.4	515.7	544.1	687.5	849	1019.2	831.7	848.8	1199.7
Canada	17.8	32.6	63.9	80.2	91.1	98.7	107.3	138.1	171.3	270.1	356	440.5	539.2	656.4	638.5	802.1	969.4
China	361.9	340.2	474.1	440.1	746.4	1536.4	1417.4	1518.3	1883.1	2899.1	3228.1	3242.8	3646.1	4850.1	5403	7308.8	11125.0
France	169.1	145	238.1	297.3	354.9	380.1	467.5	437.9	496.1	555.1	652.9	797.2	884.4	970.8	809.6	1095.1	1658.9
Germany	218	228	411.4	552.5	654.3	730.3	721.8	729	854.7	1064.7	1085.5	1445.3	1854.9	2073.4	1885.4	2372.7	3366.9
Hong Kong	256.7	311.2	430.7	318.1	235.7	315.9	317.2	340.2	368.7	380.1	353.1	453	582.5	877.2	1034.1	1464.2	2205.7
Japan	1461	1546.4	1675.4	1514.5	1786.2	2575.2	2509.8	2437	2908.6	3542.1	4340.3	5240.1	6090	8467.8	6335.6	7727.7	10781.1
Malaysia	110.6	77.7	141.6	115.2	256.5	413.9	337.2	347.8	453.8	624.3	1028.3	1254	1555	2030.4	1775.2	2093.1	2832.4
The Netherlands	79.7	147.4	266.8	304.1	342.9	391	364.5	404.3	493	581.9	659.2	857.4	1182.1	1577.4	1355.6	1688.3	2148.0
The Philippines	41.5	132	240.6	401.1	393.2	478.4	368.4	315.2	340	498.6	829	782.8	965.1	1824.7	1461.9	1706.4	1535.3
The Russian Federation	80.8	84.7	124.6	126.2	114.9	122.9	194.5	187.4	159.6	215.8	251.9	413.2	458.5	672	414.9	829.7	1287.3
Singapore	689.8	1290	1215.9	740.9	876.4	885.9	1043.7	961.1	1024.7	1485.3	1917	1811.7	2234.4	2713.8	2075.6	2121.3	2285.7
The Republic of Korea	235.3	558.3	417	229.1	319.9	352.6	406.1	468.7	492.1	608.1	663.6	842.9	1243.4	1793.5	2077.8	3092.2	4715.4
Taiwan	439.4	539.9	814.5	670.2	682.4	756.6	806	817.7	749.2	890.6	935	968.7	1139.4	1401.4	1120.6	1442.8	1843.3
Thailand	101.3	107.4	235.3	295.4	312.7	372.3	322.8	227.3	335.4	518.1	863	930.2	1030	1288.5	1314.2	1182.8	1792.2
The UK	74.6	125.1	265.2	335.8	421.2	479.4	511.6	571.6	754.8	1010.3	1015.8	1179.7	1431.3	1581	1329.2	1681.9	2398.2
The USA	169.7	204.2	286.7	468.6	504	732.8	1065.3	2452.8	3938.6	5024.8	5924	7845.1	10104.5	11886.8	11407.2	14238.1	16927.8
ASEAN 4	943.2	1607.1	1833.4	1552.6	1838.8	2150.5	2072.1	1851.4	2153.9	3126.3	4637.3	4778.7	5784.5	7857.4	6626.9	7103.6	8445.6
EU 5	576.1	706.8	1306.4	1702	2080	2292.7	2406.6	2479.9	2990	3727.7	3957.5	4967.1	6201.7	7221.8	6211.5	7686.8	10771.7
Top 18	4597.3	5996.2	7657.1	7573.1	9214	12206.8	12344.1	14019.8	17236	22569.4	27369.6	32936.8	39592	50036	43656.2	54400	71591.4
Others	851.6	1259.7	1527.9	1787.2	2327.4	2275.9	2685.1	2686.3	2913.3	3915.6	5077.5	6889.4	8969.4	12649.1	13440.1	17791.9	25314.3
Total	5448.9	7255.9	9185	9360.3	11541.4	14482.7	15029.2	16706.1	20149.3	26485	32447.1	39826.2	48561.4	62685.1	57096.3	72191.9	96905.7

Notes: ASEAN 4 includes Malaysia, the Philippines, Singapore and Thailand covering around 70% of Vietnam's total exports to ASEAN 9 during 1995-2011

EU 5 includes Belgium, France, Germany, the Netherlands and the United Kingdom (UK) covering about 70% of Vietnam's total exports to all EU members during 1995-2011

Source: Personally calculated from figures published by the Vietnam's General Statistics Office (GSO), 2012.

Table 2. Value (current $ Million) of Vietnam's imports by sources during 1995 - 2011

Year	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Australia	100.6	132.8	192.6	253.9	215.7	293.5	266.4	286.3	278	458.8	498.5	1099.7	1059.4	1357.9	1045.9	1443.6	2123.3
Belgium	21.7	59.9	80	69.5	85.2	92	72.2	94.7	167.8	137.6	171.2	225.4	312.2	348.3	300.9	320.2	346.9
Canada	24.9	35.1	36.9	41.3	49.5	37.6	56.8	63.7	76.6	96.8	173.6	178.6	287.2	297.8	235.8	349.3	342.1
China	329.7	329	404.4	515	673.1	1401.1	1606.2	2158.8	3138.6	4595.1	5899.7	7391.3	12710	15973.6	15411.3	20018.8	24593.7
France	276.6	416.8	550.8	379.8	309.3	334.2	300.4	299.2	411	617.4	447.7	421.1	1155.4	816.5	753.9	969	1205.0
Germany	175.5	288.2	280.8	359.9	268.7	295.2	396.7	558.1	614.6	694.3	661.9	914.5	1308.5	1479.9	1421.5	1742.4	2198.6
Hong Kong	419	795.4	598.9	557.3	504.7	598.1	537.6	804.8	990.9	1074.3	1235	1440.8	1950.7	2633.3	2120.9	860.4	969.7
Japan	915.7	1260.3	1509.3	1481.7	1618.3	2300.9	2183.1	2504.7	2982.1	3552.6	4074.1	4702.1	6188.9	8240.3	6836.4	9016.1	10400.3
Malaysia	190.5	200.3	226.8	249	305	388.9	464.4	683.3	925	1215.3	1256.5	1482	2289.9	2596.1	2561.3	3413.4	3919.7
The Netherlands	36.3	51.4	51.5	54	48.5	84.6	114.6	114.3	324.9	179.4	312.1	360.8	510.3	710.5	701.4	527.8	669.4
The Philippines	24.7	28.9	36.3	67.7	47.5	62.9	53.5	100.6	140.9	188.4	209.9	342.6	414.2	389.1	450.7	700.3	805.1
The Russian Federation	144.8	186.5	158	216.3	245.6	240.5	376.4	500.6	491.8	671.5	766.6	455.8	552.2	969.6	1288.1	999.1	694.0
Singapore	1425.2	2032.6	2128	1964	1878.5	2694.3	2478.3	2533.5	2875.8	3618.4	4482.3	6273.9	7613.7	9378	7015.2	4101.1	6390.6
The Republic of Korea	1253.6	1781.4	1564.5	1420.9	1485.8	1753.6	1886.8	2279.6	2625.4	3359.4	3594.1	3908.4	5340.4	7255.2	6707.6	9761.3	13175.9
Taiwan	901.3	1263.2	1484.7	1377.6	1566.4	1879.9	2008.7	2525.3	2915.5	3698.3	4304.2	4824.9	6946.7	8362.6	6112.9	6976.9	8556.8
Thailand	439.8	494.5	575.2	673.5	561.8	810.9	792.3	955.2	1282.2	1858.6	2374.1	3034.4	3744.2	4905.6	4471.1	5602.3	6383.6
The UK	50.7	83.7	103.9	96.4	109.2	149.9	171.6	166.5	219.8	227.7	182.4	202.1	237	386.3	342.5	511.1	646.1
The USA	130.4	245.8	251.5	324.9	322.7	363.4	410.8	458.3	1143.3	1133.9	862.9	987	1700.5	2646.6	2710.5	3766.9	4529.2
ASEAN 4	2080.2	2756.3	2966.3	2954.2	2792.8	3957	3788.5	4272.6	5223.9	6880.7	8322.8	11132.9	14062	17268.8	14498.3	13817.1	17499
EU 5	560.8	900	1067	959.6	820.9	955.9	1055.5	1232.8	1738.1	1856.4	1775.3	2123.9	3523.4	3741.5	3520.2	4070.5	5066
Top 18	6861	9685.8	10234.1	10102.7	10295.5	13781.5	14176.8	17087.5	21604.2	27377.8	31506.8	38245.4	54321.4	68747.2	60487.9	71080	87950
Others	1294.4	1457.8	1358.2	1396.9	1446.6	1855	2041.2	2658.1	3651.6	4591	5254.3	6645.7	8443.3	11966.6	9460.9	13721.2	18799.9
Total	8155.4	11143.6	11592.3	11499.6	11742.1	15636.5	16218	19745.6	25255.8	31968.8	36761.1	44891.1	62764.7	80713.8	69948.8	84801.2	106749.9

Notes: ASEAN 4 includes Malaysia, the Philippines, Singapore and Thailand covering around 90% of Vietnam's total imports from ASEAN 9 during 1995-2011; EU 5 includes Belgium, France, Germany, the Netherlands and the United Kingdom (UK) covering about 70% of Vietnam's total imports from all EU members during 1995-2011
Source: Personally calculated from figures published by the Vietnam's General Statistics Office (GSO), 2012.

Table 2 presents Vietnam's imports by sources during 1995 - 2011 in values. On import side, a similar trend can be easily observed for the changes in the relative importance in order of some main import sources of Vietnam. Vietnam's imports have mainly concentrated on the Asia - Pacific region and the EU due to its integration focusing on these regions. In contrast to export side, the USA was not the biggest import source of Vietnam, while China, ASEAN 4, the Republic of Korea, Japan and Taiwan were the major important import sources. Specifically, the proportion of Vietnam's import from the USA was only 2.32% in 2000, 2.2% in 2006 and 4.24% in 2011. Vietnam's imports from China have increased steadily in both absolute value and ratio recently. The import value increased from $ 1,401.1 million in 2000 to $ 7,391.3 million in 2006 and $ 24,593.7 million in 2011. The share in its total imports rose from 8.96% in 2000 to 16.46% in 2006 and 23.04% in 2011. Although, the proportion of Vietnam's imports from ASEAN 4 has decreased from 24.79% in 2006 to 16.39% in 2011, ASEAN 4 was still the second largest import source of Vietnam just after China. This means, there was a "trade diversion" from ASEAN 4 to China in importation. Vietnam's import value from the Republic of Korea has increased from $ 3,908.4 million in 2006 to $ 13,175.9 million in 2011 covering 12.34% of its total imports. At the same period, the ratios of Vietnam's imports from Japan and the EU 5 remained stableof around 9.74% and 4.74% in order. Top 18 Vietnam's major import sources covered over 85% and the others shared around 15% of its total imports (calculated from figures in Table 2).

2.3. An overview about Vietnam's trade balance with its major trading partners

The Table 3 indicates the pattern of Vietnam's trade balance with its major trading partners from 1995 to 2011. It is obvious that trade deficit with China has grown up rapidly from $ 188.8 million in 2001 to $ 13,468.7 million in 2011 amounting over 100% of Vietnam's total trade deficit in the same year ($

9,844.2 million). [6] Vietnam continued to run substantial trade deficits with ASEAN 4, the Republic of Korea and Taiwan. Trade deficit with ASEAN 4 seems to be decreased but still stopped at high volume of about $ 9,053.4 million in 2011. In contrast, Vietnam had steady trade surplus with the USA, the EU 5 and Australia. In 2011, trade surplus with the USA and the EU 5 reached at $ 12,398.6 million and $ 5,705.7 million respectively. The trade surplus with Australia was $ 395.8 million in the same year. There has been a fluctuation in trade balance with Japan.

Overall, despite having the trade surplus with the USA, the EU 5, and Australia, Vietnam still had trade deficit in total trade balance. Vietnam's balance of trade deficit had experienced an upward trend together with the increase of trade size. Trade deficit has increased from $ 1,153.8 million in 2000 to $ 5,064.9 million in 2006 and stopped at $ 9,844.2 million in 2011, 8.53 times higher than that in 2000 and 1.94 times better in comparison with 2006.

Vietnam's trade deficit with its major trading partners recently could be explained as follows. Firstly, Vietnam's domestic producers have not met the demands in both manufacturing and final consuming yet. Secondly, the capacity of competition of domestic products is quiet limited. Those created the huge imports to satisfy domestic demands. Thirdly, it has resulted from the slow change of Vietnam export - import structure. Vietnam's economy still focuses on processing and assembling using cheap labor force but medium and low technology. Domestic manufacturing depends much upon the world's input material markets. 80 - 90% of input materials were imported from abroad covering two thirds of factory price. The increase of

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[6] To investigate why Vietnam imported much more from China leading to the trade deficit of the country, please read more on Hoang, C.C. (2013). "An analysis of trade balance between Vietnam and China", available on: http://www.hpu.edu.vn/tabid/94/HPU/khoahoc/ctrlID/1/ID/16644/Phan-tich-can-can-thuong-mai-Viet---Trung/Default.aspx, accessed on 23rd May 2013.

Table 3. Vietnam's foreign trade balance (current $ Million) with its major trading partners during 1995-2011

Trade Balance	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Australia	-45.2	-68	37.8	217.6	598.9	979	775.4	1042	1142.9	1425.9	2224.3	2645	2742.8	2993.7	1340.2	1260.4	395.8
Canada	-7.1	-2.5	27	38.9	41.6	61.1	50.5	74.4	94.7	173.3	182.4	261.9	252	358.6	402.7	452.8	627.3
China	32.2	11.2	69.7	-74.9	73.3	135.3	-188.8	-640.5	-1255.5	-1696	-2671.6	-4148.5	-9063.9	-11123.5	-10008.3	-12710	-13468.7
Hong Kong	-162.3	-484.2	-168.2	-239.2	-269	-282.2	-220.4	-464.6	-622.2	-694.2	-881.9	-987.8	-1368.2	-1756.1	-1086.8	603.8	1236
Japan	545.3	286.1	166.1	32.8	167.9	274.3	326.7	-67.7	-73.5	-10.5	266.2	538	-98.9	227.5	-500.8	-1288.4	380.8
The Russian Federation	-64	-101.8	-33.4	-90.1	-130.7	-117.6	-181.9	-313.2	-332.2	-455.7	-514.7	-42.6	-93.7	-297.6	-873.2	-169.4	593.3
The Republic of Korea	-1018.3	-1223.1	-1147.5	-1191.8	-1165.9	-1401	-1480.7	-1810.9	-2133.3	-2751.3	-2930.5	-3065.5	-4097	-5461.7	-4629.8	-6669.1	-8460.5
Taiwan	-461.9	-723.3	-670.2	-707.4	-884	-1123.3	-1202.7	-1707.6	-2166.3	-2807.7	-3369.2	-3856.2	-5807.3	-6961.2	-4992.3	-5534.1	-6713.5
The USA	39.3	-41.6	35.2	143.7	181.3	369.4	654.5	1994.5	2795.3	3890.9	5061.1	6858.1	8404	9240.2	8696.7	10471.2	12398.6
ASEAN 4	-1137	-1149.2	-1132.9	-1401.6	-954	-1806.5	-1716.4	-2421.2	-3070	-3754.4	-3685.5	-6354.2	-8277.5	-9411.4	-7871.4	-6713.5	-9053.4
EU 5	15.3	-193.2	239.4	742.4	1259.1	1336.8	1351.1	1247.1	1251.9	1871.3	2182.2	2843.2	2678.3	3480.3	2691.3	3616.3	5705.7
Top 18	-2263.7	-3689.6	-2577	-2529.6	-1081.5	-1574.7	-1832.7	-3067.7	-4368.2	-4808.4	-4137.2	-5308.6	-14729.4	-18711.2	-16831.7	-16680	-16358.6
Others	-442.8	-198.1	169.7	390.3	880.8	420.9	643.9	28.2	-738.3	-675.4	-176.8	243.7	526.1	682.5	3979.2	4070.7	6514.4
Total	-2706.5	-3887.7	-2407.3	-2139.3	-200.7	-1153.8	-1188.8	-3039.5	-5106.5	-5483.8	-4314	-5064.9	-14203.3	-18028.7	-12852.5	-12609.3	-9844.2

Notes: ASEAN 4 includes Malaysia, the Philippines, Singapore and Thailand

EU 5 includes Belgium, France, Germany, the Netherlands and the United Kingdom (UK)

Source: Personally calculated from figures published by the Vietnam General Statistics Office (GSO), 2012.

exports has been accompanied by the rise of imports from foreign markets. Vietnam's exports concentrated on raw material (*e.g.*, crude oil, coal, and iron ore etc), agriculture, forestry and aquatic products (*e.g.*, rice, coffee, cashew nut, pepper, catfish, etc.) and on some light industry products (*e.g.*, garment, textile, footwear, etc.) with low added value while it imported mostly input/manufacturing materials (*e.g.*, machines, equipments, instruments, parts and components, fuels, raw materials, etc.) and luxury consuming goods (automobiles, mobile phones, luxury cosmetics, computers, etc.), which covered over 70% of total imports. How to test the impact of the index of similarity in GDP size on exports and imports of Vietnam? The next section will present the methodology and data used to conduct this research.

3. THE SPECIFICATION OF GRAVITY MODELS AND DECRYPTING THE DATA SET

3.1. The specification of Gravity equations

The Gravity model in international trade presents a more empirical analysis of trading patterns. The gravity model, in its basic form, predicts trade based on the distance between countries and the interaction of the countries' economic sizes. The model mimics the Newtonian Law of gravity which also considers distance and physical size between two objects. The model has been proven to be empirically strong through econometric analysis and takes the following formula:

$$F_{ij} = G(M_i M_j)/D_{ij} \qquad (1)$$

wherein:

. F_{ij} is the bilateral trade flow between countr *i* and country *j*

. M_i is the economic mass of country i (often using GDP, GNP measurements)

. M_j is the economic mass of country j (often using GDP, GNP measurements)

. D_{ij} is the distance between countries (i and j), and

. G is a constant.

For further development, many other variables can be added in the model, such as transport and transaction costs; FDI inflows (FDI stock per capita); trade policies, exchange rate regime; cultural differences: colonial history, language diversity and literacy rate (%); institution, uncertainty; preference schemes: Generalized System of Preferences (GSP); limited overlap in consumer preference schemes; market access; openness; index of country similarity in size, economic size similarity, differences in relative endowments etc. The Gravity model has been used comprehensively in many empirical studies in international economics (*e.g.*, Poyhonen (1963); Linnemann (1966); Anderson (1979); Bergstrand (1985); Bayoumi and Eichengreen (1995); Deardorff (1998); Mauro (2000); Aderson and van Wincoop (2003); Rose (2004a); Subramanian and Wei (2007); Tomz et al. (2007); Shujiro and Misa (2007); Helpman et al. (2008); Eicher and Henn (2011); Pham (2011), Medvedev (2012) etc).

Notably, in a panel data setting, random-effects and fixed-effects models have been traditionally and widely used for the estimation of Gravity models. The choice between them is using the Hausman test. However, both methods have their own disadvantages. While the random-effects models do not incorporate country fixed-effects (which are likely to be presented in a heterogeneous country sample), time invariant variables will not yield coefficient estimates in a fixed-effects model. It means that we cannot acquire estimates for the coefficients of time invariant variables, although these can be quite interesting in a Gravity model, since they reveal the "distance" between two countries and reveal whether they "share a land border". As a remedy, Hausman and Taylor (1981) and Wyhowki (1994) proposed a different model that could incorporate the advantages of the random-effects and the fixed-effects models. Egger (2005) stated that the Hausman-Taylor estimator is consistent and the performance is at least equivalent to the random-effects and the fixed-effects estimators.

McPherson and Trumbull (2003) also tested different estimators and found the Hausman-Taylor estimator to be superior in the estimation results. From this perspective, the author will use the Hausman-Taylor estimator for the empirical analysis in this paper. The Hausman-Taylor estimator is basically a hybrid of the fixed - effects and the random - effects models and takes the following formula:

$$y_{it} = \beta_1 x'_{1it} + \beta_2 x'_{2it} + \alpha_1 z'_{1i} + \alpha_2 z'_{2i} + \varepsilon_{it} + u_i \quad (2)$$

In which, y_{it} reflects the dependent variable for country i in period/time/year t; x'_{1it} denotes variables that are time varying and uncorrelated with the error term in the random-effects model (u_i); x'_{2it} refers to a set of variables that are time varying and correlated with u_i; z'_{1i} represents the time invariant variables that are uncorrelated with u_i; z'_{2i} describes the time invariant variables that are correlated with u_i; β_i and α_i are the vectors of coefficients associated with the covariates; and ε_{it} is the random error with the hoping that its value is appropriate zero. My benchmark specification models take the following formulas:

$$LnEX_{jt} = \beta_{10} + \beta_{11}LnDIS_{VNj} + \beta_{12}LnGDP_{VNt} + \beta_{13}LnGDP_{jt} + \beta_{14}Ln[1- (GDP_{VNt}/(GDP_{VNt} + GDP_{jt}))^2 - (GDP_{jt}/(GDP_{VNt} + GDP_{jt}))^2] + \beta_{15}LnFDI_{jt-1} + \beta_{16}LnRER_{CURj/VNDt} + \beta_{17}Ln(ins_{VNt}*ins_{jt}) + \gamma_{11}FTA + \gamma_{12}Bothin_{VNjt} + \gamma_{13}Onein_{VNjt} + \gamma_{14}CRI_j^{1997} + \gamma_{15}CRI_j^{2008} + \gamma_{16}BOR_{VNj} + \varepsilon_{1VNj} \quad (3)$$

$$LnIM_{jt} = \beta_{20} + \beta_{21}LnDIS_{VNj} + \beta_{22}LnGDP_{VNt} + \beta_{23}LnGDP_{jt} + \beta_{24}Ln[1- (GDP_{VNt}/(GDP_{VNt} + GDP_{jt}))^2 - (GDP_{jt}/(GDP_{VNt} + GDP_{jt}))^2] + \beta_{25}LnFDI_{jt-1} + \beta_{26}LnRER_{CURj/VNDt} + \beta_{27}Ln(ins_{VNt}*ins_{jt}) + \gamma_{21}FTA + \gamma_{22}Bothin_{VNjt} + \gamma_{23}Onein_{VNjt} + \gamma_{24}CRI_j^{1997} + \gamma_{25}CRI_j^{2008} + \gamma_{26}BOR_{VNj} + \varepsilon_{2VNj} \quad (4)$$

In which:

EX_{jt} is the real Vietnam's exports to country j at year t in \$ (2005 price).

IM_{jt} is the real Vietnam's imports from country j at year t in \$ (2005 price).

DIS_{VNj} is the weighted distance between Vietnam and country j in km (CEPII work).

GDP_{VNt} is the real GDP of Vietnam at year t in \$ (2005 price).

GDP_{jt} is the real GDP of country j at year t in \$ (2005 price).

FDI_{jt-1} is the amount of implemented FDI capital of country j at year $t-1$ in Vietnam in \$ (2005 price). To avoid the endogenous issues such as the existence of bidirectional causality between the FDI and GDP variables in gravity models, the author uses a one time period lag for the FDI variable.

$RER_{CURj/VNDt}$ is the real bilateral exchange rate between Vietnam Dong (VND) and currency of country j at year t. The real exchange rate is calculated by the following formula:

$$RER_{CURj/VNDt} = e_{CURj/VNDt} * (CPI_{jt} /CPI_{VNt}) \quad (5)$$

In which:

$RER_{CURj/VNDt}$ is the Real exchange rate between VND and currency of country j at year t

$e_{CURj/VNDt}$ is the Nominal exchange rate between VND and currency of country j at year t (this expresses the number of VND used to exchange with 1 currency unit of country j at year t).

CPI_{jt} is the Consumer Price Index of country j at year t.

CPI_{VNt} is the Consumer Price Index of Vietnam at year t.

ins_{VNt} is the average value of government indicator of Vietnam at year t.

ins_{jt} is the average value of government indicator of country j at year t.

$ins_{VNt} * ins_{jt}$ is an institutional variable. In which, ins_{VNt} and ins_{jt} are the values of the governance indicators of Vietnam and country partner j respectively at year t. Each of them will be taken from the average of five indicators: (1) the Political Stability and Absence of Violence/Terrorism; (2) Government Effectiveness; (3) Regulatory Quality; (4) Rule of Law; and (5) Control of Corruption indicators, which are provided by the World Bank. Percentile rank among all countries ranges from

0 to 100. The higher figures mean better governance. The institutional variable in this study reveals the interaction in governance between Vietnam and country partners. It reveals that better governance may facilitate the exports and imports of Vietnam.

FTA is a binary dummy variable which is unity if Vietnam and country partner j have joined/signed a regional bilateral/plurilateral trade agreement at year t such as the AFTA, USBTA, ACFTA, AKFTA, JVEPA, AJCEP and the AANZFTA and otherwise. [7]

$Bothin_{VNjt}$ is a binary dummy variable which is unity if both Vietnam and country j are WTO members at year t and otherwise.

$Onein_{VNjt}$ is a binary dummy variable which is unity if either Vietnam or country j is a WTO member at year t and otherwise.

CRI_j^{1997} and CRI_j^{2008} are binary dummy variables. Each dummy will take the value of 1 if country j has been suffered from the 1997 Asian financial crisis or the 2008 global financial and economic crisis respectively and otherwise. The values of these variables are obtained from the work of Laeven and Valencia (2008) and some others (*e.g.*, Bartram and Bodnar (2009), Naudé (2009), Erkens et al. (2012), Rose and Spiegel (2012)).

BOR_{VNj} is a binary dummy variable which is unity if Vietnam and country j share the land border and otherwise.

$[1 - (GDP_{VNt}/(GDP_{VNt}+GDP_{jt}))^2 - (GDP_{jt}/(GDP_{VNt} + GDP_{jt}))^2]$ is the index of similarity in GDP size (SIMSIZE in short) that takes the value in the phase $(-\infty, -0.69)$. In case of perfect dissimilarity (GDP_{VN} has a huge difference with the GDP_j at year t), then $Ln[1 - (GDP_{VNt}/(GDP_{VNt} + GDP_{jt}))^2 - (GDP_{jt}/(GDP_{VNt} +$

$GDP_{jt}))^2] \approx \ln[1 - (0)^2 - (1)^2]$ or $\approx \ln[1 - (1)^2 - (0)^2] \approx$ ln (near Zero) = $-\infty$. In case of perfect similarity (GDP_{VN} has a very pretty/small difference with the GDP_j at year t or $GDP_{VNt} \cong GDP_{jt}$), then $Ln[1- (GDP_{VNt}/(GDP_{VNt} + GDP_{jt}))^2 - (GDP_{jt}/(GDP_{VNt} + GDP_{jt}))^2] \approx \ln[1 - (1/2)^2 - (1/2)^2] \approx \ln[1 - (1/4) - (1/4)] \approx \ln (1/2) = -0.69$. The index of similarity in GDP size should have positive impact on foreign trade, especially on exports. This is the most important variable in the gravity equations for it assesses the impact of the index of similarity in GDP size on exports and imports of Vietnam. In other words, it helps us find the answer for the research question presented in the preamble of the paper. All the variables, except the dummies, are in natural logarithm form in gravity equations.

3.2. The data set

For the data, the empirical analysis presented in this paper is based on a panel data of country pairs set in the period from 1995 to 2011 which involves 18 Vietnam's major/stable trading partners including: Australia, Belgium, Canada, China, France, Germany, Hong Kong, Japan, Malaysia, the Netherlands, the Philippines, the Russian Federation, Singapore, the Republic of Korea, Taiwan, Thailand, the United Kingdom (UK), and the United States. Eighteen trading partners listed above account for around 80% of Vietnam's foreign trade in duration of 1995 - 2011. The data were obtained from different reliable sources such as Vietnam's authorities (*e.g.*, the General Statistics Office (GSO), the Ministry of Industry and Trade (MIT), the Ministry of Planning and Investment (MPI)) and the international organizations (*e.g.*, the Asian Development Bank (ADB), the International Monetary Fund (IMF), the United Nations Statistics Division (UNSD), the World Bank (WB), and the WTO). In regards to the special case of Taipei (Taiwan), the figures were collected from ADB and the World Economic Outlooks October 2012, available on Knoema's website. The subsequent section will present the empirical results and some discussions.

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[7] AFTA: ASEAN Free Trade Area; USBTA: The U.S. – Vietnam Bilateral Trade Agreement; ACFTA: ASEAN China Free Trade Area; AKFTA: ASEAN Korea Free Trade Agreement; JVEPA: Japan Vietnam Economic Partnership Agreement; AJCEP: ASEAN - Japan Comprehensive Economic Partnership Agreement; AANZFTA: ASEAN - Australia - New Zealand Free Trade Agreement.

4. THE EMPIRICAL RESULTS AND DISCUSSIONS

The estimated results of $LnEX_{jt}$ and $LnIM_{jt}$ gravity equations are summarized and reported in the Table 4, Table 5, Table 6 and Table 7 below using the econometric software Stata 11 and the Hausman-Taylor estimator.

Table 4. Gravity Model Estimations using Hausman-Taylor estimator

Explanatory Variables	Dependent Variables			
	$LnEX_{jt}$		$LnIM_{jt}$	
Time Varying Exogenous (x'_{1it})	Coefficient	P. Value	Coefficient	P. Value
LnSIMSIZE	2.111613*	0.005	0.1549599	0.776
$LnRER_{CURj/VNDt}$	0.2185425**	0.018	0.1878377***	0.074
$Ln(ins_{VNt}*ins_{jt})$	-0.7171291**	0.017	-0.7976364*	0.001
FTA	0.2305745**	0.024	0.2396292*	0.001
$Bothin_{VNjt}$	-0.6370675***	0.094	1.182218*	0.000
$Onein_{VNjt}$	-0.3824997**	0.018	0.3431386*	0.003
CRI_j^{1997}	0.2910508*	0.001	0.1361741**	0.024
CRI_j^{2008}	0.2630407	0.330	-0.5987318*	0.002
Time Varying Endogenous (x'_{2it})				
$LnGDP_{VNt}$	0.3628319	0.587	1.481185*	0.002
$LnGDP_{jt}$	2.551989*	0.000	0.9565375***	0.056
$LnFDI_{jt-1}$	0.0562757**	0.016	0.0589474*	0.000
Time Invariant Exogenous (z'_{1i})				
$LnDIS_{VNj}$	-1.058839*	0.000	-1.641928*	0.000
BOR_{VNj}	-1.085608	0.190	-0.7403132	0.526
Constant	-41.1477*	0.000	-24.6597*	0.000

*Notes: *, **, and *** indicate significance at the levels of 1%, 5%, and 10% respectively.*

Table 5. Summary of the Statistics (Period: 1995 - 2011, Countries: 18, Observations: 306)

Variables	Observations	Mean	Standard Deviation	Min	Max
$LnEX_{jt}$	306	20.4561	1.1627	16.7017	23.5033
$LnIM_{jt}$	306	20.3741	1.4608	16.8974	23.8168
$LnDIS_{VNj}$	306	8.3099	0.9309	6.7140	9.5226
$LnGDP_{VNt}$	306	24.5363	0.3192	23.9940	25.0309
$LnGDP_{jt}$	306	27.2633	1.3520	24.9592	30.2141
LnSIMSIZE	306	-2.2742	1.1348	-5.1491	-0.7707
$LnFDI_{jt-1}$	306	17.9463	1.8680	10.6049	21.7693
$LnRER_{CURj/VNDt}$	306	7.8679	2.0986	2.2858	10.3280
$Ln(ins_{VNt}*ins_{jt})$	306	7.9462	0.3712	6.6646	8.3059
FTA	306	0.2549	0.4365	0	1
$Bothin_{VNjt}$	306	0.2778	0.4486	0	1
$Onein_{VNjt}$	306	0.6405	0.4806	0	1
CRI_j^{1997}	306	0.1438	0.3515	0	1
CRI_j^{2008}	306	0.2941	0.4564	0	1
BOR_{VNj}	306	0.0555	0.2294	0	1

eu
wq

Table 6. Correlation matrix for $LnEX_{jt}$ equation

Correlation	$LnEX_{jt}$	$LnDIS_{VNj}$	$LnGDP_{VNt}$	$LnGDP_{jt}$	$LnSIMSIZE$	$LnFDI_{jt-1}$	$LnRER_{CURj/VNDt}$	$Ln(ins_{VNt}*ins_{jt})$	FTA	$Bothin_{VNjt}$	$Onein_{VNjt}$	CRI_j^{1997}	CRI_j^{2008}	BOR_{VNj}
$LnEX_{jt}$	1.0000													
$LnDIS_{VNj}$	-0.0577	1.0000												
$LnGDP_{VNt}$	0.6841	-0.0000	1.0000											
$LnGDP_{jt}$	0.3771	0.7099	0.1281	1.0000										
$LnSIMSIZE$	-0.2415	-0.6802	0.1061	-0.9676	1.0000									
$LnFDI_{jt-1}$	0.2890	-0.3085	-0.0147	0.0776	-0.0904	1.0000								
$LnRER_{CURj/VNDt}$	-0.0606	0.5159	-0.0028	0.1978	-0.2000	-0.2979	1.0000							
$Ln(ins_{VNt}*ins_{jt})$	0.1264	0.2974	-0.0004	0.2023	-0.1977	0.1819	0.4807	1.0000						
FTA	0.4820	-0.3518	0.4158	-0.0615	0.1081	0.1226	-0.1500	-0.2201	1.0000					
$Bothin_{VNjt}$	0.5516	-0.0190	0.7449	0.1021	0.0699	0.0309	0.0130	0.1122	0.3404	1.0000				
$Onein_{VNjt}$	-0.3999	0.0393	-0.5588	-0.0718	-0.0709	0.0023	0.1009	0.1806	-0.2182	-0.8278	1.0000			
CRI_j^{1997}	-0.1012	-0.2386	-0.3767	-0.1481	0.0482	0.1147	-0.1689	-0.0177	-0.2183	-0.2541	0.1517	1.0000		
CRI_j^{2008}	0.5395	0.0000	0.7753	0.1075	0.0754	0.0198	-0.0122	0.0192	0.3137	0.9608	-0.7869	-0.2645	1.0000	
BOR_{VNj}	0.1973	-0.1434	-0.0000	0.1884	-0.1829	-0.0159	-0.0356	-0.3531	0.1855	0.0088	-0.1454	0.0632	0.0000	1.0000

Table 7. Correlation matrix for LnIM$_{jt}$ equation

Correlation	LnIM$_{jt}$	LnDIS$_{VNj}$	LnGDP$_{VNt}$	LnGDP$_{jt}$	LnSIMSIZE	LnFDI$_{jt-1}$	LnRER$_{CURj/VNDt}$	Ln(ins$_{VNt}$*ins$_{jt}$)	FTA	Bothin$_{VNjt}$	Onein$_{VNjt}$	CRI$_j^{1997}$	CRI$_j^{2008}$	BOR$_{VNj}$
LnIM$_{jt}$	1.0000													
LnDIS$_{VNj}$	-0.4628	1.0000												
LnGDP$_{VNt}$	0.5278	-0.0000	1.0000											
LnGDP$_{jt}$	0.0945	0.7099	0.1281	1.0000										
LnSIMSIZE	0.0170	-0.6802	0.1061	-0.9676	1.0000									
LnFDI$_{jt-1}$	0.5487	-0.3085	-0.0147	0.0776	-0.0904	1.0000								
LnRER$_{CURj/VNDt}$	-0.4252	0.5159	-0.0028	0.1978	-0.2000	-0.2979	1.0000							
Ln(ins$_{VNt}$*ins$_{jt}$)	-0.0548	0.2974	-0.0004	0.2023	-0.1977	0.1819	0.4807	1.0000						
FTA	0.4686	-0.3518	0.4158	-0.0615	0.1081	0.1226	-0.1500	-0.2201	1.0000					
Bothin$_{VNjt}$	0.4385	-0.0190	0.7449	0.1021	0.0699	0.0309	0.0130	0.1122	0.3404	1.0000				
Onein$_{VNjt}$	-0.3876	0.0393	-0.5588	-0.0718	-0.0709	0.0023	0.1009	0.1806	-0.2182	-0.8278	1.0000			
CRI$_j^{1997}$	-0.0313	-0.2386	-0.3767	-0.1481	0.0482	0.1147	-0.1689	-0.0177	-0.2183	-0.2541	0.1517	1.0000		
CRI$_j^{2008}$	0.4362	0.0000	0.7753	0.1075	0.0754	0.0198	-0.0122	0.0192	0.3137	0.9608	-0.7869	-0.2645	1.0000	
BOR$_{VNj}$	0.2415	-0.1434	-0.0000	0.1884	-0.1829	-0.0159	-0.0356	-0.3531	0.1855	0.0088	-0.1454	0.0632	0.0000	1.0000

The Gravity Models constructed in this paper seem fit the data well because no of correlations exceeds 0.8 (see more on the Table 6 and Table 7). The estimates presented in the Table 4 indicate that a large share of the variation of Vietnam's exports and imports recently could be explained by a considerable number of factors, namely, GDP, Distance, FDI, FTA, Exchange rate, Institution, WTO, Crises, and the Index of similarity in GDP size (SIMSIZE in short). However within the analysis framework of this study, the author focuses more on the coefficients β_{14} and β_{24} for they reflect the impact of similarity in GDP size on exports and imports of Vietnam. Furthermore, they support for the answer of the research question: Does the increasing similarity in GDPs among developing countries lead to higher bilateral trade between them?

First, the coefficient of the lnSIMSIZE variable (β_{14}) in the $LnEX_{jt}$ equation is positive and statistically significant at the level of 1% suggesting that Vietnam has exported much more of goods to the country partners which have the similarity in GDP size with her. By contrast, the coefficient of the lnSIMSIZE variable (β_{24}) in the $LnIM_{jt}$ equation is not statistically significant indicating that Vietnam has not imported as such of goods from those similar trading partners. The question is why does Vietnam tend to export more to trading partners with similarity in GDP size? The answer could be related to the FDI in Vietnam. It is shown that the presence of foreign firms in Vietnam, through horizontal and vertical (backward or forward) linkages, significantly affects the exports of Vietnam, especially, in intra-industry trade. [8] Mentioning the FDI in Vietnam, since the launch of the "outward - looking policy" from the early 1990s, the country has successfully attracted a considerable amount of FDI capitals from regional countries, especially after her accession

to the WTO. [9] The accumulative figure is over $ 220,000 million, in which implemented FDI capital is around $ 100,000 million in 1986 - 2011 duration. It is clear that FDI in Vietnam is seeking for export-orientation resulting from trade liberalization under FTAs and the WTO in which Vietnam has joined recently. Notably, FDI focuses on processing and assembling industries to enjoy/exploit the cheap domestic labors and natural resources. However, as analyzed in the previous sections, due to lack of subsidiary industries, most all of FDI enterprises have to seek the input material sources from the world markets (usually from mother companies). After manufacturing or processing, foreign firms export their outputs (finished/final products) back to home country or to the global market. The share of FDI enterprises in Vietnam's total exports is around 55% in recent years. This might be one cause for the increase of the intra-industry trade in Vietnam. The expertise partially comes from the empirical results. The estimated coefficient of the $lnFDI_{jt-1}$ variable is positive and significant at the levels of 5% and 1% respectively in the $LnEX_{jt}$ and $LnIM_{jt}$ gravity equations. This suggests that FDI has stimulated both the country's exports and imports recently. Obviously, FDI has been an important factor inducing the country's foreign trade. In Addition, Markusen and Venables (1998) found the importance of *multinational firms* in total activity when countries are similar in incomes (size) and in relative factor endowments, and when total world income is high. [10] Moreover, as shown in the work of Kyoji (2003) that as economic integration in East Asia progresses, trade patterns within the region are displaying an ever-greater complexity: the share of inter-industry trade in overall trade is declining. Instead, intra-industry trade (IIT), which can be further divided into horizontal IIT and

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[8] For further information, please see more on Anwar and Nguyen (2011).

[9] See more on Hoang (2013).

[10] Markusen, J.R. and Venables, A.J. (1998). Multinational firms and the new trade theory. Journal of International Economics 46, pp. 183-203.

vertical IIT, is growing in importance. [11] Particularly, vertical IIT is closely related to offshore production by multinational enterprises. This implies that FDI plays a significant role in the rapid increase in vertical IIT in East Asia in recent years. Roldán et al. (2011) have proved for the growth of IIT in overall trade between Latin America and Asia. Accordingly, the economic sectors in this analysis include the agro-based, rubber-based, wood-based products, fisheries, health-care, automobile, textile and garments, electronics, and ICT industries. Their findings indicate that the Grubel-Lloyd index (GLI) allows the identification of sectors where there is evidence of IIT among ASEAN-7 [12] (including Vietnam) and the Pacific Alliance. [13] Thus the trade relation between those countries has the potentiality to become IIT. These results are relevant in the light of the identification of opportunities to expand trade and straighten the production linkages among APEC members in the intra-industry trade.

Second, for the $lnGDP_{jt}$ and $lnGDP_{VNt}$ variables, theoretically when GDP of a country partner grows (in this situation income of its domestic consumers also increases) resulting in an increase in the demand of foreign imported goods. Consequently, a country partner is likely to import more from abroad. It means an increase of a country partner's GDP will potentially motivate Vietnam's exports. The estimated coefficients of the $lnGDP_{jt}$ variables in both the $LnEX_{jt}$ and $LnIM_{jt}$ equations are positive and significant at the levels of 1% and 10% respectively. This means an increase of GDP of country partner strongly motivates both exports and imports of Vietnam. The author also observes the positive significant coefficient of the $lnGDP_{VNt}$ variable in the $LnIM_{jt}$ equation. This suggests that the development of Vietnam's domestic market (economic growth), in turn, led to an increase in the country's imports to serve this process. In other words, local suppliers could not satisfy all demands for domestic manufacturing and consuming, hence the country had to seek the imports from foreign sources.

Third, while the author finds the positive impacts of the exchange rate regime on both Vietnam's exports and imports the negative significant coefficients of institutional variables in both gravity equations suggesting that institution has been a friction in foreign trade of the country. So the policy makers of Vietnam should take a look on this issue. As the author predicted, the FTAs which Vietnam has signed/joined recently have induced both exports and imports of the country as they present the culmination of trade integration within the economic space of country members. The coefficients of these dummy variables are significant in two gravity equations.

Fourth, the estimated results show that the WTO has clearly expanded the country's imports rather than exports. This expresses the "trade creation effect" (replace the higher cost of domestic production by lower cost sources of supply from abroad through importation) as the WTO accession is accompanied by Vietnam's

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[11] The **Intra-industry trade** (IIT) is also defined as one that occurs "if a country simultaneously imports and exports similar goods and services" (Van Marrewijk, 2009). **Horizontal intra-industry trade** refers to the simultaneous import and export of goods classified in the same industry and at the same level of processing (Van Marrewijk, 2009). **Vertical intra-industry trade** is characterized by a two-way exchange of goods classified in the same industry but with different levels of processing (Van Marrewijk, 2009). The extent of intra-industry trade is commonly measured by **Grubel-Lloyd index** based on commodity group transactions. Thus, for any particular product class i, an index of the extent of intra-industry trade in the product class i between countries A and B is given by the following ratio:

$$IIT_{i,AB} = [((X_i + M_i) - |X_i - M_i|)/(X_i + M_i)]*100$$

This index takes the minimum value of zero when there are no products in the same class that are both imported and exported, and the maximum value of 100 when all trade is intra-industry (in this case X_i is equal to M_i).

[12] ASEAN-7 Includes ASEAN members also in APEC: Brunei Darussalam, Indonesia, Malaysia, the Philippines, Singapore, Thailand and Vietnam.

[13] The Pacific Alliance or *Alianza del Pacífico* in Spanish was initially known as *Acuerdo de Integración Profunda* AIP. Currently, the Pacific Alliance members are: Mexico, Colombia, Chile and Peru.

tariff reduction and loosening the quantitative restriction. The question is why does the WTO have not induced the country's exports as had it in mind? The explanation comes partially from Subramanian and Wei (2007, p. 157) arguments that when Vietnam liberalizes its imports under the WTO's agreements, there is reason to expect Vietnam's imports from the WTO members to increase but there is no theoretical reason for its exports to the WTO members to increase as well. In other words, the trade effect of the WTO really relates to imports rather than exports, and Vietnam is not an exceptional case.

Fifth, the author confers the impacts of two financial crises on Vietnam's exports and imports. The empirical results indicate that the 1997 crisis did not reduce the volume of the country's foreign trade as predicted for its positive significant coefficients in both gravity equations. By contrast, the 2008 global financial and economic crisis has had negative impact on imports of the country. The coefficient of this variable is negative and significant at the level of 1% in the $LnIM_{jt}$ equation. This implies that the channel that transmits the forces that raise growth also transmits forces that lower growth when world markets weaken and decline. The fact is that the more open an economy is to trade, the faster it can grow when world demand is expanding. But when there is a crumple/collapse in world demand; the more open an economy is, the more exposed it is to negative external shocks. This suggests that Vietnam should vary her export-import structure and export destinations as well as import sources to avoid depending much more on some trading partners.

Finally, the coefficients of the $LnDIS_{VNj}$ variables in both gravity equations are clearly negative and significant at the level of 1% indicating that Vietnam trades less from more distant countries owing to higher transport and transaction costs. Transport and transaction costs are likely to increase if two countries are located far away from each other. This is definitely appropriate with the results in many empirical studies using the theory of gravity. To this end, contrary to popular belief, the close geographical location between Vietnam and China has not induced Vietnam's trade flows with this neighbor country because the coefficients of the BOR_{VNj} dummy variables are insignificant in both gravity equations.

5. CONCLUDING REMARKS

By constructing two gravity models and a panel data of country pairs that involves 18 major trading partners during 1995 - 2011 and the Hausman-Taylor estimator, the paper finds evidence broadly consistent with the hypothesis/prediction that the SIMSIZE has promoted strongly Vietnam's exports of goods to similar trading partners. By contrast, there is no evidence that demonstrates convincingly that Vietnam has imported such large amount of goods from those countries. These investigations are also sufficient for the conclusion that the increasing similarity in GDPs among developing countries could lead to higher bilateral trade between them. The main findings of this research provide some support for the New Trade Theory. Hence, international trade is not only driven by differences in factor endowments as stated in neoclassic theories such as the Ricardian theory of Comparative Advantage and the H-O theory but also by the identical factor endowments inspired by the New Trade Theory. This implies that the inter-industry trade (motivated by traditional neoclassic theories) *seems to be prevalent* between counties which have differences in factor endowments; and intra-industry trade (supported by the New Trade Theory) *is likely to be prevailed* between countries with identical factor endowments.

Overall, there is no doubt that my investigations can somewhat contribute to the existing literature on the New Trade Theory in terms of testable implications from gravity models that emphasize in the case study between some developing countries. However, available data have been too limited to selected trading partners of Vietnam to produce a persuasive test of the hypothesis. It could well

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be that some more samples of developing countries were included in the panel data. And, an analysis of the IIT at the firm/industry level for the case of Vietnam is also very important to support for these investigations, which merits future research to understand how international trade is transformed.

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