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# THE IMPACT OF NATIONAL CULTURE ON BILATERAL TRADE IN VIETNAM

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## ABSTRACT

The purpose of this paper is to examine whether or to what extent national culture influences bilateral trade flows between Vietnam and its trading partners. Using a panel dataset of 52 countries from 2001 till 2011 and six cultural dimensions of Hofstede, the regression analysis performed by gravity model shows that national culture and bilateral trade flows between Vietnam and trading partners are significantly correlated. This study's implications may help macro-policy makers devise better export promotion policies and boost the volume of bilateral trade between Vietnam and other countries around the world.

Keywords: *National culture, bilateral trade, gravity model, Vietnam*.

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## 1. INTRODUCTION

Throughout the late 20th century and into the 21st century, globalization emerged as a phenomenon with important implications in today's world marketplace. Globalization is studied from various aspects such as culture, economics, politics, society… (Manrai & Manrai, 2011). The cultural theories are put into social sciences studies such as international business, international management and more from the last decades of the 20th century. In recent years, analyzing the influence of national culture in international trade of a country is also increasing, and national culture is considered a factor is playing an essential role in international trade. Each society has its elements of culture. These elements of culture are manifested through: language, religion, education, social institutions (Czinkota, 2007). According to Ball *et al.* (1998), trade with other cultures is not easy, and it is difficult to succeed by facing many changes in culture and business environment. Without a cultural familiarity will be the major barrier to participate in international trade (Lane et al., 2001). International trade leads to interaction and communication between different cultures. Therefore, to be successful in the global market, countries need to equip a basic knowledge about culture's various attributes (Adler, 1983). Hofstede (2001) defines culture as the collective programming of the mind that distinguishes one group or category of people from another, influences how an individual behaves, communicates with others, or interprets information that may be influenced by his or her culture (Carlson, 1974) and calibrates thoughts and behaviors such that they are compatible with overall value (Litch *et al*., 2005). Many studies have extended the basic trade-flow gravity equation with dummy variables indicating whether the trading partners share a common language, religion and colonial past (Srivastava & Green, 1986; Anderson & Marcouiller, 2002; Frankel & Rose, 2002; Yeyati, 2003; De Groot et al., 2004; Frankel et al., 1997; Boisso & Ferrantino, 1997; Guiso et al., 2004) and found out significantly positive effects on the magnitude of international trade flows. These variables capture cultural familiarity in the sense that the trading partners will have more knowledge of each other's culture and will find it easier to communicate and share information (Rauch, 1999; 2001). Therefore, cultural familiarity is an essential factor to help a country to succeed in the global market.

Although there were a great number of researches on the field of bilateral trade and factors impacting on it using gravity model to point out that gross domestic product (GDP), geographical distance, cultural distance, economic distance have essential effects on trade flows between countries. However, in Vietnam, the number of researches on this subject is still quite modest, particularly analyzing the impact of national culture on bilateral trade is even more scarce.

This paper aims to analyze the impact of national culture on bilateral trade between Vietnam and trading partner countries worldwide by applying the gravity model. The rest of this paper is organized as follows. Section 2 reviews related literature and develops a hypothesis. A research method is described in Section 3, while empirical results are discussed in Section 4. Finally, Section 5 provides a conclusion, practical implications and offers future research opportunities.

## 2. THEORETICAL BACKGROUND AND HYPOTHESES

### 2.1 Gravity model

Gravitation theory is one of the basic international trade theories utilized intensively to explain bilateral trade flows between two or more countries. The gravity model was first applied to examine international trade flows by Timbergen (1962). The final estimated results showed that countries with larger economic sizes and closer distance tend to trade with each other more. This also means that the greater distance will more riskily penetrate the domestic market of partners. In

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contrast, the trade will more potential (Ghemawat, 2001). The distance here refers to the geographical distance and includes cultural distance, economic distance, and institutional distance. By augmenting the gravity model, many researchers identified that exchange rate (Bergstrand, 1985; Dell'Arricia, 1999), technological innovation (Fagerberg et al., 1997; Wakelin, 1998), openness (Rahman, 2009), trade between members of the trade blocs (Carrere, 2006) give a significant impact on bilateral trade value. The gravity model was converted to Cobb - Douglas as follows:

$$T_{ij} = AY_i^{\beta_1} Y_j^{\beta_2} DIS_{ij}^{\beta_3}$$

Where:

*$T_{ij}$: is the total trade flow from origin country i to destination country j;*

*$Y_i$: is the economic size (GDP) of country i;*

*$Y_j$: is the economic size (GDP) of country j;*

*$DIS_{ij}$: is the distance between two countries i and j;*

*$\beta_1, \beta_2, \beta_3$: are coefficients that show the level of impacts of each factor in the model;*

*A: is a constant term.*

## 2.2 Hypotheses

**Power distance.** Power distance reflects the extent to which less powerful members of organizations accept an unequal distribution of power and an unequal distribution of power as the proper way of organizing social systems (Adler & Gundersen, 2008). Chui and Kwok (2008) find that institutions' role will be more prominent in high power distance countries, and those countries are said to be more collectivistic. Markets with higher institutional systems should have better-developed information flow and are consequently more efficient (Chui et al., 2008). Besides, Ghemawat & Richie (2011) also showed that countries with high power distance would focus on building and maintaining social relationships. Good social relationships and good information systems would contribute to building mutual trust in trade between countries and reducing risks and costs. Therefore, we propose the following hypothesis:

*Hypothesis 1: There is a positive relationship between power distance and bilateral trade.*

**Individualism.** Individualism reflects the degree to which a society emphasizes the individual's role as opposed to that of the group. High individualism proves that individuals loosely connected with people and vice versa. Chui et al. (2008) state that people will discuss and work together to expand social relationships in a collectivist society. Hofstede (1984) also found that individuals and families will constantly develop personal connections in such a community, which leads to an expansion outside of the nation. Such a social network can be used to reduce information and trust constraints in international business transactions. Hofstede (1984) points out that "private life is invaded by organizations and clans to which one belongs in collectivist societies." The use of personal relationships to transfer information on international trade is a powerful one. International trade is constrained by the lack of trust in business relations. This lack of trust results in need to use costly contracts. With mutual trust in trade relations, these costs can be minimized and contribute to promoting bilateral trade between countries. Park and Lemaire (2011) find countries with a high individual score to search for more security in insurance and increase trade barriers to minimize potential risks, indicating a link between uncertainty avoidance and individualism.

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*Hypothesis 2: There is a negative relationship between individualism and bilateral trade.*

**Masculinity.** Masculinity refers to a society that emphasizes traditional masculine values such as competitiveness, assertiveness, achievement, ambition, and the acquisition of money and other material possessions on trade. Femininity refers to nurturing, helping others, putting relationships with people before money, not showing off, minding the quality of life and cautiousness (Hofstede, 2001). Masculine countries emphasize factors such as being very assertive and having a willingness to seek new trading partners (De Jong & Semenov, 2002). People in masculine countries are likely to show overconfidence when participating in international trade and quite easy to establish relationships while conservatively behave in countries with low masculinity (Lucey & Zhang, 2010). Barber & Odean (2001) clearly show that overconfidence and self-attribution are more pronounced in men than in women. In feminine societies, people often want to minimize the risks, so trade barriers in these countries are relatively stricter. Chui & Kwok (2008) find feminine societies to purchase more insurance, as they care more about family needs, showing a link with uncertainty avoidance. Therefore, trading with feminine countries are often more complex and take more time to establish the relationship.

*Hypothesis 3: There is a positive relationship between masculinity and bilateral trade.*

**Uncertainty avoidance.** Uncertainty avoidance describes how nations deal with uncertainty. Uncertainty, a fact of human existence, is dealt with differently across countries through technology, law and region. Uncertainty avoidance is directly related to the level of anxiety in society and how it is handled (Hofstede, 1984). Lucey & Zhang (2010) find that countries with high uncertainty avoidance often worry about building relations with the outside, especially with new markets where they do not understand. Hofstede (1984) suggested one national characteristic concerning bilateral trade of countries with low uncertainty avoidance – Tolerance. Firstly, Hofstede (1984) said that the countries with low uncertainty avoidance have a higher tolerance for foreigners' ambiguity. Accepting and adapting to foreigners is a critical characteristic for a nation competing in the global marketplace. Secondly, countries with low uncertainty avoidance will limit substantial trade barriers when participating in international trade. These barriers need not relate directly to trade. Still, they can take the form of safety standards, quality controls, environmental regulations or general "red tap," each of which are commonly associated with non-tariff barriers and also impede more or less bilateral trade.

*Hypothesis 4: There is a negative relationship between uncertainty avoidance and bilateral trade.*

**Long Term Orientation.** Hofstede (2001) finds the long term orientation societies to find the values orientated to the future important, saving, perseverance, persistence, adapting to changing circumstances and expanding social relationships. Short-term orientated societies relate to the past and present, such as traditions, preservation of "face," fulfilling social obligations and difficulty to adapt to other cultures. Yeh & Lawrence (1995) argued that this dimension is strongly related to individualism. Societies in which people have a long-term orientation tend to be collectivistic, whereas those who are less long term oriented are more individualistic.

*Hypothesis 5: There is a positive relationship between long term orientation and bilateral trade.*

**Indulgence.** Indulgence stands for a society that allows relatively free gratification of basic and natural human drives related to enjoying life and having fun. Restraint stands for a society that suppresses gratification of needs and regulates it through strict social norms (Hofstede, 2011). Countries with higher indulgence will not be too conservative and control society by strict rules and norms, easy to expand relationships, and integration. Besides, in a society with higher enjoyment levels, the demand for goods and services also becomes richer and more diversified.

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Therefore, promoting trade in goods beyond one national border and foreign goods easily penetrate.

*Hypothesis 6: There is a positive relationship between indulgence and bilateral trade.*

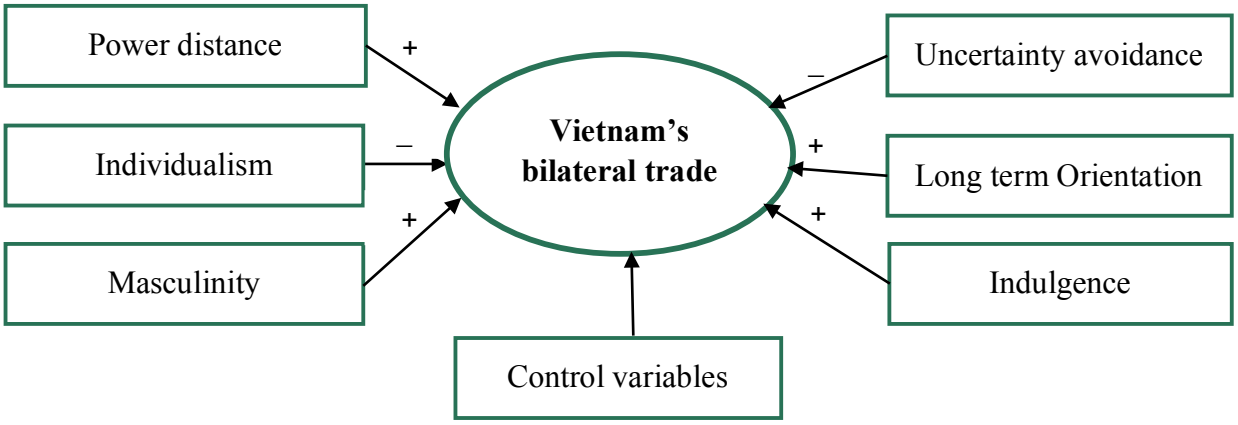


Figure 1. Theoretical model

## 3. RESEARCH METHODOLOGY

### 3.1 Data

Our dataset consists of a balanced panel data from the period 2001 – 2011 (11 years) for 52 observed countries divided 5 main groups: Group I: top 3 most developed economies in the world: The United States, Japan, China; Group II: 22 countries in European Union (EU); Group III: 5 countries in Southeast Asia; Group IV: 12 countries in Southwest Asia - Group V: 10 countries in Africa. We cannot go beyond this period because data on these countries after 2011 were not available when these were collected. All observations are annual.

Annual data on bilateral trade (sum of exports and imports) between Vietnam and 52 partner countries is obtained from International Trade Centre (ITC) and Organization for Economic Co-operation and Development (OECD), the period from 2001 to 2011. Data on six cultural dimensions of 52 partner countries is obtained from Hofstede's website[1]. Annual data on GDP, GDP per capita (Purchasing Power Parity – PPP), the exchange rate of Vietnam and 52 partner countries are obtained from International Monetary Fund (IMF), World Bank (WB), the period from 2001 to 2011. Annual data on nominal GDP, population, number of scientific journals of Vietnam and partner countries are obtained from IMF and WB, the period from 2001 to 2011. Data on the distance (in kilometres) between Ha Noi (capital of Vietnam) and other capital cities of partner countries (as the crow flies) is taken from Great Circle Distance between Capital Cities[2]. Data on FTAs is obtained fromWorld Trade Organization (WTO). Data on the common border between Vietnam and partner countries are taken from Chinh Phu's website.

[1]http:// www.geert-hofstede.com/vietnam.html
[2]http:// www.chemical-ecology.net

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### 3.2 Measurement

Three models can be estimated in panel data estimation. These models are Pooled OLS, fixed-effects model (FEM) and random effects model (REM). If individual effects do not exist, the pooled model will be the best choice. If they exist and must be reflected in the model, the FEM and REM will be preferred. However, in panel data with many entities (larger) and few periods (small t) often exist heteroscedasticity. Meanwhile, the FEM and REM will be ineffective. Therefore, this study will make some diagnostic tests to select the best model.

First of all, we examine the multicollinearity phenomenon by the "VIF" command after Pooled OLS regression. The results show that the VIF of all the variables is below the threshold value of 10.0. However, the pair of variables $BORDER_{ij}$ and $FTA_{jt}$ with correlation coefficient is 0.92 (Table 2). This coefficient is quite high, and there is the possibility of multicollinearity phenomenon in the model. To repair this phenomenon, we will remove the independent variables with a high correlation coefficient and use the appropriate regression methods. Section4 will present in detail how to remove these variables. After that, the F test is used to check whether FEM is better than Pooled OLS with the null hypothesis that country-specific effects are jointly zero. The F test result rejects the null hypothesis ($p<0.05$), and FEM is better than Pooled OLS. Breusch and Pagan Lagrangian multiplier test (xttest0) is performed to select the estimated results between Pooled OLS and REM. The result reveals that the p-value is less than 0.05, which means the null hypothesis of equality of the individual effects is rejected, indicating that REM is a better estimator than Pooled OLS. Next, the Hausman test is applied to compare the REM and FEM estimators. Once again, we reject the null hypothesis since the p-value is smaller than 0.05, indicating that FEM is better than REM. However, the main problem with a FEM is that variables that do not change over time cannot be estimated directly because the inherent transformation wipes out such variables. So variables like geographical distance, culture distance, and the common border will not be supported in FEM, but these are the main gravity model variables. To solve this problem, Cheng and Wall (2005) estimated an additional regression with the individual effects as the dependent variable and time-invariant variables as explanatory variables. However, this method can affect the accuracy of the regression and the Hausman test for FEM and REM (Binh *et al*., 2011). Therefore, we will examine the defects in all 3 methods and choose the best method to estimate.

We use the "xtserial" command in Stata to perform the Wooldridge test for serial correlation in the model, and the result indicates that there is no serial correlation ($F(1.51) = 2.804$; $Prob>F = 0.10$). Next, we conduct testing heteroscedasticity in 3 methods. Firstly, using the "hettest" command to perform Breusch-Pagan/Cook-Weisberg test after Pooled OLS regression. Secondly, using the "xttest3" command to perform Modified Wald in FEM. Finally, using "xttest0" to perform Breusch and Pagan Lagrangian multiplier in REM. All tests give $p<0.05$, so Pooled OLS, FEM and REM exist heteroscedasticity, and estiamated results of three methods are inefficient. Therefore, the feasible generalized least squares method (FGLS) is used to estimate in this model. This is a Pooled OLS of a transformed 'isomorphic' model (the generalized linear model). It provides the BLUE under heteroskedasticity/ serial correlation. More importantly, the FGLS method is used in this study because it can control heteroskedasticity.

### 3.3 Model

In Viet Nam's case, the model applied in this study is a variation of the gravity model given by Bergstrand (1985). The gravity model is estimated in logarithm form as follows:

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$$\log TRADE_{ijt} = \beta_0 + \boldsymbol{\beta_1 PDI_j} + \boldsymbol{\beta_2 IND_j} + \boldsymbol{\beta_3 MAS_j} + \boldsymbol{\beta_4 UAI_j} + \boldsymbol{\beta_5 LTO_j} + \boldsymbol{\beta_6 IVR_j} + \beta_7 \log(GDP_{it}) + \beta_8 \log(GDP_{jt}) + \beta_9 \log(POP_{it}) + \beta_{10} \log(POP_{jt}) + \beta_{11} \log(DIS_{ij}) + \beta_{12} \log(EDIS_{ijt}) + \beta_{13} \log(TI_{it}) + \beta_{14} \log(TI_{jt}) + \beta_{15} ER_{ijt} + \beta_{16} OPEN_{jt} + \beta_{17} FTA_{jt} + \beta_{18} BORDER_{ij} + u_{ijt} \quad (2)$$

Where:

- *i = 1 (Vietnam);*
- *j = 2, 3,… (partner countries);*
- *t = 2001, 2002,…, 2011;*
- *$\beta_0$: is trade-attractive/restrictive coefficient of trade flow between Vietnam and country j;*
- *$\beta_1 \rightarrow \beta_{13}$:are coefficients of the factors. Their values show the level of impact of these factors on bilateral trade in the model;*
- *$\mu_{ijt}$: is disturbance term.*
-

*<u>*Dependent variable:*</u> ($TRADE_{ijt}$) is the annual trade value (sum of exports and imports) of Vietnam and partner country.

*<u>*Independent variables*</u>:*

*<u>*Control variables:*</u>

Vietnam and partner countries' GDP ($GDP_{it}$& $GDP_{jt}$): represent the purchasing power of importing and exporting country, productive capacity and needs of each country (Dilanchiev, 2012). These variables are measured by the total value of final goods and services produced in a country in year t.

Geographical distance ($DIS_{ij}$) is calculated from Ha Noi (capital of Vietnam) and other capital cities of partner countries (as the crow flies), which is measured in kilometer terms.

Economic distance ($EDIS_{ijt}$) is measured by the difference between GDP per capita of Vietnam and country j in year t. The increase in economic distance is expected to have a positive impact on bilateral trade flows.

Vietnam and partner countries' technological innovation ($TI_{it}$ & $TI_{jt}$)can be understood as the capability to put new ideas into practice by developing new products and processes. These variables are measured by the number of scientific journals of Vietnam and partner countries in year t.

Openness ($OPEN_{jt}$) is used as a factor representing the foreign trade policy of a country. Foreign trade policies tend more towards liberalization, the openness of the economy will increase, which leads to more significant trade between countries. This variable is measured by the ratio of the sum of exports and imports to the total product value of partner countries j in year t.

Free trade agreements ($FTA_{jt}$) is a dummy variable, receives value 1 if country j and Vietnam have free trade agreement before or in year t, receive value 0 in vice versa. They are forms of trade pacts between countries, set to eliminate tariffs, quotas and other trading barriers between those countries (Kepaptsoglou et al., 2010).

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Vietnam and partner countries' population ($POP_{it}$ & $POP_{jt}$). The population is a special factor. On the one hand, the population is the important factor of production (labor force), which has a great influence on the amount of goods produced. On the other hand, the population is the source of goods consumption. The population is used to estimate each country's market size, which is a factor affecting international trade. A country with a large population means a large domestic market (Eita, 2008).

Exchanges rate ($ER_{ijt}$) is the price of a country's currency in terms of another currency.

Common border ($BORDER_{ij}$) is a dummy variable, receives value 1 if country j and Vietnam share a common border in land or sea, and receives value 0 in vice versa. Countries with common borders are likely to have more trade than countries without common borders (McCallum, 1995).

## 4. EMPIRICAL RESULTS

Table 1 shows observation, mean, standard deviation, min and max values of variables before taking the logarithm. Table 2 shows the descriptive statistics and correlation coefficients after taking the logarithm. Table 2 indicates that the correlations between the independent variables are below 0.8, except for the correlation between $BORDER_{ij}$ và $FTA_{jt}$ is 0.92. The correlation coefficient is quite high and can cause the multicollinearity phenomenon. Besides, based on the estimated results by 3 methods: Pooled OLS, REM and FEM, the impact of $FTA_{jt}$ seems not clear. Therefore, we decided to remove this variable from the model. In this study, R-squared statistic computed from GLS, so sums of squares need not be bounded between zero and one and do not represent the percentage of the total variation in the dependent variable accounted for by the model. Also, eliminating or adding variables in a model does not always increase or decrease the computed R-squared value. Therefore, this study considers the model's relevance based on the log-likelihood (LL) value. The smaller LL will more highly make the relevance of the model. Table 3 presents estimated results using FGLS regression. All regression models are statistically significant ($P < 0.01$), and LL is relatively small (model 7's LL is -666.09). This shows that the model is well explained by including all independent variables and control variables simultaneously.

**Table 1. Descriptive statistics**

| Variables | Obs | Mean | Standard deviation | Min | Max |
|---|---|---|---|---|---|
| **Dependent variable** | | | | | |
| Bilateral trade value ($TRADE_{ijt}$) (in USD thousands) | 572 | 1.294.,538 | 3,522,625 | 975 | 36,479,716 |
| **Independent variables** | | | | | |
| Power distance ($PDI_j$) | 572 | 63.40 | 21.09 | 13 | 100 |
| Individualism ($IDN_j$) | 572 | 44.78 | 22.14 | 14 | 91 |
| Masculinity($MAS_j$) | 572 | 49.25 | 19.46 | 5 | 100 |

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| | | | | | |
|---|---|---|---|---|---|
| Uncertainty avoidance($UAI_j$) | 572 | 64.11 | 21.18 | 5 | 100 |
| Long term Orientation ($LTO_j$) | 572 | 41.58 | 24.80 | 0 | 88 |
| Indulgence($IVR_j$) | 572 | 40.36 | 23.92 | 0 | 84 |
| **Control variables** | | | | | |
| Vietnam's GDP ($GDP_{it}$)(in billion USD) | 572 | 251.20 | 124.61 | 3.00 | 414.34 |
| Partners's GDP ($GDP_{jt}$)(in billion USD) | 572 | 956.71 | 2,221.80 | 8.06 | 15,517.92 |
| Geographical distance ($DIS_{ij}$) (km) | 572 | 7,418.14 | 2,817.25 | 989.11 | 13,346.30 |
| Economic distance ($EDIS_{ijt}$) | 572 | 20,878.03 | 18,416.07 | 183.27 | 90,055.79 |
| Vietnam's technological innovation($TI_{it}$) | 572 | 576.48 | 345.22 | 205.90 | 1.217.90 |
| Partners's technological innovation ($TI_{jt}$) | 572 | 126,575.30 | 692,292.60 | 20.90 | 9,597.373 |
| Openness ($OPEN_{jt}$) | 572 | 1.34 | 0.48 | 0.05 | 3.50 |
| Free trade agreements ($FTA_{jt}$) | 572 | 0.13 | 0.34 | 0 | 1 |
| Vietnam's population ($POP_{it}$) (people) | 572 | 81,984,507 | 10,700,000 | 61,882.95 | 87,860,300 |
| Partners' population ($POP_{jt}$) (people) | 572 | 55,621,202 | 18,500,000 | 2,980.96 | 1,344,130,000 |
| Exchange rate ($ER_{ijt}$) | 572 | 10,428.69 | 12,728.69 | 1.44 | 74,316.36 |
| Common border ($BORDER_{ij}$) | 572 | 0.12 | 0.32 | 0 | 1 |

*Source: Our survey (2021)*

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**Table 2. Bivariate correlation and descriptive statistics (N=572)**

| | VIF | Mean | S.D | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) | (17) | (18) | (19) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.log$TRADE_{ijt}$ | | 12.07 | 2.11 | 1.00 | | | | | | | | | | | | | | | | | | |
| 2. $PDI_j$ | 3.20 | 63.40 | 21.09 | -0.13 | 1.00 | | | | | | | | | | | | | | | | | |
| 3. $IND_j$ | 4.32 | 44.78 | 22.14 | 0.18 | -0.74 | 1.00 | | | | | | | | | | | | | | | | |
| 4. $MAS_j$ | 1.69 | 49.25 | 19.46 | 0.16 | 0.23 | 0.08 | 1.00 | | | | | | | | | | | | | | | |
| 5. $UAI_j$ | 1.72 | 64.11 | 21.18 | -0.22 | 0.09 | -0.01 | 0.10 | 1.00 | | | | | | | | | | | | | | |
| 6. $LTO_j$ | 1.91 | 41.58 | 24.80 | 0.37 | -0.29 | 0.41 | 0.14 | 0.02 | 1.00 | | | | | | | | | | | | | |
| 7. $IVR_j$ | 1.55 | 40.36 | 23.92 | 0.23 | -0.20 | 0.25 | -0.19 | -0.27 | 0.05 | 1.00 | | | | | | | | | | | | |
| 8.log$GDP_{it}$ | 3.11 | 5.10 | 1.34 | 0.65 | -0.12 | 0.08 | 0.05 | -0.02 | 0.11 | 0.11 | 1.00 | | | | | | | | | | | |
| 9.log$GDP_{jt}$ | 6.07 | 5.61 | 1.57 | 0.74 | -0.10 | 0.24 | 0.32 | -0.03 | 0.25 | 0.11 | 0.46 | 1.00 | | | | | | | | | | |
| 10.log$DIS_{ij}$ | 3.97 | 8.79 | 0.56 | -0.36 | -0.31 | 0.39 | -0.05 | 0.24 | -0.18 | 0.19 | -0.08 | -0.21 | 1.00 | | | | | | | | | |
| 11.log$EDIS_{ijt}$ | 2.67 | 9.34 | 1.36 | 0.35 | -0.41 | 0.50 | -0.01 | 0.18 | 0.41 | 0.02 | 0.28 | 0.25 | -0.01 | 1.00 | | | | | | | | |
| 12.log$TI_{it}$ | 1.58 | 6.18 | 0.61 | 0.32 | 0.00 | -0.00 | 0.00 | -0.00 | -0.00 | -0.00 | 0.47 | 0.13 | 0.00 | 0.11 | 1.00 | | | | | | | |
| 13.log$TI_{jt}$ | 5.55 | 8.24 | 2.53 | 0.66 | -0.37 | 0.49 | 0.17 | 0.01 | 0.39 | 0.24 | 0.49 | 0.76 | 0.02 | 0.43 | 0.23 | 1.00 | | | | | | |
| 14.$OPEN_{jt}$ | 1.96 | 1.34 | 0.48 | 0.34 | -0.21 | 0.30 | 0.11 | 0.00 | 0.16 | 0.11 | 0.35 | 0.31 | 0.10 | 0.21 | 0.42 | 0.58 | 1.00 | | | | | |
| 15.$FTA_{jt}$ | 9.28 | 0.13 | 0.34 | 0.56 | 0.27 | -0.34 | 0.14 | -0.34 | 0.25 | 0.03 | 0.15 | 0.32 | -0.79 | -0.12 | 0.02 | 0.06 | -0.08 | 1.00 | | | | |
| 16.log$POP_{it}$ | 1.24 | 18.15 | 0.73 | 0.05 | -0.18 | 0.11 | -0.07 | -0.09 | 0.03 | -0.06 | -0.01 | -0.09 | 0.02 | -0.10 | 0.11 | -0.02 | 0.01 | 0.05 | 1.00 | | | |
| 17.log$POP_{jt}$ | 4.95 | 15.41 | 2.56 | 0.77 | -0.08 | 0.11 | 0.21 | -0.14 | 0.23 | 0.18 | 0.65 | 0.75 | -0.24 | 0.05 | 0.20 | 0.54 | 0.21 | 0.42 | 0.08 | 1.00 | | |
| 18.$ER_{ijt}$ | 1.58 | 10.43 | 12.73 | 0.05 | -0.18 | 0.29 | -0.15 | 0.26 | 0.07 | 0.07 | -0.01 | -0.03 | 0.21 | 0.42 | 0.11 | 0.12 | 0.16 | -0.23 | 0.06 | -0.12 | 1.00 | |
| 19.$BORDER_{ij}$ | 9.61 | 0.12 | 0.32 | 0.50 | 0.31 | -0.36 | 0.03 | -0.43 | 0.18 | 0.03 | 0.13 | 0.26 | -0.79 | -0.17 | -0.00 | 0.01 | -0.08 | 0.92 | 0.04 | 0.39 | -0.21 | 1.00 |

*Source: Our Survey (2021)*

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**Table 3. Estimated results using FGLS regression**

| Variables | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 | Model 7 |
|---|---|---|---|---|---|---|---|
| **Constant** | -7.19*** | -4.94*** | -5.05*** | -4.98*** | -5.80*** | -4.35*** | -4.16*** |
| | (1.31) | (1.45) | (1.57) | (1.57) | (1.56) | (1.55) | (1.51) |
| | | | | | | | **Independent variables** |
| **$PDI_j$** | | -0.00$^{n.s}$ | -0.00$^{n.s}$ | -0.01* | -0.00$^{n.s}$ | -0.00$^{n.s}$ | -0.01** |
| | | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
| **$IDV_j$** | | | -0.00$^{n.s}$ | -0.00$^{n.s}$ | -0.00$^{n.s}$ | -0.01** | -0.01*** |
| | | | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
| **$MAS_j$** | | | | 0.00$^{n.s}$ | 0.00** | 0.00* | 0.01*** |
| | | | | (0.00) | (0.00) | (0.00) | (0.00) |
| **$UAI_j$** | | | | | -0.01*** | -0.01*** | -0.01*** |
| | | | | | (0.00) | (0.00) | (0.00) |
| **$LTO_j$** | | | | | | 0.00*** | 0.01*** |
| | | | | | | (0.00) | (0.00) |
| **$IVR_j$** | | | | | | | 0.01*** |
| | | | | | | | (0.00) |

*(Continuous)*

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| **Control variables** | | | | | | | |
|---|---|---|---|---|---|---|---|
| **$logGDP_{it}$** | 0.22*** | 0.23*** | 0.23*** | 0.23*** | 0.23*** | 0.26*** | 0.27*** |
| | (0.04) | (0.04) | (0.04) | (0.04) | (0.04) | (0.04) | (0.04) |
| **$logGDP_{jt}$** | 0.24*** | 0.26*** | 0.26*** | 0.24*** | 0.25*** | 0.28*** | 0.32*** |
| | (0.05) | (0.05) | (0.05) | (0.05) | (0.05) | (0.05) | (0.05) |
| **$logDIS_{ij}$** | 0.35*** | 0.33*** | 0.34*** | 0.35*** | 0.31*** | 0.53*** | 0.19* |
| | (0.11) | (0.11) | (0.11) | (0.11) | (0.11) | (0.11) | (0.11) |
| **$logEDIS_{ijt}$** | 0.35*** | 0.34*** | 0.34*** | 0.34*** | 0.36*** | 0.33*** | 0.34*** |
| | (0.03) | (0.04) | (0.04) | (0.04) | (0.04) | (0.04) | (0.04) |
| **$logTI_{it}$** | 0.33*** | 0.34*** | 0.34*** | 0.34*** | 0.32*** | 0.32*** | 0.33*** |
| | (0.07) | (0.07) | (0.07) | (0.07) | (0.07) | (0.07) | (0.07) |
| **$logTI_{jt}$** | 0.14*** | 0.13*** | 0.13*** | 0.14*** | 0.14*** | 0.12*** | 0.09*** |
| | (0.03) | (0.03) | (0.03) | (0.03) | (0.03) | (0.03) | (0.03) |
| **$OPEN_{jt}$** | $0.09^{n.s}$ | $0.09^{n.s}$ | $0.09^{n.s}$ | $0.07^{n.s}$ | $0.06^{n.s}$ | $0.07^{n.s}$ | $0.09^{n.s}$ |
| | (0.10) | (0.10) | (0.10) | (0.10) | (0.10) | (0.10) | (0.09) |
| **$logPOP_{it}$** | 0.10** | 0.09* | 0.09* | 0.09* | 0.09* | 0.10* | 0.14** |
| | (0.05) | (0.05) | (0.05) | (0.05) | (0.05) | (0.05) | (0.05) |
| **$logPOP_{jt}$** | 0.22*** | 0.21*** | 0.22*** | 0.21*** | 0.23*** | 0.20*** | 0.18*** |
| | (0.03) | (0.03) | (0.03) | (0.03) | (0.03) | (0.03) | (0.03) |
| **$ER_{ijt}$** | $0.00^{n.s}$ | 0.00* | 0.00* | 0.00** | 0.00*** | 0.00*** | 0.00*** |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
| **$BORDER_{ij}$** | 2.94*** | 2.95*** | 2.95*** | 2.98*** (0.20) | 2.65*** | 2.50*** | $2.33^{n.s}$ |
| | (0.20) | (0.20) | (0.20) | | (0.21) | (0.20) | (0.22) |
| **Log – Likelihood** | -691.72 | -690.78 | -690.70 | -689.37 | -681.091 | -678.50 | -666.09 |
| **Observation** | 572 | 572 | 572 | 572 | 572 | 572 | 572 |
| **P – value** | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

**, **, *** and n.s indicate statistically significant levels at 10%, 5%, 1% and non-significant. Standard errors are listed in parentheses.*

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*Source: Our survey (2021)*

There is a negative relationship between *individualism* ($\beta$ = -0.01; p<0.01), *uncertainty avoidance* ($\beta$ = -0.01; p<0.01) and bilateral trade value. The estimated coefficients of these two variables have statistical significance and show negative influences, in line with expectations when constructing the model. Countries with high uncertainty avoidance will be very cautious when participating in international trade, so trade barriers are also stricter. Penetrating these markets will become more difficult and require more time to establish a relationship. Besides, a society that connects the members is too loose, or society has few social relationships, it will restrict trade beyond the national scope.

*Indulgence* is found to positively affect bilateral trade ($\beta$ = 0.01; p<0.01). The hypothesis – there is a positive relationship between indulgence and bilateral trade value – is strongly supported. The higher indulgence will make consumers' demands more diversified, trade barriers will also simpler and looser, thereby facilitating the penetration of foreign goods, including Vietnam. *Mascunility* ($\beta$ = 0.01; p<0.01), *long term orientation* ($\beta$ = 0.01; p<0.01) are highly statistically significant and the effect of this variable on trade is positive. These results are consistent with previous empirical studies.

*Power distance* ($\beta$ = -0.01; p<0.05) is found to negatively affect bilateral trade. The result is contrary to the expectation, and this can be explained: most of the countries in the study have high PDI (over 70%), and in countries with high power distance, consumers are more likely to want products that help them demonstrate their status (Ghemawat and Reiche, 2011). Most of Vietnam's commercial products are simple and essential products as crude oil, rice, food, ... with low elasticity and Vietnam mainly exports processed and assembling products for foreign and imports materials serving the productive process. Therefore, PDI, in this case, is contrary to the hypothesis.

*Vietnam's GDP* ($\beta$ = 0.27; p<0.01) và *partners' GDP* ($\beta$ = 0.32; p<0.01), *economic distance* ($\beta$ = 0.34, p<0.01), *Vietnam's technological innovation* ($\beta$ = 0.33, p<0.01) and *partners' technological innovation* ($\beta$ = 0.09, p<0.01), *Vietnam's population* ($\beta$ = 0.14, p<0.05) và *partners' population*($\beta$ = 0.18, p<0.01), *exchange rate* ($\beta$ = 0.00, p<0.01) and *common border* ($\beta$ = 2.33, p<0.01) are found to have positive effects on bilateral trade.Estimated results obtained from the model in this study has similarities with previous studies in the application of gravity model to evaluate bilateral trade.

*Geographical distance* is found to affect bilateral trade positively ($\beta$ = 0.47, p<0.01). The result is contrary to the expectation because a great distance will increase costs and obstruct trade activities. The reason is that the distance variable in the model is taken as geographical distance (road), but transportation in Vietnam is mainly by sea. Besides, *openness* ($\beta$ = 0.09, p>0.1) turns out with expected sign and insignificant. This shows that the less importance of openness for Vietnam's bilateral trade.

## 5. CONCLUSION

In this study, we have found a significant national culture effect - represented by 6 Hofstede's cultural dimensions to bilateral trade between Vietnam and trading partner countries. The gravity model was estimated with the panel data from 52 countries from 2001 to 2011. Power distance, individualism and uncertainty avoidance have negative impacts on the bilateral trade of Vietnam. Masculinity, long-term orientation and indulgence are found to have positive impacts on bilateral trade. These results imply that to increase bilateral trade and success in foreign markets, Vietnam

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should enhance learning, researching thoroughly about partner countries' culture in which our country is competing to products and services that can meet consumers' real needs. It is possible to adjust the appropriate commercial strategies and apply commercial contract negotiation methods with partners more reasonably, minimize the potential risks that may arise, and enhance bilateral trade with other countries.

The results of this study contribute a new step in the research and provide a clearer perspective on the impact of "national culture" on a country's bilateral trade. However, this study also has some limitations: the study period is not long enough. The number of countries is not large enough compared to many types of research due to difficulties in terms of data when the author collected. Future research with large-scale data of space and time should be conducted and will undoubtedly give a universal result and fewer errors. Especially, future researchers could measure the national culture with other dimensions, such as by the GLOBE Project (2001), Schwartz (1999), Trompenaars (1993)./.

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