

CHAPTER III. METHODOLOGY

This section is divided into five parts. First the research model is given. Next the source of data is provided. After that three sets of regressions are performed. The first regression analyzes the ten cultural and regional variables against all six regions of the world totaling thirty countries. The second regression is to analyze the countries rich in human resources against countries rich in natural resources. These regions are Asia, Southeast Asia & Oceania, and the Middle East totaling fifteen countries. The third regression is to analyze countries that have had long trading relationships with the United States. These regions are Latin America, Europe, and Africa totaling fifteen countries. In each of the latter three sections, the empirical results are discussed.

3.1 Research Model

The use of econometrics as a way to measure culture has until now not been realized. The primary objective of this study is to build an econometrics model as a way to measure institutional change that arises from increased international trade. A model was built by Shih to measure the cultural change during institutional reform, a 15 year period from 1990-2004, for the countries that have the highest performance in international trade with the United States. This model chose the top five performing countries for international trade based on the summation of their trade of U.S. imports from the years 2000-2004. There are three sub objectives:

The first is to measure institutional change by taking cultural values and comparing them with economic performance. The original four cultural dimensions by Gerte Hofstede were used to test if the model proved any significant results.

The second sub-objective was to use country size in terms of population to gauge the rate of cultural change. This is a new indicator that was added to Hofstede's model. Large populations will have a slower rate of institutional change and generally a more closed market. This will have implications on the effects of the trade-institution relationship.

The third sub-objective was to perform a regional analysis with the intent of determining regional success in trade with the United States. Significant results different from zero show regional differences in trade through the use of regional trade agreements (EU, NAFTA, ASEAN, MERCOSUR, etc.). A regional analysis is needed to determine where future efforts are needed

to increase trade by encouraging foreign education and diplomacy to form institutional understanding.

Six regions were classified to group countries into regional clusters, characterized by being culturally similar or as having regional trade agreements. These regions are listed in Table 6. Data for regional performance with the United States for the years under study are shown in Table 7. The countries were chosen based on the sum of their international trade with the United States for the years 2000-2004. Countries exhibiting the highest amount of United States imports¹ were used to measure trade performance for all three types of trade: imports, exports, and balance of trade (exports minus imports). All countries under study were consistently in existence for this time period². The specific regression model used is

$$Y = f(x_i) = b_1 * x_1 + b_2 * x_2 + b_3 * x_3 + \dots + b_{10} * x_{10} + \varepsilon$$

From the neo-institutional perspective, cultural change can be measured on the national level by looking at a home nation's economic performance in international trade to other foreign nations correlated with changes in policy of the foreign nation. International trade is measured in three categories. Exports³ are divided into U.S. domestic exports denoted as Y_1 and U.S. total exports denoted by Y_2 . A significant result for both definitions provides greater clarity in gauging the effect of foreign goods on the U.S. market. Imports⁴ are divided into general

¹ Canada and Bermuda fell within the same geographical region as the United States. Due to the issue that this study wanted to measure culture change by comparing different cultural constructs these countries were eliminated from the study

² Germany is the one exception which was officially recorded as unified according to the data starting with the year 1991. The remaining countries were not subject to change as a result of the collapse of the Soviet Union or other political factors. In some instances, Taiwan is known as the Republic of China or Chinese Taipei. All data under study was used to fit under the name Taiwan. For business reasons the nations under study that are members of the European Union are known as European Business Communities. In this case the data were broadened to all members of the European Union which were classified as the European Communities by the WTO.

³ Domestic Exports: Commodities grown, produced or manufactured in the United States, including commodities imported from foreign countries that have been significantly changed or enhanced in value, in either the United States or a Foreign Trade Zone. Total Export: the total physical movement of merchandise out of the United States to foreign countries whether such merchandise is exported from within the United States Customs Territory or from a United States Customs bonded warehouse or a United States Foreign Trade Zone. Source: http://www.ita.doc.gov/TD/Industry/OTEA/trade_data_basics.html#exports

⁴ General Imports - This number measures the total value of merchandise shipments that arrive in the United States from foreign countries, whether such merchandise enters consumption channels immediately or is entered into

imports cost insurance freight value (CIF) denoted as Y_3 and general imports customs value denoted as Y_4 . Significant results on both classifications of general imports allows for the influence of shipping charges to be taken into account. To determine the balance of trade U.S. general imports CIF is subtracted from U.S. total exports denoted as Y_5 .

Table 6 Country Classification

Africa	Asia	South East Asia & Oceania
Egypt	Japan	Singapore
South Africa	Korea, Republic of	Australia
Nigeria	China	Malaysia
Algeria	Taiwan	Philippines
Morocco	Hong Kong	Thailand
Middle East	Europe	Latin America
Israel	United Kingdom	Mexico
Saudi Arabia	Germany	Brazil
Turkey	Netherlands	Venezuela
United Arab Emirates	France	Dominican Republic
Kuwait	Belgium	Columbia

The number of students studying in a country was used to measure the masculine cultural dimension denoted as x_1 . In one analysis, such as Table 9, x_1 signifies the number of American students studying abroad in the countries under study while in the other analysis for the set, such as in Table 10, x_1 signifies the amount of foreign students studying in the United States. The foreign students under study and host countries of Americans studying abroad come from the countries chosen in Table 6.

bonded warehouses or Foreign Trade Zones under Customs custody. Source: http://www.ita.doc.gov/TD/Industry/OTEA/trade_data_basics.html#exports
 The Customs Value is generally defined as the price actually paid or payable for merchandise when sold for exportation to the United States, excluding United States import duties, freight, insurance, and other charges incurred in bringing the merchandise to the United States. The c.i.f. (cost, insurance, and freight) value represents the landed value of the merchandise at the first port of arrival in the United States. It is computed by adding "Import Charges" to the "Customs Value" and therefore excludes United States import duties. Source: <http://www.fas.usda.gov/ustrade/USTTips.asp?QI=>

The higher the amount of students who leave a country in favor of pursuing knowledge outside their national boundary shows a higher level of masculinity. The underlying thinking here is that they are aggressively pursuing their interests for success in favor of staying at home and taking care of the family. This doesn't mean that they don't care for others or care for their family. In many instances it is the parents of the family that push their children for foreign study. This shows a change in family values because the children that go abroad are not able to stay and work to provide immediate financial support for their family. Therefore, aggressiveness for personal success is instilled in the children instead of personal sacrifice in favor of family support.

The other side to this is that countries that are actively recruiting students (in this case, American students) so that they become the host country of foreign students are also showing high levels of masculinity. These countries are aggressively trying to bring talent into the country and maybe even keep it there. An inverse meaning of masculinity for foreign student recruitment would mean that countries that are not aggressively trying to bring in foreign talent are focusing instead on the educational welfare of their own citizens.

H_{01} =Sending students abroad to another country has no effect on the home country's trade performance. Receiving students from abroad has no effect on the host country's economic performance.

H_{A1} =There is a significant difference in trade performance when sending/receiving students wanting to obtain an international education.

Membership in the WTO⁵ was used to measure a country's changing orientation on the issue on the scale of power distance denoted as x_2 . The benefits of membership in the GATT-WTO system are the consistency of trade rules and a forum for international trade discussion and dispute settlement. To join this system shows a desire for decreased power distance so that a system of rules for open, fair and undistorted power equality can be achieved. WTO members refuse to accept unequal distribution of power. This reduces transaction costs and reassures

⁵ GATT officially became the WTO in 1995. For the purpose of this study they are treated as the same organization.

nations of WTO policy enforcement. Nations who infringe upon the rights of others have to follow the directives of the ruling by the WTO.

H_{O2} =There is no difference in trade performance once a country enters the WTO.

H_{A2} =When a country enters the WTO there is significant difference in trade performance.

The number of disputes in the WTO against other member countries, denoted as x_3 , was used to determine how individualistic the nations were becoming. The amount of disputes was measured for how many disputes were filled against all member countries of the WTO and not just the United States. A WTO member country who actively sought to settle disputes by formal action against another member country shows a high level of individualism as it is looking after its own well-being in favor of caring about its relationship with the country under dispute. This implies that the country filing a dispute cares about its own rights enough so that it is willing to risk alienation and offend the country under dispute instead of resolving the situation in which a legally binding action would not result. Also, if one industry files a dispute, it could endanger the trade of the other industries within the country in question.

H_{O3} =There is no difference in the trade performance of a country due to a change in the amount of trade disputes filed against another member country of the WTO.

H_{A3} =The amount of disputes a country files against the WTO changes the trade performance of the country that filed the dispute.

Though it could be argued that membership into the WTO could also be an indicator of individuality since the country is actively seeing membership this is not believed the case since entry into the WTO is to give the option of settling disputes through a legal system. Disputes do not have to be taken as far as being formally filed. Instead the disputes could be resolved through diplomacy without the need for third party intervention. Therefore, entry in the WTO indicates the power to resolve conflicts not the action taken to resolve conflicts.

Country size in terms of population was used to increase the accuracy of defining areas of trade excellence denoted as x_4 . Population was categorized on a scale with regard to population size. Population is a deterrent of how fast a country can change its policy and also how much need there is for international trade. Population is a facet of culture and can affect the rate of knowledge dissemination plus the framework of the shared mental models. There all affect the rate of institutional change. For example, countries with large populations that import goods to the United States but don't buy imports are to be considered as large closed markets.

H_{O4} =Size of a country in terms of population does not have any effect on trade performance.

H_{A4} =Larger countries will show a difference in trade performance than smaller countries.

Language was tested as an indicator of uncertainty avoidance denoted as x_5 . The primary language of the United States is English. Countries that don't use English officially but continue to trade with the United States are exhibiting low uncertainty avoidance. If a country that is classified normally as having high uncertainty avoidance but is actively seeking trade agreements with nations across the language barrier, which could result in possible communication problems, then the nation is changing its orientation of uncertainty avoidance from a high categorization to a low one.

H_{O5}=The commonality or lack of the commonality of language has no effect on trade.

H_{A5}=There is significant difference between the use of a common language shared by two trading partners and their trade performance.

Increases and decreases of economic performance for the United States in terms regional trade agreements have an impact on U.S. trade performance and show region specific institutional differences. For the regression to compare six regions of the world: Africa is denoted as x_6 , Asia as x_7 , Southeast Asia & Oceania as x_8 , the Middle East as x_9 , and Europe as x_{10} . Latin America was used as the baseline. Regional trade agreements such as the European Union, MERSOCUR, or ASEAN could potentially explain international trade success. This has to be looked at in conjunction with the cultural variables so that accurate measurements can be attributed to either cultural values or regional values.

H_{O6}=There are no differences in trade performance due to regional differences.

H_{A6}=There are differences in trade performance due to regional differences.

The cultural and regional dimensions listed with the indicators for each variable can be seen in Table 8. Hofstede's model of institutional orientation was used to measure cultural values as country specific phenomena. However, in this model the added cultural variable of country size in terms of population and regional analysis allows other factors to be taken into account. The consensus of agreements pertaining to international trade with the United States is made relevant in this model. Figure 3 shows how to read the table in relation to the times series regression formula that was used.

Table 7 Economic Performance in 6 Regions

U.S. Domestic Exports (in 1,000 USD)						
Year	Africa	Asia	SE Asia & Oceania	Middle East	Europe	Latin America
1990	5,869,691,072	82,211,407,799	24,359,734,534	10,468,277,016	74,849,495,396	38,970,192,378
1995	7,525,373,396	127,797,935,209	43,312,304,742	16,693,152,896	88,491,025,359	67,523,799,091
2000	8,211,280,251	137,000,171,953	52,601,425,438	18,545,178,593	117,621,785,233	127,603,085,934
2004	8,922,171,245	140,419,744,690	53,937,756,163	18,890,578,068	115,890,462,595	118,223,217,617

U.S. Total Exports (in 1,000 USD)						
Year	Africa	Asia	SE Asia & Oceania	Middle East	Europe	Latin America
1990	5,977,358,781	86,113,514,584	25,441,600,642	10,887,318,892	79,156,384,607	40,241,180,619.00
1995	7,633,733,345	134,974,914,090	46,621,178,266	17,815,347,144	94,461,533,139	70,041,114,202.00
2000	8,524,582,383	148,414,716,480	56,704,587,845	20,794,648,532	127,009,899,147	140,764,634,778.00
2004	9,324,409,504	152,994,651,904	58,203,409,794	23,387,513,895	129,743,328,940	138,267,487,823.00

U.S. General Imports CIF (in 1,000 USD)						
Year	Africa	Asia	SE Asia & Oceania	Middle East	Europe	Latin America
1990	11,547,587,261	163,233,578,879	29,596,772,161	16,981,265,132	73,308,511,631	54,556,395,702
1995	10,083,127,224	241,509,054,423	59,662,411,800	18,618,439,885	96,509,038,143	90,115,724,777
2000	19,705,275,887	354,211,417,142	84,582,553,779	35,565,799,742	155,492,984,456	183,505,543,854
2004	33,198,252,126	437,672,567,616	80,787,572,210	47,301,481,499	185,369,817,657	219,277,962,177

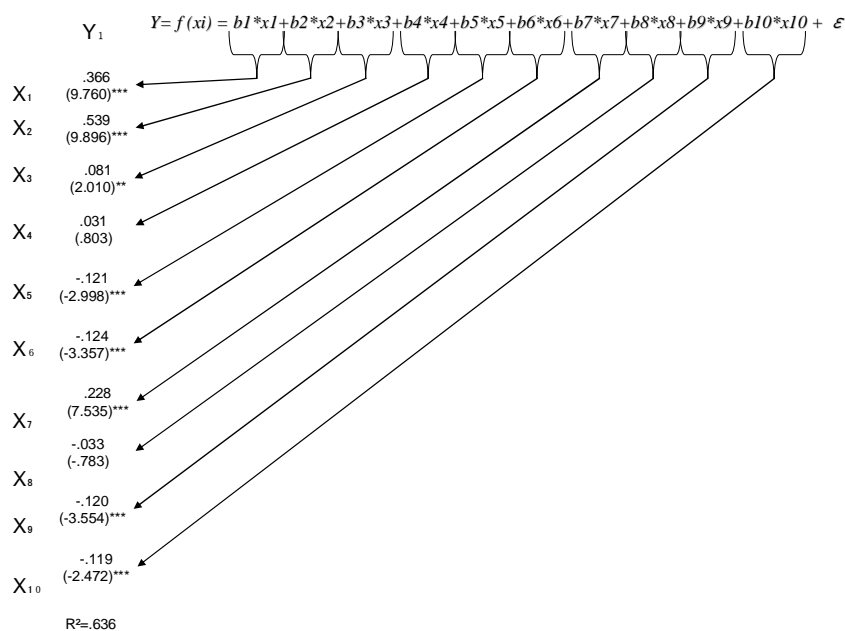
U.S. General Imports CV (in 1,000 USD)						
Year	Africa	Asia	SE Asia & Oceania	Middle East	Europe	Latin America
1990	10,828,740,597	156,298,345,868	28,220,968,561	15,925,623,551	70,861,263,975	52,516,958,742
1995	9,492,276,446	232,585,652,487	57,723,967,017	17,543,894,974	93,343,184,216	87,383,872,079
2000	18,809,173,279	338,906,227,838	81,519,302,893	33,969,561,411	151,612,462,673	179,766,663,747
2004	31,444,459,267	416,387,329,331	77,756,085,857	44,758,539,848	180,504,795,124	213,783,738,954

U.S. Exports minus Imports (in 1,000 USD)						
Year	Africa	Asia	SE Asia & Oceania	Middle East	Europe	Latin America
1990	-5,570,228,480	-77,119,085,473	-4,155,171,519	-6,093,946,240	5,848,193,163	-14,315,215,083
1995	-2,449,393,879	-106,534,671,043	-13,041,233,534	-803,092,741	-2,047,264,325	-20,074,780,843
2000	-11,180,395,909	-205,794,953,066	-27,877,826,437	-14,771,151,210	-28,483,615,654	-42,740,824,690
2004	-23,874,181,161	-284,673,170,241	-22,584,424,685	-23,913,935,521	-55,626,550,931	-81,009,614,433

Table 8 Cultural and Regional Variables

Cultural Variables		
X ₁	Masculinity variable	number of foreign students sent study abroad in the U.S.A/ number of American students abroad per given year
X ₂	Power distance	1 = years of WTO membership, 0 = years not a WTO member
X ₃	Individualism	amount of disputes has within the WTO per given year
X ₄	Size	population size from 2004 estimate
X ₅	Uncertainty avoidance	1=English as official language 0=English not an official language
Regional Variables		
X ₆	Africa	1 = African countries, 0 = non-African countries
X ₇	Asia	1 = Asian countries, 0 = non-Asian countries
X ₈	Southeast Asia & Oceania	1 = Southeast Asian & Oceanian countries, 0 = non-Southeast Asian & Oceanian countries
X ₉	Middle East	1 = Middle Eastern countries, 0 = non-Middle Eastern countries
X ₁₀	Europe	1 = European countries, 0 = non-European countries

Figure 3 Reading the Table



3.2 Source of Data

All data on trade performance of the United States was provided from the trade database of the United States International Trade Commission (<http://www.usitc.gov/>). Data for WTO membership and amount of disputes filed for each country were obtained from the WTO website: (http://www.wto.org/english/thewto_e/whatis_e/tif_e/org6_e.htm)

Information pertaining to WTO members before 1995 was provided by the official website of GATT which is now located at Stanford University in the United States: (<http://gatt.stanford.edu/bin/browse/docs.jsessionid>)

Country of origin and amount of students studying in the United States/amount of American students studying abroad per given year were provided by the International Institute of Education CD-ROM and website: (<http://opendoors.iienetwork.org/?p=69735>).

Official language lists and population numbers were compared from the CIA Factbook (<https://www.cia.gov/cia/publications/factbook/index.html>) and Encyclopedia America Online (<http://ea.grolier.com/>) using the 2004 information and estimates.