THE ROLE OF HUMAN CAPITAL IN NETWORKS EFFECTS: EVIDENCE FROM U.S. EXPORTS

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Abstract

Previous literature suggested that immigrants have a positive impact on international transactions such as exports. However, even though previous studies emphasize the role of individual and families in enhancing networks effects, none of these studies, surprisingly, have considered heterogeneity of immigrants. Since each individual has different social and educational backgrounds, the impact of immigrants on exports may differ among individuals depending on their personal attributes. The main contribution of this paper is to go one step further in discussing the role of immigrants in enhancing host country exports. This research attempts to answer the question whether all immigrants encourage host country exports. Using U.S. state-level data, I find that the human capital level of immigrants plays an important role in enhancing U.S. exports. Furthermore, using the data-sorting method developed by Hansen (2000), I find that immigrants from countries with a high level of human capital increase U.S. exports while immigrants from countries with a low level of human capital do not.

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Introduction

There have been many theoretical and empirical efforts inquiring into the connection between immigrants and international trade. These efforts suggest and find evidence that interactions between people in the same ethnic groups in different countries can affect the international flow of economic variables. From a business perspective, ethnic networks strengthen the business link among the same ethnic people around the world. For example, Rauch and Trindade (1999) find a significant positive effect of Chinese ethnic networks on bilateral trade between China and Southeast Asian countries. More recently, Girma and Yu (2000) focus on the relationship between immigration and trade in the case of the United Kingdom and find that immigrants from former British colonies do not have a substantial impact on exports, while immigrants from other parts of the world have a significant positive effect on exports.

Wagner, Head, and Ries (2002) and Dunlevy (2004) have extended the study of the connection between immigration and international trade to the sub-national level. In his 2004 paper, Dunlevy emphasizes that the extension of study to the sub-national level is important because the connection between immigration and international trade depends on networks of individuals and families. Using U.S. state-level data, Dunlevy confirms that there is an important pro-trade role of immigrants in U.S. exports.

Even though previous studies emphasize the role of individuals and families in enhancing networks effects, none of these studies, surprisingly, have considered heterogeneity of immigrants. The main reason why immigrants increase host country exports to their home country is that immigrants may have information about their home markets and/or have an ability to establish new business connections to their home country with low transaction costs. Since each individual has different social and educational backgrounds, the impact of immigrants on exports may differ among individuals depending on their personal attributes. Similarly, immigrants from different countries may have a different influence on exports.

The main contribution of this paper is to go one step further in discussing the role of immigrants in enhancing host country exports. This research attempts to answer the question of whether all immigrants encourage host country exports. Using U.S. state-level data, I find that the human capital level of immigrants plays an important role in enhancing U.S. exports. Furthermore, using the data-sorting method developed by Hansen (2000), I find that immigrants from countries with a high level of human capital increase U.S. exports, while immigrants from countries with a low level of human capital do not.

This paper is organized as follows. The next section describes my empirical methodology and data. Section three presents the empirical results. Section four discusses the robustness and section five concludes.

The Model and Data

Empirical Methodology

The model which I use for the empirical analysis is based on a standard gravity model of international trade. The standard gravity model predicts that the volume of trade between two countries depends on the product of their economic size and the distance between them. Every country has its own share of world demand and supply, so each country consumes not only its own products, but also those of foreign countries in proportion to its economic size. The distance between countries reflects all feasible obstacles to trade including transportation costs. The standard gravity model can be written as:

$$VT_{ijt} = \alpha\ (GDP_{it}GDP_{jt})^{\beta}(DISTANCE_{ij})^{\gamma} \exp(u_{ijt}) \qquad (1)$$

where VT_{ijt} is the volume of trade between countries i and j in period t; GDP_{it} is gross domestic product of country i in period t; $DISTANCE_{ij}$ represents the distance between countries i and j; u_{ijt} is a Gaussian white noise error term.

The standard gravity model specification has been frequently modified to be consistent with various economic research efforts.[1] Since I examine the effect of immigrants upon exports of the U.S. states, I modify equation (1) to implement my model. First, I use gross state product (GSP) to measure the economic size of each state. Second, based on previous literature, I include dummy variables affecting the volume of exports

[1] Frankel (1997) provides a nice summary of works using gravity models.

such as *OCEAN* and *ADJACENT*.[2] Third, the new equation contains information on both quantity and quality of immigrants to test the main hypothesis. The new model can be written as follows:

$$EXPORT_{ijt} = \alpha\,(GSP_{it}GDP_{jt})^{\beta}(DISTANCE_{ij})^{\gamma}(IMMIGRANTS_{ijt})^{\delta}(SCHOOL_{j})^{\zeta}$$
$$\exp(\theta ADJACENT_i + \lambda OCEAN_i + u_{ijt}) \qquad (2)$$

where

$EXPORT_{ijt}$ denotes the dollar value of exports from state i to country j in period t;

GSP_{it} and GDP_{jt} denote, respectively, gross state product of state i and gross domestic product of country j in period t;

$DISTANCE_{ij}$ denotes the great circle distance between the capital cities of state i and country j;

$IMMIGRANTS_{ijt}$ denotes the number of immigrants from country j to state i in period t;

$SCHOOL_j$ denotes the average years of schooling of country j in 2000;

$ADJACENT_i$ equals one if state i shares its land border with a foreign country and zero otherwise;

$OCEAN_i$ equals one if state i has seaports and zero otherwise;

u_{ijt} is a Gaussian white noise error term.

To implement my gravity model, I take natural logs on both sides of equation (2), which provides the following estimation equation:

[2] See Gould (1994), Frankel (1997), and Girma and Yu (2002) for theoretical foundations.

$$\ln EXPORT_{ijt} = \alpha + \beta \ln(GSP_{it}GDP_{jt}) + \gamma \ln(DISTANCE_{ij}) + \delta \ln(IMMIGRANTS_{ijt})$$

$$(+) \qquad (-) \qquad (+)$$

$$+ \zeta \ln(SCHOOL_j) + \theta\,(ADJACENT_i) + \lambda\,(OCEAN_i) + u_{ijt} \qquad (3)$$

$$(+) \qquad (+) \qquad (+)$$

To accord with the prediction of conventional gravity models and my main hypothesis, I expect that all coefficients of equation (3) are positive except the coefficient of the $DISTANCE_{ij}$ variable.

Data

The final sample for empirical investigation contains 31 foreign countries and 51 U.S. states including the District of Columbia.[3] The data set is unbalanced and comprises 3 years from 1999 to 2001 when available. As a result, the data set has 4173 observations and descriptive statistics for the entire sample are presented in Table 1.

Table 1

The export data are the current dollar value of U.S. state exports and are available from the U.S. Census Bureau database.[4] This data set comes from the origin of movement (OM) series, so the data reflect the transportation origin of exports.

[3] The District of Columbia is considered here as a state.

[4] http://www.census.gov/foreign-trade/aip

GSP data are obtained from the U.S. Department of Commerce database.[5] Data on GDP of 31 foreign countries come from the United Nations database.[6] Since Taiwanese GDP data are not available in the UN database, I use the data reported by the Taiwanese Bureau of National Statistics.[7] All the values used for GSP and GDP are millions of current dollars.

Distance is the great circle distance in kilometers between the capital cities of 51 U.S. states and 31 foreign countries. These data are available from 'BALI & INDONESIA ON THE NET.'[8] Appendix A.1 lists the capital cities of U.S. states and foreign countries.

The immigration data are the number of immigrants from foreign countries into each of the U.S. states. These data are flow variables and are available in 'Yearbook of Immigration Statistics' published by U.S. Department of Homeland Security.[9,10]

The school data contain the average schooling years in the total adult population aged 25 and over. This data set comes from Barro and Lee (2000). Since Barro and Lee (2000) report their data set quinquennially over 1960 to 2000, 2000 is used for my empirical analysis.

[5] http://www.bea.doc.gov

[6] http://unstats.un.org

[7] http://eng.stat.gov.tw

[8] http://www.indo.com/distance

[9] http://www.dhs.gov

[10] To test the robustness of my findings, I consider alternative constructions of these variables, such as a cumulative flow variable. Details are given in section four.

Empirical Results

The main purpose of my empirical investigation is to estimate the effects of human capital on business networks. In particular, as discussed in section two, I examine whether the quality and quantity of immigrants interact with each other to increase international transaction such as exports. In addition, I also test whether the ethnic networks model prediction is valid with state-level data.

Immigrants and Human Capital: OLS

The standard gravity model prediction accords with state-level exports data. Table 2 shows that all regressions have statistically significant F-statistics for overall joint significance of the regressors. All coefficients, except the *ADJACENT* variable, have the expected sign, and each is statistically significantly different from zero.

All coefficients on the logarithms of the product of GSP and GDP are statistically positive. Regression 2.1 shows that the product of GSP and GDP variable increases exports of the U.S. states by 1.2 percentage points. Inclusion of other relevant variables drops the magnitude of the product of GSP and GDP on exports from 1.2 to 0.92 percentage points. Regression 2.6 indicates that exports of a state increases, on average, by $18,400 when both GSP and GDP increase by one million U.S. dollars. From 1999 to 2000, for example, the total gross state product of California increases by $107 billion while the GDP of South Korea increases by $66 billion. According to the model's prediction, exports of the state of California to South Korea increases by $163 million in the year of 2000, which is economically significant.

Table 2

All coefficients on the logarithm of the *DISTANCE* variable are statistically negative in every regression equation. The elasticities of the *DISTANCE* variable have a range from -1.33 to -1.53, which are similar to previous findings. All five coefficients on the *OCEAN* variable are positive and statistically significantly different from zero. Since export data reflects the transportation origin of exports, it does not represent the production of origin. Furthermore, most exports occur through seaports, so it is necessary to include a dummy variable capturing the differences between inland and seaside states. All five coefficients on *OCEAN* variable confirm the common belief that seaside states export more than inland states on average.

Since the U.S. shares her border with Canada and Mexico and most of the existing literature uses country-level data, the *ADJACENT* variable is commonly used to estimate the impact of North American Free Trade Agreement (NAFTA) on the U.S. exports and imports. Previously, the coefficients on *ADJACENT* variable have been statistically positive in most country-level data analyses, which supports the positive effects of NAFTA on trade among the U.S., Canada, and Mexico. In this research, however, all five coefficients on *ADJACENT* variable are negative and statistically insignificant. Therefore, the state-level data do not support NAFTA effects. Table 3 shows the top and bottom ten exporting states in 2000. All top five states share their border with a foreign country. At the same time, however, three states from the bottom ten also share their border with a foreign country. For example, the state of Montana is one of the lowest exporting states even though she shares her border with Canada.

Table 3

Regression 2.3 supports the economic impact of ethnic networks on international trade. The coefficient on the logarithm of the *IMMIGRANTS* variable is positive and statistically significantly different from zero. The elasticity of the *IMMIGRANTS* variable is 0.117. On average, one additional immigrant increases exports of a state to the immigrant's home country by $74,000. For example, 217,753 new immigrants came into the state of California in 2000, so according to the model's prediction exports of the state of California to the rest of world increases by $16 billion, which is 13.4 percent of total Californian exports.

The specification in regression 2.5 replaces *IMMIGRANTS* variable by the product of *IMMIGRANTS* and *SCHOOL* variables. Since I use the *SCHOOL* variable as the measure of human capital, the interaction term represents the effective number of immigrants. The coefficient on the logarithms of the product of *IMMIGRANTS* and *SCHOOL* variables is positive and statistically highly significant. Since the omission of relevant variables could make the significance of the interactive term, I include both *IMMIGRANTS* and the interaction variable in regression 2.6. The coefficient on the logarithm of *IMMIGRANTS* variable is statistically negative while the interaction variable is statistically positive. Even though the *IMMIGRANTS* variable has a negative coefficient, the elasticity is still positive.[11] The elasticity of *IMMIGRANTS* variable is 0.207 while the interaction variable is 1.249. The magnitude of the interactive term is

[11] $\ln(exp) = \alpha + \beta \ln(immi) + \gamma \ln(immisch)$
$= \alpha + \beta \ln(immi) + \gamma [\ln(immi) + \ln(sch)]$
$= \alpha + \beta \ln(immi) + \gamma \ln(immi) + \gamma \ln(sch)$
$= \alpha + (\beta+\gamma) \ln(immi) + \gamma \ln(sch)$

approximately six times larger than that of *IMMIGRANTS* variable. Therefore, as a conclusion, the contribution of immigrants to exports contains two effects. First, immigrants increase exports from the U.S. states to their home country. Second, the level of human capital of immigrants intensifies the effects of immigrants on exports.

Fixed-Effects Estimates

I next estimate the gravity model with state and country fixed effects. Random effects estimation is not reported since Hausman tests show that the random effects model is not appropriate in this case. Table 4 shows that all regressions have statistically significant F-statistics for overall joint significance of the regressors. All coefficients on the logarithms of the product of GSP and GDP have the expected positive sign, and each is statistically significantly different from zero. All coefficients on the logarithms of the *DISTANCE* variable are statistically negative in every regression equation.

Table 4

Regression 4.1 and 4.2 show the results of the gravity model including state fixed effects. The results indicate that the effects of immigrants on exports remain unchanged. The elasticity of *IMMIGRANTS* variable is 0.291 while the interaction variable is 1.461, which is similar to results from OLS.

In contrast, the coefficient on the interaction variable is not statistically different from zero with country fixed effects. Regression 4.4 shows that the coefficient on the

interaction variable has the expected positive sign, but it is not statistically significant. These empirical findings suggest that there is no strong statistical evidence that immigrants increase the U.S. exports.

Regression 4.5 includes both state and country fixed effects. Inclusion both state and country effects yields the highest R^2. All coefficients on the major variables have the expected sign. Although it is statistically insignificant, the coefficient on the *ADJACENT* variable now has a positive sign. The coefficient on *IMMIGRANTS* is negative, although insignificant, while the interaction variable has a statistically significant positive coefficient. These results indicate that first, immigrants have overall positive effects on the U.S. exports. Second, the magnitude of these effects depends on the human capital level of immigrants.

Country Heterogeneity: Average Schooling Years as a Threshold Variable

Both OLS and fixed effects estimations report that the level of human capital of immigrants plays an important role in increasing the U.S.exports. Since I use the average years of schooling as an index of level of human capital, it is of interest to find if there is a threshold point or not.[12]

[12] Since there is no reliable source of the education/skill level of the immigrants, I use the source-country's education level as a proxy variable. This sample selection problem could bring a bias to my estimates. For example, if all immigrants are skilled labor (or unskilled labor) regardless of source country, then using the source-country's education level as a threshold variable simply separates countries by their social development stage not the skill level of immigrants. Therefore, a possible extension of this chapter would be to consider a new proxy variable such as immigrant earnings and examine the existence of heterogeneity in networks effects.

In this section, I use the data-sorting method developed by Hansen (2000) which allows me to split my data endogenously using the *SCHOOL* variable.[13] My threshold model selection rejects the null hypothesis of no threshold point, and finds 1.9925 as the threshold point with the best fit.[14] Figure 1 presents F-tests against the logarithms of *SCHOOL* variable.

Figure 1

Since this threshold value is equivalent to 7.33 years of schooling, it divides my entire sample of 24 countries into a high-schooling years group with 9 countries and a low-schooling years group with 15 countries.[15] Table 5 shows the countries in each group determined by threshold estimation.

Table 5

I next estimate equation (3) for the two groups. Table 6 presents estimates for each group. For the countries in the high group, the coefficient on the logarithms of the *IMMIGRANTS* variable is positive and statistically significantly different from zero, which accords with networks effects prediction. On the other hand, for the countries in the low

[13] See Hansen (2000) for a detailed discussion on the statistical theory for threshold estimation.

[14]

F-Test for No Threshold	313.5360
Achieved at LSCHOOL	1.9925
Number of Bootstrap Replications	1000
Bootstrap P-Value	0.0000

[15] 7 countries without average years schooling information are excluded from the data set.

group, the coefficient on the logarithms of the *IMMIGRANTS* variable is not statistically significant, although positive. Hence there is no statistical evidence that immigrants from the countries in the low group increase U.S. exports.

Table 6

These empirical findings clearly suggest that first, immigrants from countries with high level of human capital increase international transaction such as exports. Second, there is no statistical evidence that immigrants with low level of human capital such as unskilled labor increase U.S. exports. Third, country heterogeneity clearly exists in networks effects.

Robustness

An annual flow of immigrants is used as the main regressor in section three. According to the prediction by networks effects, immigrants have not only temporary effects, but also cumulative permanent effects. Therefore, it is necessary to consider the cumulative impact of immigrants on U.S. exports. In this section, I present alternative specifications to test the robustness of my findings.

Table 7 shows the cumulative ethnic networks effects on U.S. exports. The *IMMIGRANTS* variable now denotes the total number of immigrants from 1997 to 2004 while the dependent variable equals U.S. state exports in 2004. Compared to the main findings in section three, the results basically remain the same while the magnitude of networks effects on U.S. exports is larger than before.

Table 7

Table 8 presents the threshold effect of immigrants on U.S. exports. The coefficient on the logarithm of the *IMMIGRANTS* variable is not statistically significant for the countries in the low group.[16] On the other hand, the coefficient on the logarithms of the *IMMIGRANTS* variable for the countries in the high group is statistically significant and positive. For the countries in the high group, the magnitude of the coefficient on the logarithms of the *IMMIGRANTS* variable is 2.1 times greater than the coefficient in section three.

Table 8

[16] Countries whose average years of schooling is less than 7.334 are in this group.

Conclusions

This paper investigates the impact of immigrants on U.S. exports. Compared to previous literature, this paper's contribution is to consider the level of human capital to capture country heterogeneity in networks effects. Using the average years of schooling as the index of level of human capital, Hansen's data-sorting method allows me to find a threshold point and test whether the level of human capital plays important role in enhancing networks effects.

The results suggest that first, while the standard gravity model prediction is supported by state-level data, immigrants have overall positive effects on U.S. exports. Second, the magnitude of these effects depends on the human capital level of immigrants. Third, the immigration of skilled labor increases international transaction such as exports while there is no statistical evidence that immigration of unskilled labor increases U.S. exports, which ascertain the existence of heterogeneity in networks effects.

This research finds the existence of heterogeneity in networks effects. Since there is no reliable source of the education/skill level of the immigrants, I use the source-country's education level as a proxy variable. This sample selection problem could bring a bias to my estimates. For example, if all immigrants are skilled labor (or unskilled labor) regardless of source country, then using the source-country's education level as a threshold variable simply separates countries by their social development stage not the skill level of immigrants. Therefore, an extension of this chapter would be to consider a new proxy variable such as immigrant earnings and examine the existence of heterogeneity in networks effects.

Table 1: Descriptive Statistics

Variable	*Obs*	*Mean*	*Std. Dev.*	*Min*	*Max*
Exports	4173	294.3922	1629.975	0	47761.02
Immigrants	4173	468.4098	2749.192	0	97293
GSP	4173	193612.8	225850.4	16062	1307880
GDP	4173	324545	606368.7	3683.98	4162360
Distance (km)	4173	7482.765	3953.254	226.5535	16255.71
School	3319	6.322567	2.627898	2.449	11.434
Ocean	4173	.594057	.4911324	0	1
Adjacent	4173	.2933142	.4553358	0	1

Table 2: OLS Estimates of Ethnic Networks Effects on U.S. State Exports

Independent Variable	*2.1*	*2.2*	*2.3*	*2.4*	*2.5*	*2.6*
lgspgdp	1.226	1.205	1.142	0.923	1.071	0.923
	(85.11)**	(81.56)**	(63.21)**	(42.10)**	(53.74)**	(42.10)**
ldist	-1.533	-1.507	-1.451	-1.333	-1.400	-1.333
	(36.32)**	(35.62)**	(33.69)**	(31.84)**	(32.55)**	(31.84)**
ocean		0.354	0.226	0.318	0.166	0.318
		(5.81)**	(3.51)**	(5.14)**	(2.63)**	(5.14)**
adjacent		-0.042	-0.043	-0.090	-0.051	-0.090
		(0.66)	(0.68)	(1.48)	(0.81)	(1.48)
limmi			0.117	0.207		-1.041
			(6.00)**	(10.61)**		(14.21)**
limmisch					0.200	1.249
					(9.91)**	(16.35)**
lschool				1.249		
				(16.35)**		
Constant	-12.311	-12.256	-11.680	-10.229	-11.114	-10.229
	(29.07)**	(29.08)**	(27.18)**	(24.29)**	(25.82)**	(24.29)**
R-squared	0.72	0.72	0.72	0.74	0.73	0.74
F-Statistic	3719.27	1888.14	1535.59	1439.47	1579.70	1439.47
Prob.(F-Statistics)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

The numbers in the brackets are absolute value of t-statistics. ** indicates significance at 1% level of significance. * indicates significance at 5% level of significance.

Table 3: State Exports in 2000

	State (Top 10)	*Border (Y/N)*	*State (Bottom 10)*	*Border (Y/N)*
1	California	Y	Hawaii	N
2	Texas	Y	Wyoming	N
3	New York	Y	Montana	Y
4	Michigan	Y	North Dakota	Y
5	Washington	Y	South Dakota	N
6	Illinois	N	District of Columbia	N
7	Florida	N	Rhode Island	N
8	Ohio	N	Nevada	N
9	Massachusetts	N	Maine	Y
10	Pennsylvania	N	Delaware	N

Table 4: Fixed-Effects Estimates of Ethnic Networks Effects on U.S. State Exports

Independent Variable	*4.1 State Fixed-Effects*	*4.2 State Fixed-Effects*	*4.3 Country Fixed-Effects*	*4.4 Country Fixed-Effects*	*4.5 State and Country Fixed-Effects*
lgspgdp	1.175	0.820	1.371	1.338	0.436
	(78.70)***	(39.92)***	(54.05)***	(35.97)***	(1.74)*
ldist	-1.424	-1.189	-1.762	-1.751	-1.230
	(35.91)***	(31.38)***	(19.90)***	(19.67)***	(14.81)***
ocean			0.224	0.217	2.936
			(4.23)***	(4.06)***	(2.75)***
adjacent			-0.030	-0.034	0.757
			(0.60)	(0.67)	(1.23)
limmi		-1.170			-0.240
		(16.55)***			(0.97)
limmisch		1.461		0.025	0.437
		(20.78)***		(1.21)	(1.77)*
Constant	-12.072	-9.639	-13.801	-13.279	0.935
	(30.13)***	(25.19)***	(13.96)***	(12.31)***	(0.18)
R-squared	0.68	0.73	0.63	0.63	0.88
F-Statistic	3158.08	2009.61	1240.72	993.11	294.43
Prob. (F-Statistic)	0.0000	0.0000	0.0000	0.0000	0.0000

The numbers in the brackets are absolute value of t-statistics. *** indicates significance at 1% level of significance. ** indicates significance at 5% level of significance. * indicates significance at 10% level of significance.

Table 5: Country Classification

	High Group *Average Years Schooling ≥ 7.334*	*Low Group* *Average Years Schooling < 7.334*
1	Canada	Bangladesh
2	Germany	Brazil
3	Japan	China
4	Korea	Columbia
5	Peru	Dominican Republic
6	Philippines	Ecuador
7	Poland	El Salvador
8	Taiwan	Guatemala
9	United Kingdom	Haiti
10		India
11		Iran
12		Jamaica
13		Mexico
14		Nicaragua
15		Pakistan

Table 6: Regressions for the Two Groups

Independent Variable	*High Group*	*Low Group*
lgspgdp	1.152	1.142
	(6.75)**	(8.13)**
ldist	-0.668	-1.285
	(4.15)**	(4.36)**
limmi	0.159	0.053
	(2.23)*	(1.02)
ocean	0.300	0.534
	(0.75)	(0.81)
adjacent	-0.094	-0.865
	(0.30)	(1.84)
Constant	-19.593	-18.805
	(4.44)**	(4.64)**
R-squared	0.89	0.87
F-Statistic	47.70	51.13
Prob. (F-Statistic)	0.0000	0.0000

The numbers in the brackets are absolute value of t-statistics. ** indicates significance at 1% level of significance. * indicates significance at 5% level of significance.

Table 7: Cumulative Ethnic Networks Effects on 2004 U.S. State Exports

Independent Variable	*7.1*	*7.2*	*7.3*	*7.4*
	OLS	***State Fixed-Effects***	***Country Fixed-Effects***	***State and Country Fixed-Effects***
lgspgdp	0.839	0.673	1.448	0.563
	(14.93)**	(12.03)**	(18.54)**	(3.87)**
ldist	-1.463	-1.286	-1.864	-1.259
	(15.10)**	(13.79)**	(11.11)**	(7.74)**
ocean	0.273		0.220	1.688
	(1.89)		(2.14)*	(4.78)**
adjacent	-0.215		-0.135	-0.183
	(1.52)		(1.41)	(0.68)
limmi	-1.018	-1.149		-0.772
	(5.75)**	(6.51)**		(2.23)*
limmisch	1.380	1.671	0.019	1.040
	(7.33)**	(9.22)**	(0.43)	(2.87)**
Constant	-9.051	-8.089	-15.394	-2.917
	(8.96)**	(8.28)**	(7.32)**	(0.92)
Observations	967	967	967	967
R-squared	0.64	0.57	0.63	0.88
F-Statistic	285.08	306.57	317.14	98.48
Prob. (F-Statistic)	0.0000	0.0000	0.0000	0.0000

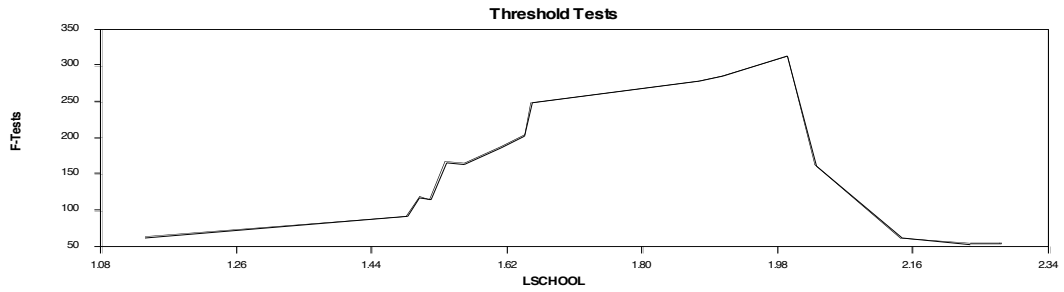
The numbers in the brackets are absolute value of t-statistics. ** indicates significance at 1% level of significance. * indicates significance at 5% level of significance.

Table 8: Regressions for the Two Groups

Independent Variable	*High Group*	*Low Group*
lgspgdp	0.934	1.293
	(15.52)**	(17.17)**
ldist	-0.829	-2.988
	(8.68)**	(17.81)**
limmi	0.334	0.114
	(6.07)**	(1.74)
ocean	-0.212	0.463
	(1.27)	(2.49)*
adjacent	0.123	-0.187
	(0.77)	(1.01)
Constant	-13.293	-3.193
	(7.55)**	(2.53)*
Observations	357	610
R-squared	0.71	0.64
F-Statistic	168.52	218.15
Prob. (F-Statistic)	0.0000	0.0000

The numbers in the brackets are absolute value of t-statistics. ** indicates significance at 1% level of significance. * indicates significance at 5% level of significance.

Figure 1: Threshold Tests



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