Ethnic Fractionalization in the Growth and Development of Sub-Saharan Africa

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Abstract

This study examines the relationship between ethnic fractionalization and human development in developing nations, specifically sub-Saharan Africa. It differs from previous studies on ethnic fractionalization in that it focuses on human development rather than solely on economic development. In conjunction with the argument that sub-Saharan Africa's increased ethnic fractionalization drastically decreases human development, I hypothesize that an inverse relationship exists between ethnic fractionalization and human development. The primary variables investigated include human development, ethnic fractionalization, spoken languages, and level of economic development. Correlation analysis was used to determine the relationship between each variable and human and economic development in 175 developing nations, and then further broken down by region. Linear regression analysis was used to determine the causal impact of each variable on human and economic development. The results confirm the hypothesized inverse relationship between human development and ethnic fractionalization. The results of the regression with economic development and ethnic fractionalization depict a positive rather than inverse relationship, suggesting that economic development is a universal value among all ethnic groups, not promoting human development.

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The growth and development of African nations has been a concern since the 1950s. At that point in time, expectations for the growth and development of Africa were uncertain due to political transitions occurring after decades of imperialist rule. However, after 1960-1973, all uncertainties were erased as African growth increased rapidly (Collier & Gunning, 1999, p. 3). Self-determination also appeared to be aiding political and economic growth in Africa.

This changed during the early 1970s when African governments transformed into autocracies and dictatorships. Beginning in 1980 and continuing through the 1990s, GDP per capita in sub-Saharan Africa declined about one percent every year and 32 African nations are poorer now than in 1980. Africa's growth and development at the turn of the century was characterized as stagnate and steadily declining (Collier & Gunning, 1999, p. 3). Currently, sub-Saharan Africa is one of the poorest regions of the world (Tecola & Scanlan, 2007, p. 1).

The debate on the causes of slow economic growth and development in Africa has recently returned to the topic of ethnic fractionalization, a term largely synonymous with ethnic diversity. Until recently, it was considered unacceptable to hypothesize that ethnic diversity impacted development negatively because it was a racist assumption (Collier, 1998, p. 17). However, preliminary studies confirmed the validity of this hypothesis, sparking interest in the topic. According to Alesina and La Ferrara (2005, p. 762) ethnic fractionalization can impede growth due to increased conflicts of interests, racism, and prejudices. This leads to counterproductive government policies because the focus is on suppressing certain ethnic groups rather than promoting growth and development.

This study will demonstrate the impact that ethnic fractionalization has on the growth and development of developing nations as modeled after Portes' (1976) three step transformation process that all developing nations must undergo in order to be considered developed. Data was statistically analyzed through correlation and linear regression analysis for the 175 developing nations, listed in Appendix A. It is expected that an inverse relationship will exist among human development and ethnicity, spoken languages, unemployment rate, and military expenditures and a positive relationship between human development and the level of economic development. The expected results should provide developing nations, specifically those in sub-Saharan Africa, with the pertinent information needed to make effective policy changes.

Literature Review

Human Development

One way to measure the amount of growth and development present in a nation is to measure human development. Human development combines both economic growth and improvements in the social welfare of citizens. According to Weiner (1987, p. 35) ethnic fractionalization impedes human development because one dominant ethnic group controls the government and attempts to conform, absorb, suppress, and/or crush all opposing ethnic groups. Subsequently, policies and funding are directed towards these activities instead of towards improving human development.

Tecola and Scanlan (2007, p. 1) focus on the links between ethnic diversity, conflict, and political instability in sub-Saharan Africa. They utilize the Human Development Index (HDI) as

the dependent variable instead of GDP or GNP per capita in order to incorporate both economic growth and improvements in social welfare and found that ethnic diversity negatively affects human development in sub-Saharan Africa. Alesina and La Ferrara (2005, p. 794) further support this conclusion by stating that public good supplies, an aspect of human development, were significantly lower in ethnically diverse nations.

Ethno-Linguistic Fractionalization

Tajfel and Turner's (2004, pp. 59-60) social identity theory states that individuals in society form groups with which to identify, and that these groups are viewed as superior to all others. All positives in society are associated with the group to which they belong, the in-group, while all negatives are associated with group(s) to which they do not belong, the out-group. Since this behavior is prevalent in competing ethnic groups, it impedes the growth and development of ethnically fractionalized nations because compromises can rarely be reached regarding the methods that should be used to increase development and how the positives of development are distributed.

Easterly and Levine (1997, pp. 1206-1207) hypothesize that ethnic fractionalization influences economic growth and public policies. In order to test this hypothesis they utilized the Ethno-Linguistic Fractionalization Index (ELF) to measure ethnic fractionalization. This research showed that high levels of ethnic fractionalization are correlated with high black market premiums, poor financial development, decreased infrastructure, and low levels of education. Moreover, this research also determined that ethnic diversity negatively affected public policies associated with improving economic growth.

Posner (2004, p. 850) focuses on the problems with the ELF Index while proposing and testing the validity of an alternative index, the Politically Relevant Ethnic Groups (PREG). The first identified problem with ELF is that the data is over forty years old and inaccurate because of the evolving demographics of ethnic groups over the course of a few decades. The second issue with ELF is that it is coded incorrectly, which Posner (2004, p. 850) terms "grouping problems." The populations of most ethnic groups are listed separately, but some are combined into one population count leading one to believe that these combined populations are similar ethnically and politically. For example, in Uganda, the Acholi and Lango are combined in ELF even though they have a long history of political rivalry. Perhaps the most distressing example of "grouping problems" is in the case of Rwanda and Burundi. ELF places the Rwandan Hutus and Tutsis into a combined category of "Barundi" (Posner, 2004, p. 851). The third problem with ELF is that most studies use it to claim a link between ethnic diversity and slow growth, while Posner (2004, pp. 852-854) claims this ignores the political relevance of each ethnic group in a nation. Political relevance is crucial to economic growth because there are certain ethnic groups that have no affect on economic growth and policy making; therefore, the assumption is that they do not need to be included in research. The problem is how to know which groups to include and which ones to exclude.

Posner's (2004, pp. 854-859) PREG index contains data for 42 African nations. In order to determine which ethnic groups are politically relevant in a nation, descriptions of party-building efforts, electoral campaigns, and voting patterns were analyzed. Based on the ethnic breakdowns used for ELF, the ethnic groups were retained, eliminated, or combined. The weight of the population denominator was adjusted for each group so that when added, those

deemed as politically relevant ethnic groups would still equal one-hundred percent of the population.

Posner (2004) replicated Easterly and Levine's (1997) study by utilizing PREG. According to Posner (2004, p. 859) results obtained utilizing ELF did not show policies as impacting growth and development in Africa as Easterly and Levine (1997) had found. However, when PREG is substituted, the relationship among ethnic diversity, policies, and growth re-emerges, due to PREG's inclusion of a political relevance category that ELF does not have. While PREG does not solve all issues associated with ELF, it does improve the confidence level of the results in studies testing if ethnic diversity impacts growth and development through government policies. The results of Posner's (2004) replication of Easterly and Levine's (1997) study found that an inverse relationship exists between ethnic fractionalization and economic growth in Africa, supporting the findings from the replicated study. Overall, Posner (2004, p. 861) asserts that findings found using PREG are more solid methodologically and theoretically than those found with ELF.

While the majority of studies find an inverse relationship between ethnic fractionalization and development, Collier, Honohan, and Ove Moene (2001, p. 132) did not. This study also uses the ELF index to test whether fractionalized nations have lower economic performance compared to nations with a dominant ethnic group. This study utilizes the economic growth rate as the dependent variable and tests whether ethnic dominance reduces growth regardless of the type of political system. The results show that ethnic diversity is not a hindrance to economic policy while ethnic dominance was actually found to worsen economic performance regardless of the type of political system.

Control Variables

GDP per Capita

There are three dominant theories attempting to explain the process of development in developing nations. Rostow's (1960, pp. 4-16) modernization theory argues that lesser developed nations (LDCs) are poor and continue to be categorized as developing due to their unwillingness to break from their traditional ways of life. This model affirms that LDCs must adopt the ways of the North in order to become developed. Dependency theory, developed by Frank (2004, pp. 40-41) states that LDCs continue to be developing because of their reliance on industrialized nations. Since industrialized nations continue to exploit LDCs, the only way for the LDCs to become developed is to break all ties with their industrialized trade partners, become self-reliant, and form mutually beneficial trade agreements. Wallerstein's (1974, pp. 229-233) world-systems theory, which focuses on the capitalist aspects of the world economy, analyzes development through three strata that comprise the world economy: the core, the semi-periphery, and the periphery. Development and involvement in the global economy are said to be influenced by a nation's current level of involvement in the global economy and other national forces such as social cleavages, ethnic conflict, and national policies.

An alternative to these theories, neo-classical growth theory, emphasizes the ability to substitute different factors of production such as labor, capital, land, etc., that allow the economy to achieve steady-state growth (Solow, 1987, p. 1). Steady-state growth is the proportionate growth rate of all variables needed for production. Due to the political and economic environment of developing nations, it is more difficult for them to achieve steady-state growth and development.

Alesina and La Ferrara (2005, p. 765) use the social identity theory presented earlier to explain the behavior of ethnic groups and how this impacts economic performance. In the case of economics, members of a particular ethnic group equate economic prosperity with one another while blaming economic recessions on other ethnic groups. This theory also states that ethnic groups prefer only to conduct business with members of the same ethnic group. Therefore, nations with numerous ethnic groups will have a lower GDP per capita than those with a dominant ethnic group because different ethnic groups are relatively less willing to conduct business with one another.

Evidence gathered at the turn of the century supports the belief that ethnically fractionalized nations characteristically have lower economic performance than nations with less ethnic fractionalization because policies and funding are more focused and spent on suppressing inferior ethnic groups. Collier (1998, p. 17) further notes how this is disturbing in Africa because it has the highest level of ethnic fractionalization and the slowest growth compared to all other world regions. Collier and Gunning (1999, p. 6) assert that since Africa has more ethnic diversity than any other region of the world, it is harder to develop an interconnected economy. This study also found that faster economic growth coincided with improved trade relations, agreements, and policies. Montalvo and Reynal-Querol (2004, p. 317) also studied the impact of ethnic diversity on economic development and concluded that ethnic fractionalization has a negative affect on growth.

Collier (1998, p. 17), investigates the impact that ethnic diversity and political climate have on economic performance with political climate categorized as either a democracy or a dictatorship. It is hypothesized that ethnic diversity has no significant impact on democracies.

However, growth in a dictatorship may be affected by the focus on redistribution of goods and services. This study found that ethnic diversity only stunted growth in nations where citizens had limited political rights, in other words, dictatorships stunt growth while democracies promote growth.

Tecola and Scanlan (2007, p. 13) found that cultural diversity alone did not negatively affect GDP per capita as some studies have shown; however, it did negatively impact human development of which economic development is a part. Therefore, this study supports that a positive relationship exists between economic development and human development. Numerous other variables have also been found to impact economic and human development, such as unemployment rate.

Unemployment Rate

According to Weiner (1987 p. 36), when an ethnic hegemon controls the government of an ethnically fractionalized nation, it imposes its authority in numerous ways. One way is through preferential treatment of individuals belonging to the same ethnic group as the hegemon. This preferential treatment takes the form of increased educational and employment opportunities for their group while all other ethnic groups are discriminated against. Since only a small portion of the population is educated and working in lucrative positions, numerous individuals are unemployed and live below the poverty level.

Harris and Todaro (1970, pp. 126-127) assert that mass unemployment leads to losses in economic growth because the unemployed are not stimulating the economy. Therefore, they become a drag on the economy by requiring significant amounts of social welfare benefits that typically are not available in LDCs. Unemployment further negatively impacts HDI ranking

because insufficient economic activity does not provide sufficient funding towards increasing human development.

Military Expenditures

According to Keller, Poutvaara, and Wagener (2006, p. 2) military conscription is associated with low economic growth. They found that the cost of military conscription negatively impacts the growth of GDP per working-aged person in nations belonging to the Organization for Economic Co-operation and Development (OECD).

Looney and Frederiksen (1986, p. 331) examined the impact that defense expenditures and debt have on economic growth and development. Nations were grouped as either resource constrained or unconstrained based on the amount of international credit available to them. The relationship between economic growth and military expenditures was found to be statistically insignificant for the total sample, and for those nations categorized as resource constrained. However, a significant negative relationship was found for the unconstrained group. Looney and Fredericksen (1986, p. 336) explain that this result is due to the amount of investment and funds available to these nations. In essence, nations with an unconstrained amount of investment and funds available have more to spend and are more willing to spend on the military than those that do not.

Identified Model

Development is generally described as the transformational restructuring of agrarian societies to industrialized societies. According to Portes (1976, pp. 55-56) there are three transformations that must take place in order for a society to successfully develop. These transformations are an expansion of modernization theory, encompassing both human and

economic development. First, an *economic transformation* must occur whereby increases in both industrialization and GDP are seen. Second, a *social transformation* must occur where there is less income disparity and more social welfare benefits are available and distributed to the population. Lastly, a *cultural transformation* must occur whereby a national identity is established, which unites the entire population despite any other previous affiliations such as class, ethnicity, etc. This third component will be specifically emphasized in the discussion of the results.

Methods

The model for this study is based on Portes' (1976) three transformations in order to test the impact that ethnic fractionalization, spoken languages, GDP per capita, unemployment rate, and military expenditures have on both human and economic development. Correlation and linear regression analysis were used to determine the direction and significance of relationships among variables. In order to determine whether a social transformation has occurred, human development was chosen as the dependent variable and is measured by the 2005 Human Development Index (HDI). HDI values are based on three dimensions: longevity, knowledge, and growth of per capita income. HDI values range from 0-1 with scores closest to one indicating greater human development.

Ethnic fractionalization was measured as a dummy variable with data drawn from various years of the CIA World Factbook (2008). Nations with one ethnic group consisting of 50.1% of the population or more were coded as 0 and considered to be ethnically dominant nations. Nations that do not have a dominant ethnic group representing over 50.1% of the

population were coded as 1 and considered to be ethnically fractionalized. Most studies seeking to measure ethnic fractionalization utilize the ELF or PREG indices; however, the assignment of a dummy variable in this study yielded similar results (Easterly & Levine, 1997, p. 1206; Posner, 2004, pp. 854-859). As shown in Table 1, the dependent variable measure used in this study was found to be significantly related to the ELF measure while not related to the PREG index. The ELF and PREG indices were also found to be significantly correlated.

Table 1 – Results of Correlational Analysis of Ethnic Fractionalization Indices

		Ethnic Groups	PREG	ELF
Ethnic Groups	Pearson Correlation	1		
	Significance	-		
	Number of Cases	175		
PREG	Pearson Correlation	0.13	1	
	Significance	0.413	-	
	Number of Cases	42	42	
ELF	Pearson Correlation	0.532	0.542	1
	Significance	0.000	0.000	-
	Number of Cases	115	40	115

However, less visible ethnic groups were eliminated from the PREG index formula; thus, leaving only 42 cases (Posner, 2004, pp. 854-855). Subsequently eliminating the relationship to the measure used in this study. Consequently, in an effort to be more parsimonious, the dummy variable measure was used. Thus, it is hypothesized that an inverse relationship exists between ethnic fractionalization and human development.

Since most ethnic groups speak different languages, the number of spoken languages in a nation is a likely indicator of growth and human development because of the lack of communication between ethnic groups. Therefore, languages listed as “living,” i.e., those that have been learned as a first language, in each nation was collected from the Ethnologue

Country Index of Languages of the World (Gordon, 2005).[i] It is hypothesized that an inverse relationship exists between spoken languages and human development.

GDP is one tool used to measure the existing economic development of a nation. In order to control for population, GDP per capita (reported in 2005 U.S. dollars purchasing power parity) was collected from various years of the CIA Factbook (2008). Given that this is one of several component indicators of HDI, a positive relationship is hypothesized to be present between existing economic development and human development.

Since unemployment is typically a drag on an economy, it should also play a role in human development. Unemployment reflects a downturn in the economy and in the resources available to promote human development. Unemployment is measured as a percentage of the total labor force and was collected from various years of the CIA Factbook (2008). An inverse relationship is hypothesized for unemployment rate and human development.

Military expenditures can also be a drain on the economies of LDCs. Given the assumption of a zero sum game, the increase in military expenditures should detract from spending in other areas like healthcare. Therefore, the opportunity cost of pursuing a larger military is at the expense of areas comprising human development. The amount of military expenditures was also collected from various years of the CIA Factbook (2008). This data was calculated on an exchange rate basis to United States dollars for the purpose of comparison. An inverse relationship is hypothesized between military expenditures and human development.

In summary, the following hypotheses will be tested via correlation and regression analysis:

#1: The more ethnic fractionalization, the less human development.
#2: The greater the number of spoken languages, the less human development.

#3: The higher economic development, the more human development.
#4: The higher the unemployment rate, the less human development.
#5: The higher the military expenditures, the less human development.

As was earlier mentioned, many studies have used economic development or human development as their dependent variable measure. To determine the impact of looking purely at economic development or the broader human development measure, the same hypotheses were tested with economic development as the dependent variable.

It is also predicted that ethnic fractionalization will have the largest affect on human development in sub-Saharan Africa when compared to the other regions of the world listed in Appendix A. This is because of the greater homogeneity with respect to ethnic groups lying outside sub-Saharan Africa. Thus, the following hypotheses will also be tested:

#6: The more ethnic fractionalization in Sub-Saharan Africa, the less human development.
#7: The greater the number of languages spoken in sub-Saharan Africa, the less human development.
#8: The higher GDP per capita, the more human development present in sub-Saharan Africa.

Results

The results of the bivariate correlations for the entire set of LDCs and the hypothesized direction of the relationship when human development and economic development are the dependent variables is summarized in tables 2 and 3.

Table 2 – Bivariate Correlations with HDI

Variable	Number	Coefficient	Significance	Expected Direction
Ethnic Groups	150	-0.492	0.000	-
Languages	149	-0.199	0.015	-
GDP per capita	150	0.751	0.000	+
Unemployment	132	-0.017	0.846	-
Military Expenditures	140	0.144	0.089	-

As Table 2 indicates, there is a significant inverse relationship between ethnic fractionalization and human development, thus supporting hypothesis #1. A significant inverse relationship was also found to exist between the number of spoken languages and the level of human development, thus supporting hypothesis #2. A significant positive relationship was found between existing economic development and human development, thus supporting hypothesis #3. Although an inverse relationship was found, the relationship between unemployment and human development was not significant, contradicting hypothesis #4. One possible explanation for this result could be that the unemployment rate is already encompassed in the GDP per capita measure. The results for military expenditures were also insignificant; thus lending no support for hypothesis #5. Moreover, the direction of the relationship was positive rather than the expected negative. This could be the result of nations with greater human development having more disposable income, thus making them more willing to allocate funds towards defense spending.

Table 3 – Bivariate Correlations with Level of Existing Economic Development

Variable	Number	Coefficient	Significance	Expected Direction
Ethnic Groups	175	-0.137	0.07	-
Languages	172	-0.184	0.016	-
HDI	150	0.751	0.000	+
Unemployment	156	-0.49	0.542	-
Military Expenditures	145	0.145	0.082	-

Table 3 shows that ethnic fractionalization was negatively related but marginally insignificant with economic development. The results for the remaining variables followed the exact results reported in Table 2. This comparison of dependent variable measures indicates that they are interchangeable and could both be used as a measure as human development. Since ethnicity was just short of being significant, the interchangeable aspect of GDP per capita

and HDI may depend on whether the ethnicity and spoken language variables are interchangeable.[ii]

The results of the regression model in Table 4 was F (122, 45.931, p = .0001) with an adjusted R square of .648, making this model largely successful at predicting the level of human development. As seen in Table 4, a significant inverse relationship exists between ethnic fractionalization and HDI, thus supporting hypothesis #1. While the number of spoken languages was significantly correlated with HDI, it is not in the regression analysis.[iii] As in the correlation analysis, GDP per capita again was found to have a significant positive relationship with HDI, supporting hypothesis #3. While the direction of the relationship for both unemployment and military expenditures was expected neither were significant predictors of human development.

Table 4 – Results of Linear Regression with Dependent Variable, HDI

Variable	Beta	t score	Significance	Expected Relationship
Ethnic Groups	-0.316	-5.619	0.000	-
Languages	-0.005	-0.094	0.925	-
GDP PPP	0.707	12.318	0.000	+
Unemployment	-0.005	-0.1	0.920	-
Military Expenditures	-0.052	-0.934	0.352	-

Table 5 – Results of Linear Regression with Dependent Variable, Level of Economic Development

Variable	Beta	t score	Significance	Expected Relationship
Ethnic Groups	0.196	3.018	0.003	-
Languages	-0.06	-0.994	0.322	-
HDI	0.799	12.318	0.000	+
Unemployment	-0.016	-0.283	0.778	-
Military Expenditures	0.151	2.597	0.011	-

The results of the regression model in Table 5 was F (122, 37.909, p = .0001) with an adjusted R square of .618, making this model largely successful in predicting the level of economic development. As Table 5 indicates, the expected inverse relationship between ethnic fractionalization and level of economic development was unexpectedly positive and significant. While this is an unexpected result, it might be explained by the argument that all ethnic groups,

no matter how fractionalized the country is, are able to agree on the need for economic development (Esman, 1997, p. 530). An inverse but insignificant relationship was found between the number of languages spoken and the level of economic development.

Table 6 – Bivariate Correlations with HDI

Sub-Saharan Africa

Variable	Number of Cases	Coefficient	Significance	Expected Sign
Ethnic Groups	45	-0.321	0.031	-
Languages	45	-0.219	0.149	-
GDP PPP	45	0.851	0.000	+

South America

Variable	Number of Cases	Coefficient	Significance	Expected Sign
Ethnic Groups	12	-0.587	0.045	-
Languages	12	-0.094	0.771	-
GDP PPP	12	0.941	0.000	+

Central Asia/Europe

Variable	Number of Cases	Coefficient	Significance	Expected Sign
Ethnic Groups	27	-0.012	0.953	-
Languages	27	-0.069	0.733	-
GDP PPP	27	0.942	0.000	+

Asia

Variable	Number of Cases	Coefficient	Significance	Expected Sign
Ethnic Groups	27	-0.313	0.111	-
Languages	26	-0.244	0.229	-
GDP PPP	27	0.791	0.000	+

Latin America/the Caribbean

Variable	Number of Cases	Coefficient	Significance	Expected Sign
Ethnic Groups	21	-0.323	0.153	-
Languages	21	-0.051	0.825	-
GDP PPP	21	0.726	0.000	+

Middle East/North Africa

Variable	Number of Cases	Coefficient	Significance	Expected Sign
Ethnic Groups	18	0.265	0.287	-
Languages	18	-0.184	0.464	-
GDP PPP	18	0.830	0.000	+

As expected, a significant positive relationship exists between level of economic development and human development. An inverse relationship exists between the level of economic

development and unemployment, although insignificant. A significant relationship exists between the level of economic development and military expenditures although the direction of the relationship was unexpectedly positive. Invariably due to circumstances discussed previously.

As shown in Table 6, an inverse relationship was found to exist between ethnic fractionalization and human development in sub-Saharan Africa, thus supporting hypothesis #6. The only other region where ethnic fractionalization was found to be significantly related to human development was in South America; consequently, the sub-Saharan Africa and South America subsets are largely responsible for the significant results. An inverse relationship was found between human development and the number of languages spoken, but was not significant, thus hypothesis #7 was not supported. Finally, a significant positive relationship was found between level of economic development and human development in sub-Saharan Africa lending support to hypothesis #8.

Implications and Summary

This research suggests that nations with high levels of ethnic fractionalization have less human and economic development. The same is also true with respect to the number of languages spoken. This study promotes policy decisions that serve to break down ethnic barriers in order to form unified nations with high degrees of nationalism. Consequently, ethnic ties would become secondary to the newly formed national ties in order to promote both human and economic development. Since the more languages spoken impede growth and development, policymakers should implement a national language as a bridge to promote

communication among diverse ethnic groups and decrease the incidence of ethnic conflict. Moreover, the promotion of a national identity and language fulfills the third step of Portes' (1976) model that cultural transformations are needed to increase human development in LDCs.

Further research needs to be conducted on the relationship between the existing level of economic development and unemployment. It is extremely uncharacteristic for economic development not to be influenced by unemployment since the former is heavily dependent on the amount of work and funds individuals generate. Further research also needs to be conducted on the relationship between unemployment and human development. Although this study did not find a significant relationship, it was speculated that they are heavily dependent on one another because the employed are better off monetarily, stimulate the economy, and require less social welfare benefits.

Ethnic fractionalization was found to have a significant impact on the level of human development in sub-Saharan Africa and South America, but not in other areas with ethnic fractionalization, such as Asia/Pacific and the Caribbean/Latin America. Thus, further research needs to be conducted on which variables present in sub-Saharan Africa and South America are impeding human development that are not present, or as prevalent, in Asia/Pacific and the Caribbean/Latin America.

Other variables that may be of interest in determining the level of human development in a nation include: trade, foreign direct investment (FDI), infrastructure, and foreign debt. Numerous studies have been conducted on the impact that trade has on economic development, for example, Frank (1968, p. 44) and Rostow (1960). Since economic

development is encompassed in human development and according to the first step of Portes' (1976) model calling for the need of an economic transformation in establishing human development, it is worth investigating the impact that additional economic variables may have.

Billet (1991, pp. 22-23) states that the different government policies of developing nations can influence FDI from multi-national corporations (MNCs). FDI is also influenced by domestic characteristics, the socio-economic aspects of a nation. Therefore, it is worth investigating if ethnic fractionalization and the level of human development influence an MNC's decision to invest given its relation to the first step of Portes' (1976) model.

Another variable that should be investigated is the level of infrastructure in LDCs. The second step in Portes' (1976) model requires a social transformation for greater human development to occur. Röller and Waverman (2001, p. 909) found that a more developed telecommunications infrastructure increases development by increasing communication among citizens, businesses, etc. Similarly, transportation infrastructure (e.g. roadways, railways, airports, etc.) should also impact the economic and human development of LDCs based on its relationship to the first step of Portes' (1976) model.

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[i] Information found is obtained from numerous sources and verified by reliable publications and field correspondents.

[ii] The relationship between ethnic fractionalization and spoken languages (0.213) was found to be significant at the 0.005 level; thus supporting that these two variables are also largely interchangeable.

[iii] In the interest of parsimony, languages spoken was removed from the regression model in order to see if this strengthened the relationship of the remaining variables with HDI. The results F (122, 57.898, p = .0001) did not have the intended effect. There was not a significant increase in the adjusted R-square (from 0.648 to 0.651).The significance level stayed the same for both variables. The t score for military expenditures did not change, but the score for ethnicity changed from -5.619 to -5.819. Ultimately, excluding languages from the model did not strengthen any of the relationships, but it did marginally strengthen the model.