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Ethnic Diversity and Poverty

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Abstract:

We examine the relationship between ethnic diversity and poverty for a cross-sectional sample of 60 developing countries. We measure diversity using indices of ethnic and linguistic fractionalization, and measure poverty using the multidimensional poverty index (MPI), multidimensional poverty headcount (MPH), intensity of deprivation, poverty gap and poverty headcount ratio. We find that ethnic and linguistic fractionalization contributes to poverty levels. Specifically, we find that a standard deviation increase in ethnic fractionalization is associated with a 0.37, 0.83 and 0.77 standard deviation increase in the MPI, MPH and the intensity of deprivation, respectively. Moreover, a standard deviation increase in ethnic fractionalization is associated with between a 0.30 and 0.56 standard deviation increase in the population living below $1.90 and $3.10, the poverty gap at $1.90 and $3.10 a day and the headcount ratio at $1.90 and $3.10 a day. Similar results are also observed for linguistic fractionalization with standardized coefficients ranging between 0.31 and 0.91. We find that our results are robust to alternative ways to measure fractionalization and poverty as well as alternative approaches to address endogeneity.

Key words: Ethnic diversity; poverty; fractionalization.

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1. Introduction

Addressing poverty is one of the most pressing issues confronting developing countries. The importance of addressing poverty is reflected in the fact that the first objective of the Millennium Development Goals was to eradicate extreme poverty and hunger. The Millennium Development Goals' target of halving the proportion of people whose income is less than $1 a day (increased to $1.90 per day) between 1990 and 2015 was realized five years ahead of time.[2] About 700 million fewer people lived in extreme poverty in 2010 compared with 1990. Yet, despite this impressive achievement, 1.2 billion people continue to live in extreme poverty (United Nations, 2013).

A first step to addressing poverty is improved understanding of its root causes. Given the ongoing importance of addressing poverty, many studies have focused on how, and why, economic factors affect poverty (see, e.g., Adams, 2004; Beck et al., 2005; Dollar & Kraay, 2004; Fan et al., 2000; Ravallion, 1995; Zhuang et al., 2010). Sitting alongside this literature, there is a growing interest within economics in understanding the role of broader socio-cultural factors such as colonial history, disease, geographic locale and institutional factors in contributing to income distribution and poverty (see e.g., Acemoglu et al., 2001, 2002; Acemoglu & Johnson, 2005; Ashraf & Galor, 2013). Ethnic heterogeneity is an important socio-cultural factor that has been shown to be correlated with a range of policy variables, such as quality of government and indices of development (see e.g., Alesina et al., 1999, 2003; Alesina & Zhuravskaya, 2011; Easterly & Levine, 1997). Yet, despite the growing interest in the relationship between socio-cultural factors and poverty, we know virtually nothing about the relationship between ethnic heterogeneity and poverty levels.

We seek to answer the question: Does ethnic diversity contribute to higher poverty levels? To answer our research question, we examine the direct effects of fractionalization on a wide range of poverty

[2] The international poverty line was set at $1 a day at the time that the Millennium Development Goals were established. In 2008 it was increased to $1.25 and since October 2015, the World Bank has defined people living in extreme poverty as those living on less than $1.90 per day, reflecting rising costs in developing countries.

indicators in a cross-section of 60 developing countries. Our main measures of ethnic and linguistic diversity are drawn from Alesina and Zhuravskaya (2011), who provide indices of ethnic and linguistic fractionalization at the regional (sub-national) and national levels. The index of fractionalization captures the probability that two randomly selected individuals in a country/region belong to different ethnic/linguistic groups. Specifically, we focus on the effects of fractionalization on the multidimensional poverty index (MPI), multidimensional poverty headcount (MPH), intensity of poverty, poverty gap and poverty headcount ratio. We find that, on average, ethnic and linguistic diversity contributes to poverty levels. Specifically, after controlling for endogeneity, we find that a standard deviation increase in ethnic fractionalization is associated with an increase of 0.37, 0.83, and 0.77 standard deviations in the MPI, MPH and the intensity of deprivation respectively. Results further show that a standard deviation increase in ethnic fractionalization is associated with an increase of 0.56 standard deviations in the population living below $1.90 and $3.10; 0.30 and 0.34 standard deviations in the poverty gap at $1.90 and $3.10 a day, respectively; and 0.40 and 0.42 standard deviations in the headcount ratio at $1.90 and $3.10 a day, respectively. We obtain similar results for linguistic fractionalization. Our findings prove robust if we use the 2010 United Nation Development Programme (UNDP) poverty indices instead of the revised measures used in the main results; if we substitute the Alesina et al. (2003) fractionalization indices for those proposed by Alesina and Zhuravskaya (2011) and to alternative ways to tackle endogeneity.

We contribute to the literature by providing the first study to examine the relationship between fractionalization and poverty levels across several countries. Specifically, we document the effect of ethnic diversity on a wide range of poverty indicators. Understanding this relationship is important, as it adds to the literature that seeks to understand the causes of poverty and how to address it. The findings are important because they suggest that in addition to economic factors such as economic growth and institutional quality, among others, socio-political factors such as ethnic diversity have an important role in explaining differences in poverty levels across countries.

This finding has important policy implications. In an attempt to alleviate poverty, the World Bank and the International Monetary Fund have encouraged countries to implement economic policy reforms such as privatization as well as price and trade liberalization, among others. The findings from this study suggest that, alongside these economic factors, attention should be given to ethnic diversity, which has not been a primary consideration in policies to reduce poverty. As Miguel (2006, p. 169) puts it: "The bottom line is that good economic policies alone may be insufficient to reduce poverty in countries with deep social divisions". In addition to the usual prescription of good economic policies, "nation building" policies that foster the development of a common national identity might be needed to reduce the effect of fractionalization on poverty (Miguel, 2006).

The remainder of the paper is organized as follows. The next section discusses the conceptual relationship between ethnic diversity and poverty. Section 3 reviews the related literature. Sections 4 and 5 discuss the data and empirical methods. Section 6 presents, and discusses, the results. Section 6 examines the robustness of our results while Section 7 concludes.

2. The conceptual relationship between ethnic diversity and poverty

Conceptually, ethnic diversity could be positively or negatively related with poverty levels. There are several potential explanations consistent with a positive relationship between ethnic diversity and poverty. Becker (1957) provides a theoretical framework that explains the association between ethnic prejudice and discrimination. Becker (1957) argues that firms which discriminate could be forced out of business by non-discriminating firms, which are more open-minded. Business closure, in turn, may be associated with loss of income and unemployment, which, in turn, increases the prevalence of poverty incidence. Specifically, ethnic and linguistic fragmentation may result in labour market discrimination and occupational segregation, which contributes directly to loss of income and, hence, higher levels of poverty (Gradín et al., 2010; Sawhill, 1976).

Ethnic fragmentation is associated with slower economic growth and poorer public policy performance, including poor schooling outcomes, slower financial development, less physical infrastructure investment and greater foreign exchange rate distortion (Easterly and Levine, 1997), all of which can be expected to contribute to poverty or impede attempts to combat poverty. Similarly, ethnic diversity is associated with poorer governance and institutional quality (Alesina & Zhuravskaya, 2011). With poorer institutions, the prevalence of poverty is higher (Chong & Calderón, 2000; Perera & Lee, 2013). Existing research also shows that ethnic diversity negatively influences the provision of public goods (see, e.g., Alesina et al., 1999; Miguel & Gugerty, 2005). The mechanism is that different ethnic groups often cannot agree on the appropriate types of public goods provision, resulting in less funding for public goods overall (see Miguel, 2006). Inadequate public goods could increase inequality, which, in turn, contributes to higher poverty.

Moreover, ethnic diversity is characterized by an inherent hierarchical system, which labels some groups (i.e., ethnic minorities) as inferior to other groups (Awaworyi Churchill et al., 2015). Such labels further promote both social and economic inequality, contributing to higher poverty.

A large body of literature suggests that ethnic diversity is negatively related to social capital, especially trust and social networks (Alesina & Zhuravskaya, 2011; Dincer, 2011; Leigh, 2006; Sturgis et al., 2011). Social networks have significant implications for promoting collective action and poverty reduction. One possibility is that different ethnic groups do not like mixing across ethnic lines, resulting in weaker collective action, including collective action on poverty reduction (Miguel, 2006). Yet another possible explanation is that community social sanctions stimulate collective action, but such sanctions are weaker in more ethnically diverse communities, in which social interaction between different ethnic groups is less common (Miguel & Gugerty, 2005).

In other to save costs and mitigate issues of asymmetric information and adverse selection, microfinance loans are often administered through group lending schemes (Stiglitz, 1990; Stiglitz & Weiss, 1990). Karlan (2005) suggests that cultural similarity draws group members to each other.

Given the socioeconomic status of the poor, formal collateral is often not practical, and thus credit allocation to the poor is premised on trust (Fafchamps, 1996). Trust is eroded in fractionalized communities. Thus, with lower levels of trust in fractionalized societies, financial exclusion occurs because potential borrowers are not able to build potential networks that facilitate borrowing. The inability of the poor to receive credit contributes to higher levels of poverty.

Similarly, trust is a major factor that promotes networking and provides various labour market opportunities (Fafchamps, 1998). Existing literature shows that with imperfect information, social networks can provide economic advantages to agents that are better connected (Fafchamps, 1998; Kranton, 1996). In this regard, when privileged information about opportunities exist, this information circulates more effectively among social networks. Given that social networks depend on trust, and trust is lower in more fractionalized societies, there are likely to be fewer labour market opportunities gleaned through word of mouth, which contributes to higher poverty.

However, ethnic diversity need not always lead to poorer economic outcomes. Ethnic diversity could lead to higher levels of innovation. For instance, Fafchamps (2000) argues that ethnic diversity could increase the talent pool and, therefore, increase the quality of local entrepreneurs. If this occurs, ethnic diversity could increase individual income, and, thus, one might expect poverty reducing effects of ethnic heterogeneity. On the other hand, ethnic diversity is associated with higher income and social inequality (Dincer & Lambert, 2012; Milanovic, 2003), which, it has been argued, exacerbates the incidence of poverty (see, e.g., Janvry & Sadoulet, 2000; Ravallion, 2001).

Theories of entrepreneurship linking ethnicity to entrepreneurship are also relevant to the link between ethnic diversity and poverty. The theory of ethnic enclaves suggest that co-ethnics tend to reside in geographically concentrated locales and be associated with specific economic activities for which they become well known (Wilson & Portes, 1980). As a result different ethnic groups come to dominate specific businesses and trades. In Africa, for example, one thinks of the Ewes and Fantes, who are associated with fishing in the Volta and Central Regions of Ghana respectively, the Luos in

Kenya who dominate the fish trade and Kenyan-Asians who dominate the textile manufacturing industry. Each of these ethnic groups, and others in different locales, possess different cultural values that can influence productivity (Hofstede, 1984; Sowell, 1981). Specifically, ethnic groups are endowed with different cultural values as well as social institutions, and this can foster entrepreneurial talent and innovation at various levels (Ibrahim & Galt, 2011; Wilson & Portes, 1980).

The link between entrepreneurship and ethnic diversity can, therefore, generate either poverty-reducing or poverty-exacerbating effects. When individuals are tied to specific occupations because of their ethnicity, and they fail to work with individuals from other ethnic groups, ethnic diversity may exacerbate issues of poverty, especially where economic activities in which they are engaged are not productive. On the other hand, if individuals from various ethnic groups agree to work together, this has the potential to enhance productivity as entrepreneurial talent from various ethnic groups are harnessed. The resulting innovation and productivity from potential cooperation can generate poverty-reducing effects as well as increased income linked to higher productivity.

3. Related literature

The literature on the determinants of poverty is vast. In this section, we do not attempt to provide a comprehensive review of this literature, but rather highlight some of the main findings. Economic development is considered to be the single most important factor that influences poverty. Several studies provide evidence in favour of the poverty-reducing effects of economic development (see, e.g., Datt & Ravallion, 1992; Dollar & Kraay, 2002; Ghura et al., 2002; Ravallion, 1995, 2001; Roemer & Gugerty, 1997; White & Anderson, 2001). While one strand of the literature argues that, on average, growth is matched proportionately to poverty reduction, there is some evidence that challenges this view, suggesting that the income of the poorest increases less than proportionately with economic growth (see, e.g., Ghura et al., 2002; Roemer & Gugerty, 1997).

Contrary to the conventional wisdom that economic growth reduces poverty, it has been argued that high economic growth contributes to higher levels of inequality, which may exacerbate poverty. In some instances, economic growth in Russia, Eastern Europe and Sub-Saharan Africa has been accompanied by increases in poverty levels or no visible decrease in poverty levels (Akoum, 2008; McKay & Sumner, 2008). Various factors including inequality, the composition of government expenditure, the distributional patterns of growth and labour market dynamics influence the direction and magnitude of the effect of economic growth on poverty (Klasen et al. 2007).

Other studies have also explored the impact of a range of factors on poverty, including geographical characteristics, such as land ownership concentration (see, e.g., Bourguignon & Morrisson, 1990; Deininger & Squire, 1998); education (see, e.g., Tarabini, 2010); macroeconomic conditions (see, e.g., Agénor, 2005; Ames et al., 2001; Azis, 2008); aid and public investment (see, e.g., Agénor et al., 2008); (un)employment and wages (see, e.g., Agénor, 2005); trade liberalization (see, e.g., Epaulard, 2003) and institutions (see, e.g., Aidt et al., 2008; Collier & Dollar, 2001; Tebaldi & Mohan, 2010).

The study of ethnic diversity and its effects has a long history in the sociology and economics literature. In economics, beginning with Easterly and Levine (1997), studies have examined the effects of ethnic diversity, measured by various indices of ethnolinguistic fractionalization, on outcomes such as economic performance, institutional and governance quality, among others (see, e.g., Alesina et al., 2003; Alesina & Zhuravskaya, 2011; Easterly & Levine, 1997). In general, economists have found ethnic diversity to be negatively related with economic outcomes.

The only study, of which we are aware, that considers the relationship between ethnic diversity and poverty is Miguel (2006) who compares the effect of ethnic diversity on poverty reduction across two districts in Kenya and Tanzania. Our study differs from Miguel (2006) in important respects. The first is the scope of the two studies. While Miguel (2006) focuses on two districts in two countries, we examine the relationship between ethnic diversity and poverty across 60 countries. Second, Miguel (2006) primarily focuses on the effect of ethnic diversity on collective action and draws implications

from the findings for poverty reduction.[3] We, on the other hand, directly examine the relationship between ethnic diversity and poverty and use a number of alternative measures of fractionalization and poverty to ensure that our results are robust to alternative definitions.

To summarize, there are myriad studies examining the determinants of poverty and a growing number of studies examining the effect of ethnic diversity on a range of socioeconomic outcomes. There are, however, no comprehensive studies examining the link between ethnic diversity and poverty. This is an existing gap in the literature that we address in this study.

4. Data

Poverty related measures are from the World Bank and United Nation Development Programme (UNDP) databases. Data on macroeconomic control variables are also collected from the World Bank database, while indices of fractionalization are drawn from Alesina and Zhuravskaya (2011).

Our outcome variables capture various dimensions of poverty. We use indices and measures of poverty developed by the UNDP. Specifically, our main measures of poverty drawn from the UNDP include the multidimensional poverty index (MPI), multidimensional poverty headcount (MPH) and intensity of deprivation. The MPI captures the percentage of the population that is multidimensionally poor adjusted by the intensity of the deprivation. The MPH captures the population with a weighted deprivation score of at least 33 per cent, while intensity of deprivation captures the average percentage of deprivation experienced by people in multidimensional poverty.[4] The UNDP indices were first published in 2010, and revised based on critical reviews of the indices conducted during two UNDP conferences held in February 2012 and March 2013. The 2015 Human Development Report

[3] Miguel's (2006) main finding is that ethnic diversity is negatively related with local collective action (and by extension poverty reduction) in the Kenyan district, but not the Tanzanian district. He explains this finding on the basis that ethnic diversity is more important in local public life in Kenya.

[4] For details on index construction process and detailed definitions, see UNDP technical notes at http://hdr.undp.org/en/composite/MPI

(HDR) provides these revised indices. We adopt revised measures for our analysis, and supplement these measures with the 2010 indices in robustness checks.

For robustness, we use various measures of poverty taken from the World Bank database. Specifically, we use the population living below $1.90 and $3.10 a day, poverty headcount ratio at $1.90 and $3.10 a day and poverty gap at $1.90 and $3.10 a day. The population living below $1.90 and $3.10 a day captures the number of people living on less than $1.90 and $3.10 a day, respectively. The poverty headcount ratio at $1.90 ($3.10) a day is the percentage of the population living on less than $1.90 ($3.10) a day. Lastly, the poverty gap at $1.90 ($3.10) a day is the mean shortfall in income or consumption from the poverty line (either $1.90 or $3.10) a day expressed as a percentage of the poverty line. This measure reflects the depth of poverty as well as its incidence. Consistent with existing literature, we the take the decadal average of poverty measures from 1990 to 2009 (see, e.g., Alesina & Zhuravskaya, 2011; Easterly & Levine, 1997).

Alesina and Zhuravskaya (2011) construct indices of ethnic and linguistic fractionalization for a cross-section of countries using the Herfindahl index[5]. These indices capture the probability that two randomly selected individuals in a country belong to different groups (ethnic or linguistic). The indices pool together census information for a cross-section of countries. Given that the census for each country is observed at different points in time, the indices of ethnic and linguistic fractionalization for each country are not for the same years. However, this does not pose a problem as ethnic and linguistic composition, on which indices of fractionalization are constructed, are considered relatively stable over a 30 year time horizon (Alesina et al., 2003).[6]

[5] The Herfindhal index suggests that where s_{ej} is the share of ethnic group e in country j, $FRACTIONALIZATION_J = 1 - \sum_{e=1}^{N} S_{ej}^2$

[6] For more details about the index construction process see Alesina and Zhuravskaya (2011).

For regressions with the highest number of observations, our merged dataset covers 60 developing countries. Table 1 presents summary statistics and a description of variables used in our regressions. Table A1 in the appendix presents a list of countries included in the analysis.

5. Empirical specification

Our primary goal is to establish whether fractionalization is associated with poverty, conditional on relevant covariates. To do this, we adopt a cross-section framework consistent with the existing literature (see, e.g., Alesina et al., 2003; Alesina & Zhuravskaya, 2011; Awaworyi Churchill et al., 2015; Easterly & Levine, 1997). Thus, we run regressions of the following form:

$$POVERTY_i = \alpha + \beta F_i + \sigma' \boldsymbol{X}_i + \varepsilon_i$$

Here, i denotes countries, $POVERTY$ stands for measures of poverty; F represents indices of ethnic and linguistic fractionalization and $\boldsymbol{X}$ is a vector of country level covariates that could potentially affect our outcome variables. Finally, ε is the heteroskedastic error term.

Consistent with existing literature, our control variables include income, economic growth, unemployment rate, literacy rate, income inequality, urbanization rate and institutional quality. Our measure of income is GDP per capita while our measure of economic growth is growth rate of GDP per capita. We use the GINI index as a measure of inequality and urban population to capture the rate of urbanization. Our measure of institutional quality is consistent with Easterly (2007) who uses the average of the size indicators of institutional quality reported in the World Bank's World Governance Indicators (WGI) databases. These indicators include government effectiveness, control of corruption, political stability, voice and accountability, rule of law and regulatory quality.

The use of ordinary least square (OLS) is not appropriate, if there are potential endogeneity issues. In our case, endogeneity may emerge as a result of omitted variables or unobservable factors that cannot

be controlled or accounted for. There are countless possible variables that are unobservable, and are correlated with both our fractionalization and poverty measures.

To ensure that our results are robust to potential endogeneity issues, we adopt a two-stage least squares (2SLS) approach. Our choice of external instrument is informed by Michalopoulos (2012), who proposes suitable instruments for ethnolinguistic diversity. According to Michalopoulos (2012), exogenous variables, such as variations in land quality and elevation, largely inform the formation of ethnolinguistic diversity around the globe. He argues that a single ethnic and linguistic identity is more likely to emerge with homogenous land quality and elevation, whereas heterogeneous geographic conditions may result in more ethnic and linguistic diversity. Michalopoulos (2012) suggests that groups tend to form single ethnic identities along homogenous land endowments in order to enforce property rights, and that these groups defend such endowments against intruders. As a result, it is argued that groups that are more ethnically, and linguistically, similar are predisposed to settle around locales with diverse land endowments. He also suggests that geographic differences increase isolation between groups and can lead to a process of cultural drift, which promotes the formation of distinct linguistic and cultural traits (Boyd & Richerson, 1988).

Furthermore, Michalopoulos (2012) argues that that geographic distance tends to increase migration costs, given that the physical distance between a pair of geographic areas decreases linguistic similarity. Additionally, heterogeneous geography encourages groups to accumulate skills specific to their local environment and, in locations where production decisions are based on natural resources, such as land, people working on different types of land tend to acquire location-specific skills which are not easily transferable to other natural environments. In the end, distinct cultural traits emerge, given that geographic diversity reduces the mobility of people in a given area and increases isolation.

Insights provided by studies such as Ahlerup and Olsson (2012) suggest that a country's distance from the equator (latitude), is another exogenous variable which is negatively correlated with

ethnolinguistic diversity. Ahlerup and Olsson (2012) suggest that species richness or diversity[7] emerges as a result of isolation and adaption. They indicate that species richness increases with proximity to the equator, and variations in human skin colour comes partly from differences in UV radiation which are affected by latitude, altitude and humidity. Given that races are often distinguished by skin colour, ethnic diversity is often linked with latitude.

Consistent with the existing literature, we proceed to instrument our indices of fractionalization with variations in land quality, elevation and latitude.[8] We submit that the exclusion restriction for using these instruments also holds as the main channel through which these exogenous geographic variables can affect poverty is ethnic fractionalization. The results of the instrumental variable (IV) diagnostic tests reported in Tables 3A and 3B also support the validity of these instruments.

6. Results

Figures A1 to A9 in the appendix provide suggestive evidence of the relationship between ethnic fractionalization and our measures of poverty. The scatter plots suggest a positive association between ethnic fractionalization and poverty. Figures A10 to A18 show the relationship between linguistic fractionalization and poverty. These figures also suggest a positive association between linguistic fractionalization and poverty. Although these graphs provide useful suggestive evidence, it is important to control for relevant covariates, which allow us to isolate the effects of fractionalization on poverty. Thus, we run regressions controlling for relevant covariates.

[7] Species richness refers to the number of different species represented in an ecological community, region or landscape.

[8] Studies such as Wang and Steiner (2015) and Awaworyi Churchill et al. (2015) have used variation in land quality, elevation and latitude as instrument for ethnolinguistic diversity. Data on land quality was assembled by Ramankutty et al. (2002) and adopted for use by Michalopoulos (2012). For our analysis, data on latitude, variation in land quality and elevation are taken directly from Michalopoulos (2012). See Michalopoulos (2012) for a detailed description of dataset and how they are constructed. Details on the exogeneity of geographical variable and how they correlate with ethnolinguistic diversity can also be found in Michalopoulos (2012) and Wang and Steiner (2015).

Table 2A presents OLS results for the association between ethnic fractionalization and our poverty measures. Table 2B presents the equivalent results for linguistic fractionalization. We find that our indices of fractionalization are positively associated with several measures of poverty. Specifically, we find that a standard deviation increase in ethnic fractionalization is associated with a 0.12 standard deviation increase in the MPI; 0.20 standard deviation increase in the MPH; and 0.26 standard deviation increase in the intensity of deprivation. We find that a standard deviation increase in ethnic diversity is associated with an increase of 0.31 standard deviations in the population living below $1.90 and $3.10 a day. Similarly, a standard deviation increase in ethnic diversity is associated with an increase of 0.15 standard deviations in the poverty headcount ratio for the population living on less than $3.10 a day, but there is no significant association with the headcount ratio at $1.90 a day. We find no significant relationship between ethnic diversity and the poverty gap at $1.90 a day, but find that a standard deviation increase in ethnic fractionalization is associated with a 0.14 standard deviation increase in the poverty gap at $3.10 a day.

Turning to the relationship between linguistic fractionalization and poverty, we find that a standard deviation increase in linguistic fractionalization is associated with a 0.15 standard deviation increase in the MPI; 0.19 standard deviation increase in the MPH, and 0.22 standard deviation increase in the intensity of deprivation. There is however no statistically significant association between linguistic fractionalization and the other measures of poverty.

Overall, the OLS results suggest that ethnic fractionalization and, to a lesser extent, linguistic fractionalization are positively associated with poverty. However, the OLS results are biased. The 2SLS results are reported in Tables 3A and 3B for ethnic and linguistic fractionalization, respectively. With regard to the effect of both measures of fractionalization, we find that endogeneity causes a considerable downward bias in OLS estimates. When using 2SLS, the resulting estimates for the effects of fractionalization are considerably higher than those using OLS and, in some cases, statistically insignificant coefficients become significant in the 2SLS regressions. Specifically, a standard deviation

increase in ethnic fractionalization is associated with an increase of 0.37, 0.83 and 0.77 standard deviations in MPI, MPH and the intensity of deprivation, respectively. Similar trends are observed for other measures of poverty as well. The significance levels of our results have also improved considerably after addressing endogeneity. For instance, the effect of fractionalization on our poverty headcount ratios and poverty gap at $3.10 were significant at the 10% level using OLS, however, these are significant at the 1% level in the 2SLS regressions.

For linguistic fractionalization, the downward bias associated with OLS is relatively more substantial compared with what we observe in the case of ethnic fractionalization. We find a positive association between linguistic fractionalization and all measures of poverty. Specifically, we find that a standard deviation increase in linguistic fractionalization is associated with an increase of 0.83 and 0.85 standard deviations in the population living below $1.90 and $3.10, respectively. We also find that a standard deviation increase in linguistic fractionalization is associated with an increase of 0.44 and 0.48 standard deviations in the poverty headcount ratio for the population living on less than $1.90 and $3.10 a day, respectively. With regards to the poverty gap as a measure of poverty, a standard deviation increase in linguistic fractionalization is associated with a 0.31 and 0.38 standard deviation increase in the poverty gap at $1.90 and $3.10 a day, respectively.

The effects of fractionalization are relatively stronger compared to the control variables in most specifications. For instance, consider the effect of the literacy rate and inequality on MPH in our 2SLS specification. Our results suggest that a standard deviation increase in the literacy rate and inequality is associated with a decline of 0.26 standard deviations and an increase of 0.42 standard deviations, respectively, in the level of poverty measured by MPH. However, in the same model, the standardized coefficient on ethnic fractionalization is 0.83. These findings are consistent across most specification types. Thus, we find that the effects of both ethnic and linguistic fractionalization on poverty are economically meaningful, and, as such, have practical relevance.

7. Robustness and Sensitivity Checks

In Table 4A we examine if our results are robust to using the initial poverty indices introduced by the UNDP in 2010. Specifically, we use the 2010 MPI and MPH, as well as the population in multidimensional poverty. The findings using these measures are consistent with our main 2SLS results. We find that a standard deviation increase in ethnic fractionalization is associated with an increase of 0.37 standard deviations in MPI, 0.89 standard deviations in MPH and 0.68 standard deviations in the population in multidimensional poverty. Similarly, for linguistic diversity, a standard deviation increase is associated with an increase of 0.33 standard deviations in MPI, 0.78 standard deviations in MPH and 0.90 standard deviations in the population in multidimensional poverty.

Table 4B reports results using the alternative indices of fractionalization proposed by Alesina et al. (2003). In contrast to Alesina and Zhuravskaya (2011), who first collect information at the sub-national level and then aggregate this into national level indices, Alesina et al. (2003) construct their indices directly from national level census observations. Overall, we find that the effects of fractionalization on poverty are robust to this alternative measure of fractionalization.

Table 5 reports results for the effects of fractionalization on poverty using propensity score matching (PSM). PSM can be used to determine the average effect of the treatment (in our case population in less fractionalized countries) on our outcome variables (poverty). PSM mitigates potential endogeneity and allows us to draw a causal inference about the effect of ethnic diversity on poverty with non-experimental data (see, e.g., Cheng et al., 2015; Dehejia and Wahba, 2002). In our study, the treatment is the population in less fractionalized countries given that the OLS results indicate higher levels of poverty for populations in more fractionalized areas.[9] In order to draw causal inferences about the effect of ethnic diversity on poverty using PSM, we ask the question: What is the outcome (in terms of poverty) for a population j that is treated (i.e., lives in a less fractionalized country) relative

[9] We consider countries with indices of fractionalization below 0.5 as less fractionalized and those above 0.5 as highly fractionalized.

to the hypothetical outcome that would have prevailed if the same population lived in a heterogeneous country? We estimate the average treatment effect as follows:

$$\begin{aligned}\tau &\equiv E\{O_1 - O_0|B = 1\} \\ &= E\{E\{O_1 - O_0|B = 1, p(W)\}\} \\ &= E\{E\{O_1|B = 1, p(W) - E\{O_0|B = 0, p(W)\}|B = 1\}\end{aligned}$$

Where τ is the average effect of the treatment, B is a dichotomous variable equal to one for a less fractionalized country and zero otherwise, O represents poverty outcomes such as MPI, MPH and intensity of deprivation, among others and$W$ is a vector of pre-treatment characteristics represented by the covariates in our models. The propensity score, $p(W)$, is the probability of being poorer given pre-treatment characteristics (W). Coding countries with fractionalization scores below 0.5 as homogenous, we find that, on average, poverty indices are lower in homogenous countries than heterogeneous countries. This finding is robust across all measures of poverty in the case of ethnic fractionalization, but not across all poverty measures for linguistic fractionalization. Thus, overall, to a large extent, the PSM results suggest that ethnic fractionalization and, to a lesser extent, linguistic fractionalization increases the incidence of poverty, consistent with our main results.

8. Summary and Conclusions

This study has sought to answer the question. Can cross-country differences in ethnic and linguistic diversity explain cross-country differences in poverty levels? Based on data collected for 60 developing countries, we answer this question using different measures of poverty and indices of ethnic and linguistic fractionalization constructed by Alesina and Zhuravskaya (2011). Based on our preferred 2SLS estimates, we find detrimental effects of ethnic and linguistic fractionalization on several measures of poverty. To examine the sensitivity of our results, we adopt an alternate measure of

fractionalization, use the initial poverty indices introduced by the UNDP in 2010 and employ PSM as an alternate for addressing endogeneity and find that the results are robust.

Our results suggest the need for policies that can mitigate the negative effects of fractionalization. For instance, interaction among leaders of distinct ethnic groups, it is argued, can facilitate intergroup cooperative norms and thus promote social capital (Miguel, 2006). Studies such as Sherif (1958) show that superordinate goals can be used to reduce tensions and promote trust among heterogeneous groups. In highly fractionalized locales, policies can be formulated along these dimensions to promote stronger social capital and reduce the negative consequences of discrimination. Varshney (2003) discusses the Bhiwandi community in India, where the creation of intergroup committees successfully averted violence. Miguel (2006) shows that in the case of Tanzania, nation building in education and language has been successful in reducing the negative effects of ethnic fractionalization, although, as he recognizes, there may be legitimate concerns that such policies will erode some indigenous cultures and languages or promote nationalism that fuels warmongering with neighbouring countries. Overall, we believe that understanding the impact of ethnic diversity on poverty can assist policymakers to understand the context within which economic development is enhanced. Our findings suggest that good economic policies alone are not necessarily sufficient to reduce poverty and promote growth. Ethnic diversity plays a significant role, and therefore needs to be considered when formulating policies to reduce poverty

References

Acemoglu, D., Johnson, S., 2005. Unbundling institutions. *Journal of Political Economy,* 115, 949-995.

Acemoglu, D., Johnson, S., Robinson, J.A., 2001. The colonial origins of comparative development: an empirical investigation. *American Economic Review,* 91, 1369-1401.

Acemoglu, D., Johnson, S., Robinson, J.A., 2002. Reversal of fortunes: Geography and institutions in the making of the modern world income distribution. *Quarterly Journal of Economics,* 117, 1231-1294.

Adams Jr, R. H. (2004). Economic Growth, Inequality and Poverty: Estimating the Growth Elasticity of Poverty. *World Development, 32*(12), 1989-2014.

Agénor, P.-R. (2005). The macroeconomics of poverty reduction. *The Manchester School, 73*(4), 369-434.

Agénor, P.-R., Bayraktar, N., & El Aynaoui, K. (2008). Roads out of poverty? Assessing the links between aid, public investment, growth, and poverty reduction. *Journal of Development Economics, 86*(2), 277-295.

Ahlerup, P., & Olsson, O. (2012). The roots of ethnic diversity. *Journal of Economic Growth, 17*(2), 71-102.

Aidt, T., Dutta, J., & Sena, V. (2008). Governance regimes, corruption and growth: Theory and evidence. *Journal of Comparative Economics, 36*(2), 195-220.

Akoum, I. F. (2008). Globalization, growth, and poverty: the missing link. *International Journal of Social Economics, 35*(4), 226-238.

Alesina, A., Baqir, R., & Easterly, W. (1999). Public Goods and Ethnic Divisions. *The Quarterly Journal of Economics, 114*(4), 1243-1284. doi: 10.1162/003355399556269

Alesina, A., Devleeschauwer, A., Easterly, W., Kurlat, S., & Wacziarg, R. (2003). Fractionalization. *Journal of Economic Growth, 8*(2), 155-194.

Alesina, A., & Zhuravskaya, E. (2011). Segregation and the Quality of Government in a Cross Section of Countries. *The American Economic Review, 101*(5), 1872-1911. doi: 10.2307/23045625

Ames, B., Brown, W., Devarajan, S., & Izquierdo, A. (2001). Macroeconomic policy and poverty reduction: International Monetary Fund Washington, DC.

Ashraf, Quamrul, and Oded Galor. 2013. "The 'Out of Africa' Hypothesis, Human Genetic Diversity, and Comparative Economic Development." *American Economic Review*, 103(1): 1-46.

Awaworyi Churchill, S., Okai, D., & Posso, A. (2015). Internet Use and Ethnic Heterogeneity in a Cross-Section of Countries. *Economic Papers: A journal of applied economics and policy*, n/a-n/a. doi: 10.1111/1759-3441.12125

Awaworyi, S. (2014). The Impact of Microfinance Interventions: A Meta-analysis. *Monash University Department of Economics Working Paper Series, 03-14*.

Azis, I. (2008). Macroeconomic policy and poverty: ADB Institute Discussion Papers.

Beck, T., Demirguc-Kunt, A., & Levine, R. (2005). SMEs, growth, and poverty: cross-country evidence. *Journal of Economic Growth, 10*(3), 199-229.

Becker, G. S. (1957). *The economics of discrimination*: University of Chicago press.

Bourguignon, F., & Morrisson, C. (1990). Income distribution, development and foreign trade: A cross-sectional analysis∗. *European economic review, 34*(6), 1113-1132.

Boyd, R., & Richerson, P. J. (1988). *Culture and the evolutionary process*: University of Chicago Press.

Cheng, Z., Smyth, R., & Guo, F. (2015). The impact of China's new Labour Contract Law on socioeconomic outcomes for migrant and urban workers. *Human relations, 68*(3), 329-352.

Chong, A., & Calderón, C. (2000). Institutional quality and poverty measures in a cross-section of countries. *Economics of Governance, 1*(2), 123-135.

Collier, P., & Dollar, D. (2001). Can the world cut poverty in half? How policy reform and effective aid can meet international development goals. *World Development, 29*(11), 1787-1802.

Datt, G., & Ravallion, M. (1992). Growth and redistribution components of changes in poverty measures: A decomposition with applications to Brazil and India in the 1980s. *Journal of Development Economics, 38*(2), 275-295.

Dehejia, R. H., & Wahba, S. (2002). Propensity score-matching methods for nonexperimental causal studies. *Review of Economics and Statistics, 84*(1), 151-161.

Dehejia, R. H. and Wahba, S. 1999. Causal effects in non-experimental studies: Reevaluating the evaluation of training programs. Journal of the American Statistical Association, 94(448), pp. 1053-1062

Deininger, K., & Squire, L. (1998). New ways of looking at old issues: inequality and growth. *Journal of Development Economics, 57*(2), 259-287.

Dincer, O. C. (2011). Ethnic diversity and trust. *Contemporary Economic Policy, 29*(2), 284-293.

Dincer, O. C., & Lambert, P. J. (2012). Taking care of your own: ethnic and religious heterogeneity and income inequality. *Journal of Economic Studies, 39*(3), 290-313.

Dollar, D., & Kraay, A. (2002). Growth is Good for the Poor. *Journal of Economic Growth, 7*(3), 195-225. doi: 10.1023/A:1020139631000

Dollar, D., & Kraay, A. (2004). Trade, Growth, and Poverty*. *The Economic Journal, 114*(493), F22-F49. doi: 10.1111/j.0013-0133.2004.00186.x

Easterly, W. (2007). Inequality does cause underdevelopment: Insights from a new instrument. *Journal of Development Economics, 84*(2), 755-776.

Easterly, W., & Levine, R. (1997). Africa's Growth Tragedy: Policies and Ethnic Divisions. *The Quarterly Journal of Economics, 112*(4), 1203-1250.

Epaulard, A. (2003). Macroeconomic performance and poverty reduction. *International Monetary Fund, IMF Working Paper No. 03/72*.

Fafchamps, M. (1996). The enforcement of commercial contracts in Ghana. *World Development, 24*(3), 427-448.

Fafchamps, M. (1998). Market emergence, trust and reputation: Stanford University, Stanford.

Fafchamps, M. (2000). Ethnicity and credit in African manufacturing. *Journal of Development Economics, 61*(1), 205-235.

Fan, S., Hazell, P., & Thorat, S. (2000). Government spending, growth and poverty in rural India. *American Journal of Agricultural Economics, 82*(4), 1038-1051.

Ghura, D., Leite, C., & Tsangarides, C. G. (2002). *Is growth enough? Macroeconomic policy and poverty reduction* (Vol. 2): International Monetary Fund.

Gradín, C., del Río, C., & Cantó, O. (2010). Gender Wage Discrimination and Poverty in the EU. *Feminist Economics, 16*(2), 73-109. doi: 10.1080/13545701003731831

Hofstede, G. (1984). *Culture's consequences: International differences in work-related values* (Vol. 5): sage.

Ibrahim, G., & Galt, V. (2011). Explaining ethnic entrepreneurship: an evolutionary economics approach. *International Business Review, 20*(6), 607-613.

Janvry, A. d., & Sadoulet, E. (2000). Growth, Poverty, and Inequality in Latin America: A Causal Analysis. *Review of Income and Wealth, 46*(3), 267-287. doi: 10.1111/j.1475-4991.2000.tb00843.x

Kabeer, N. (2000). Social Exclusion, Poverty and Discrimination Towards an Analytical Framework. *IDS Bulletin, 31*(4), 83-97. doi: 10.1111/j.1759-5436.2000.mp31004009.x

Karlan, D. (2005). *Social Connections and Group Banking*. Economic Growth Center, Yale University, Working Papers.

Klasen, S., Grimm, M., & McKay, A. (2007). *Determinants of pro-poor growth: Analytical issues and findings from country cases*: Houndmills: Palgrave Macmillan.

Kranton, R. E. (1996). Reciprocal Exchange: A Self-Sustaining System. *The American Economic Review, 86*(4), 830-851.

Leigh, A. (2006). Trust, inequality and ethnic heterogeneity. *Economic Record, 82*(258), 268-280.

McKay, A., & Sumner, A. (2008). Economic growth, inequality and poverty reduction: does pro-poor growth matter? : IDS.

Michalopoulos, S. (2012). The origins of ethnolinguistic diversity. *The American Economic Review, 102*(4), 1508.

Miguel, E. (2006). Ethnic diversity and poverty reduction. In R. B. Abhijit Banerjee, and Dilip Mookherjee (Ed.), *Understanding poverty* (pp. 169-184). Oxford: Oxford University Press.

Miguel, E., & Gugerty, M. K. (2005). Ethnic diversity, social sanctions, and public goods in Kenya. *Journal of Public Economics, 89*(11–12), 2325-2368.

Milanovic, B. (2003). Is inequality in Africa really different? *World Bank Policy Research Working Paper*(3169).

Perera, L. D. H., & Lee, G. H. Y. (2013). Have economic growth and institutional quality contributed to poverty and inequality reduction in Asia? *Journal of Asian Economics, 27*, 71-86. doi: http://dx.doi.org/10.1016/j.asieco.2013.06.002

Ramankutty, N., Foley, J. A., Norman, J., & McSweeney, K. (2002). The global distribution of cultivable lands: current patterns and sensitivity to possible climate change. *Global Ecology and Biogeography, 11*(5), 377-392.

Ravallion, M. (1995). Growth and poverty: Evidence for developing countries in the 1980s. *Economics Letters, 48*(3–4), 411-417. doi: http://dx.doi.org/10.1016/0165-1765(94)00620-H

Ravallion, M. (2001). Growth, Inequality and Poverty: Looking Beyond Averages. *World Development, 29*(11), 1803-1815. doi: http://dx.doi.org/10.1016/S0305-750X(01)00072-9

Roemer, M., & Gugerty, M. K. (1997). Does economic growth reduce poverty? *CAER II, 499*.

Sawhill, I. (1976). Discrimination and Poverty among Women Who Head Families. *Signs, 1*(3), 201-211.

Sherif, M. (1958). Superordinate Goals in the Reduction of Intergroup Conflict. *American Journal of Sociology, 63*(4), 349-356.

Sowell, T. (1981). *Ethnic America: a history*: Basic Books.

Stiglitz, J. (1990). Peer Monitoring and Credit Markets. *The World Bank Economic Review, Volume 4, Number 3*, 351-366.

Stiglitz, J., & Weiss, A. (1990). Credit Rationing in Markets with Imperfect Information. *American Economic Review, Volume 71, Number 3*, 393-410.

Sturgis, P., Brunton-Smith, I., Read, S., & Allum, N. (2011). Does ethnic diversity erode trust? Putnam's 'hunkering down'thesis reconsidered. *British Journal of Political Science, 41*(01), 57-82.

Tarabini, A. (2010). Education and poverty in the global development agenda: Emergence, evolution and consolidation. *International Journal of Educational Development, 30*(2), 204-212.

Tebaldi, E., & Mohan, R. (2010). Institutions and Poverty. *The Journal of Development Studies, 46*(6), 1047-1066. doi: 10.1080/00220380903012730

Varshney, A. (2003). *Ethnic conflict and civic life: Hindus and Muslims in India*. New Haven: Yale University Press.

United Nations (2013) The Millennium Development Goals Report 2013, United Nations: Geneva

Wang, C., & Steiner, B. (2015). Can Ethno-Linguistic Diversity Explain Cross-Country Differences in Social Capital?: A Global Perspective. *Economic Record, 91*(294), 338-366. doi: 10.1111/1475-4932.12195

White, H., & Anderson, E. (2001). Growth versus distribution: does the pattern of growth matter? *Development Policy Review, 19*(3), 267-289.

Wilson, K. L., & Portes, A. (1980). Immigrant Enclaves: An Analysis of the Labor Market Experiences of Cubans in Miami. *American Journal of Sociology, 86*(2), 295-319.

Yunus, M. (1999). *Banker to the poor: Micro-lending and the battle against world poverty*. New York: Public Affairs.

Yunus, M. (2007, Fall2007). Credit for the Poor, Editorial, *Harvard International Review,* pp. 20-24.

Yunus, M. (2008). Turning Beggars Into Entrepreneurs. *NPQ: New Perspectives Quarterly, 25*(2), 88-89. doi: 10.1111/j.1540-5842.2008.00990.x

Zhuang, J., Gunatilake, H. M., Niimi, Y., Khan, m. e., Jiang, Y., Hasan, R., . . . Huang, B. (2010). Financial Sector Development, Economic Growth, and Poverty Reduction: A Literature Review. Rochester.

Table 1 Description and Summary of Variables

Variable	Description	Mean	Std Dev	Min	Max
Ethnic Index 1	Index of Ethnic Fractionalization from Alesina and Zhuravskaya (2011)	0.44	0.29	0.004	0.92
Linguistic Index 1	Index of Linguistic Fractionalization from Alesina and Zhuravskaya (2011)	0.42	0.28	0.004	0.88
Ethnic Index 2	Index of Ethnic Fractionalization from Alesina et al. (2003)	0.52	0.23	0.05	0.93
Linguistic Index 2	Index of Linguistic Fractionalization from Alesina et al. (2003)	0.48	0.30	0.02	0.92
MPI (revised)	Percentage of the population that is multidimensionally poor adjusted by the intensity of the deprivations (revised measure)	0.18	0.18	0.001	0.58
MPH (revised)	Percentage of the population with a weighted deprivation score of at least 33 percent (revised measure)	2.78	1.60	-0.92	4.49
MPI (2010)	Percentage of the population that is multidimensionally poor adjusted by the intensity of the deprivations (2010 measure)	0.19	0.19	0	0.61
MPH (2010)	Percentage of the population with a weighted deprivation score of at least 33 percent (2010 measure)	2.88	1.61	-1.61	4.49
Population in MP	Percentage of the population in multidimensional poverty	8.25	2.22	2.89	13.36
Intensity of deprivation	Average percentage of deprivation experienced by people in multidimensional poverty	3.83	0.17	3.54	4.17
Population below $1.90	Number of people living on less than $1.90	0.78	2.29	-5.18	5.88
Population below $3.10	Number of people living on less than $3.10	1.59	2.13	-5.11	6.66
Poverty gap at $1.90	Mean shortfall in income or consumption from the poverty line $1.90 a day expressed as a percentage of the poverty line	1.25	1.88	-3.24	3.48
Poverty gap at $3.10	Mean shortfall in income or consumption from the poverty line $3.10 a day expressed as a percentage of the poverty line	2.20	1.66	-4.13	3.95
Headcount ratio at $1.90	The percentage of the population living on less than $1.90 a day	2.40	1.67	-2.88	4.28
Headcount ratio at $3.10	The percentage of the population living on less than $3.10 a day	3.21	1.40	-1.99	4.49
Economic Growth	GDP Per Capita Growth Rate	0.01	0.02	-0.03	0.08
Income	GDP Per Capita	7.89	0.85	6.27	9.44
Unemployment	Country unemployment rate	8.75	6.88	0.60	34.27
Institutional Quality	Average of World Bank Governance Indicators	-0.45	0.53	-1.46	1.25
Literacy Rate	Country literacy rate	4.25	0.42	3.06	4.60
Inequality	GINI index	3.72	0.21	3.33	4.14
Urbanization Rate	Urban Population (Percentage)	3.63	0.59	2.24	4.48
Land quality	Variations in land quality in a country from Michalopoulos (2012)	0.31	1.30	-0.93	4.25
Elevation	Variations in elevation in a country from Michalopoulos (2012)	0.29	0.80	1.30	1.98
Latitude	Absolute latitude of a country	0.24	0.18	0.80	0.67

Table 2A - Ethnic Diversity and Poverty Measures (OLS Results)

VARIABLES	(1) MPI (Revised)	(2) MPH (Revised)	(3) Intensity of deprivation	(3) Population below $1.90	(3) Population below $3.10	(6) Poverty gap ($1.90)	(7) Poverty gap ($3.10)	(8) headcount ratio ($1.90)	(9) headcount ratio ($3.10)
Ethnic	0.08**	1.06**	0.15***	2.43*	2.29*	0.76	0.78*	0.88	0.74*
	(0.04)	(0.46)	(0.04)	(1.26)	(1.16)	(0.58)	(0.44)	(0.53)	(0.37)
	[0.12]	[0.20]	[0.26]	[0.31]	[0.31]	[0.12]	[0.14]	[0.15]	[0.15]
Economic Growth	0.41	9.13	1.74***	50.72***	49.73***	17.03**	20.98***	20.38***	19.41***
	(0.61)	(6.65)	(0.49)	(14.56)	(14.13)	(6.93)	(5.56)	(6.31)	(5.27)
	[0.05]	[0.12]	[0.22]	[0.42]	[0.44]	[0.18]	[0.24]	[0.23]	[0.26]
Income	-0.05	-0.54**	-0.06**	-0.38	-0.12	-1.27***	-1.09***	-1.12***	-0.86***
	(0.03)	(0.27)	(0.02)	(0.58)	(0.53)	(0.32)	(0.24)	(0.28)	(0.21)
	[-0.20]	[-0.28]	[-0.26]	[-0.14]	[-0.05]	[-0.61]	[-0.56]	[-0.57]	[-0.52]
Unemployment	0.00	-0.01	-0.00	-0.04	-0.04	0.02	0.03***	0.03**	0.03***
	(0.00)	(0.02)	(0.00)	(0.03)	(0.03)	(0.02)	(0.01)	(0.01)	(0.01)
	[0.02]	[-0.04]	[-0.06]	[-0.12]	[-0.12]	[0.10]	[0.14]	[0.11]	[0.15]
Institutional Quality	-0.01	-0.13	-0.02	-1.06**	-1.10**	-0.46	-0.75***	-0.64**	-0.69***
	(0.03)	(0.27)	(0.03)	(0.52)	(0.49)	(0.30)	(0.25)	(0.26)	(0.20)
	[-0.03]	[-0.04]	[-0.05]	[-0.25]	[-0.27]	[-0.14]	[-0.24]	[-0.20]	[-0.26]
Literacy Rate	-0.28***	-1.30***	-0.26***	-0.54	-0.34	-0.65**	-0.52**	-0.58**	-0.39*
	(0.04)	(0.31)	(0.04)	(0.53)	(0.50)	(0.31)	(0.24)	(0.27)	(0.20)
	[-0.68]	[-0.37]	[-0.67]	[-0.10]	[-0.07]	[-0.15]	[-0.13]	[-0.15]	[-0.12]
Inequality	0.08*	2.99***	0.20***	2.14	1.17	3.66***	2.97***	3.06***	2.10***
	(0.04)	(0.52)	(0.05)	(1.80)	(1.88)	(0.79)	(0.63)	(0.67)	(0.60)
	[0.10]	[0.41]	[0.26]	[0.20]	[0.12]	[0.44]	[0.38]	[0.39]	[0.32]
Urbanization Rate	-0.03	-0.58*	0.03	-0.30	-0.13	-0.23	0.01	-0.15	0.03
	(0.04)	(0.29)	(0.03)	(0.72)	(0.66)	(0.46)	(0.30)	(0.36)	(0.26)
	[-0.09]	[-0.22]	[0.10]	[-0.08]	[-0.04]	[-0.08]	[0.00]	[-0.05]	[0.01]
Constant	1.43***	2.67	4.38***	-2.53	-1.46	0.16	0.79	1.66	2.69
	(0.24)	(2.33)	(0.28)	(7.15)	(7.27)	(3.23)	(2.55)	(2.80)	(2.33)
Observations	48	48	48	60	60	60	60	60	60
R-squared	0.87	0.82	0.84	0.59	0.56	0.81	0.84	0.83	0.82

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 2B - Linguistic Diversity and Poverty Measures (OLS Results)

VARIABLES	(1) MPI (Revised)	(2) MPH (Revised)	(3) Intensity of deprivation	(3) Population below $1.90	(3) Population below $3.10	(6) Poverty gap ($1.90)	(7) Poverty gap ($3.10)	(8) headcount ratio ($1.90)	(9) headcount ratio ($3.10)
Language	0.09***	1.02*	0.13***	1.65	1.62	0.43	0.58	0.61	0.56
	(0.03)	(0.53)	(0.05)	(1.26)	(1.17)	(0.55)	(0.45)	(0.52)	(0.39)
	[0.15]	[0.19]	[0.22]	[0.21]	[0.22]	[0.07]	[0.10]	[0.10]	[0.12]
Economic Growth	0.53	5.89	1.35**	45.84***	44.55***	15.28**	18.06***	17.34***	16.06***
	(0.54)	(6.88)	(0.58)	(13.26)	(12.78)	(6.60)	(5.68)	(6.39)	(5.47)
	[0.07]	[0.08]	[0.18]	[0.41]	[0.42]	[0.17]	[0.22]	[0.21]	[0.23]
Income	-0.06**	-0.76***	-0.07***	-0.87*	-0.48	-1.58***	-1.27***	-1.36***	-0.97***
	(0.02)	(0.27)	(0.02)	(0.51)	(0.48)	(0.30)	(0.23)	(0.27)	(0.21)
	[-0.27]	[-0.38]	[-0.33]	[-0.33]	[-0.19]	[-0.76]	[-0.64]	[-0.69]	[-0.59]
Unemployment	0.00	-0.01	-0.00	-0.04	-0.04	0.03	0.04***	0.03**	0.03***
	(0.00)	(0.02)	(0.00)	(0.03)	(0.03)	(0.02)	(0.01)	(0.01)	(0.01)
	[0.01]	[-0.03]	[-0.09]	[-0.13]	[-0.14]	[0.11]	[0.15]	[0.13]	[0.16]
Institutional Quality	-0.01	-0.02	0.00	-0.74	-0.85	-0.27	-0.62**	-0.48*	-0.59***
	(0.03)	(0.29)	(0.03)	(0.53)	(0.51)	(0.28)	(0.25)	(0.25)	(0.21)
	[-0.02]	[-0.01]	[0.01]	[-0.17]	[-0.21]	[-0.08]	[-0.20]	[-0.15]	[-0.22]
Literacy Rate	-0.27***	-1.21***	-0.24***	-0.33	-0.18	-0.55*	-0.45*	-0.50*	-0.35*
	(0.04)	(0.31)	(0.04)	(0.50)	(0.49)	(0.31)	(0.24)	(0.28)	(0.20)
	[-0.65]	[-0.34]	[-0.64]	[-0.06]	[-0.04]	[-0.13]	[-0.11]	[-0.13]	[-0.11]
Inequality	0.10**	3.04***	0.21***	2.39	1.45	3.54***	2.78***	2.84***	1.91***
	(0.04)	(0.55)	(0.05)	(1.74)	(1.77)	(0.81)	(0.66)	(0.74)	(0.62)
	[0.12]	[0.41]	[0.26]	[0.23]	[0.15]	[0.42]	[0.35]	[0.36]	[0.29]
Urbanization Rate	-0.02	-0.36	0.04	0.14	0.20	0.04	0.15	0.05	0.12
	(0.04)	(0.31)	(0.03)	(0.61)	(0.62)	(0.31)	(0.26)	(0.27)	(0.24)
	[-0.05]	[-0.13]	[0.14]	[0.04]	[0.06]	[0.01]	[0.05]	[0.02]	[0.05]
Constant	1.40***	3.12	4.42***	-1.34	-0.88	1.96	2.22	3.53	3.96
	(0.25)	(2.48)	(0.31)	(7.21)	(7.05)	(3.59)	(2.83)	(3.25)	(2.55)
Observations	49	49	49	60	60	60	60	60	60
R-squared	0.88	0.80	0.83	0.59	0.55	0.83	0.84	0.83	0.81

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 3A - Ethnic Diversity and Poverty Measures (2SLS Results)

VARIABLES	(1) MPI (Revised)	(2) MPH (Revised)	(3) Intensity of deprivation	(3) Population below $1.90	(3) Population below $3.10	(6) Poverty gap ($1.90)	(7) Poverty gap ($3.10)	(8) headcount ratio ($1.90)	(9) headcount ratio ($3.10)
Ethnic	0.23**	4.49***	0.45***	4.36**	4.12*	1.80**	1.95***	2.26***	2.00***
	(0.11)	(1.53)	(0.16)	(2.16)	(2.14)	(0.83)	(0.69)	(0.79)	(0.62)
	[0.37]	[0.83]	[0.77]	[0.56]	[0.56]	[0.30]	[0.34]	[0.40]	[0.42]
Economic Growth	1.16	26.12**	3.22**	59.06***	57.60***	21.53***	26.01***	26.32***	24.85***
	(0.93)	(13.20)	(1.31)	(15.65)	(15.33)	(6.96)	(5.46)	(6.29)	(5.21)
	[0.14]	[0.36]	[0.41]	[0.49]	[0.51]	[0.23]	[0.30]	[0.30]	[0.34]
Income	-0.03	-0.24	-0.03	-0.19	0.05	-1.17***	-0.98***	-0.98***	-0.74***
	(0.03)	(0.35)	(0.04)	(0.56)	(0.52)	(0.29)	(0.23)	(0.26)	(0.20)
	[-0.14]	[-0.12]	[-0.14]	[-0.07]	[0.02]	[-0.56]	[-0.50]	[-0.50]	[-0.45]
Unemployment	0.00	0.01	-0.00	-0.02	-0.02	0.03*	0.04***	0.04**	0.04***
	(0.00)	(0.03)	(0.00)	(0.03)	(0.03)	(0.02)	(0.01)	(0.02)	(0.01)
	[0.05]	[0.03]	[-0.01]	[-0.07]	[-0.07]	[0.13]	[0.18]	[0.16]	[0.20]
Institutional Quality	-0.04	-0.76	-0.07	-1.09**	-1.13***	-0.48*	-0.77***	-0.66***	-0.70***
	(0.04)	(0.46)	(0.05)	(0.47)	(0.44)	(0.28)	(0.23)	(0.24)	(0.19)
	[-0.11]	[-0.22]	[-0.20]	[-0.25]	[-0.28]	[-0.14]	[-0.24]	[-0.21]	[-0.26]
Literacy Rate	-0.26***	-0.91*	-0.22***	-0.31	-0.13	-0.53	-0.39	-0.42	-0.24
	(0.04)	(0.51)	(0.05)	(0.59)	(0.56)	(0.32)	(0.28)	(0.32)	(0.26)
	[-0.64]	[-0.26]	[-0.58]	[-0.06]	[-0.03]	[-0.13]	[-0.10]	[-0.11]	[-0.07]
Inequality	0.09**	3.11***	0.21***	0.91	0.02	3.00***	2.23***	2.19***	1.31**
	(0.04)	(0.77)	(0.07)	(1.85)	(1.90)	(0.81)	(0.67)	(0.71)	(0.62)
	[0.11]	[0.42]	[0.27]	[0.08]	[0.00]	[0.36]	[0.29]	[0.28]	[0.20]
Urbanization Rate	-0.03	-0.63	0.03	-0.64	-0.44	-0.41	-0.19	-0.39	-0.19
	(0.04)	(0.49)	(0.05)	(0.75)	(0.70)	(0.44)	(0.32)	(0.37)	(0.29)
	[-0.10]	[-0.24]	[0.09]	[-0.16]	[-0.12]	[-0.14]	[-0.07]	[-0.14]	[-0.08]
Constant	1.14***	-3.96	3.80***	-0.54	0.42	1.24	2.00	3.08	3.99*
	(0.28)	(4.29)	(0.41)	(6.46)	(6.54)	(3.06)	(2.50)	(2.73)	(2.28)
Observations	48	48	48	60	60	60	60	60	60
R-squared	0.83	0.53	0.65	0.57	0.53	0.80	0.82	0.80	0.78
Over identifying restriction									
Test statistic	1.3493	0.3653	4.6555	0.0777	3.0669	0.5467	2.7834	0.3994	2.5149
P-value	0.5093	0.8330	0.0975	0.9619	0.2158	0.7608	0.2487	0.8190	0.2844

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 3B - Linguistic Diversity and Poverty Measures (2SLS Results)

VARIABLES	(1) MPI (Revised)	(2) MPH (Revised)	(3) Intensity of deprivation	(3) Population below $1.90	(3) Population below $3.10	(6) Poverty gap ($1.90)	(7) Poverty gap ($3.10)	(8) headcount ratio ($1.90)	(9) headcount ratio ($3.10)
Language	0.18	5.00***	0.42**	6.42**	6.23**	1.90*	2.21**	2.53**	2.33***
	(0.12)	(1.89)	(0.18)	(2.62)	(2.60)	(1.00)	(0.93)	(1.05)	(0.88)
	[0.28]	[0.91]	[0.71]	[0.83]	[0.85]	[0.31]	[0.38]	[0.44]	[0.48]
Economic Growth	0.77	17.64	2.19*	60.51***	58.75***	19.84***	23.06***	23.27***	21.52***
	(0.64)	(13.33)	(1.13)	(15.70)	(15.32)	(6.81)	(5.82)	(6.80)	(5.85)
	[0.10]	[0.25]	[0.29]	[0.54]	[0.55]	[0.22]	[0.27]	[0.28]	[0.30]
Income	-0.06**	-0.55	-0.06	-0.65	-0.26	-1.52***	-1.19***	-1.27***	-0.89***
	(0.02)	(0.41)	(0.04)	(0.59)	(0.58)	(0.26)	(0.22)	(0.26)	(0.22)
	[-0.25]	[-0.28]	[-0.26]	[-0.24]	[-0.11]	[-0.72]	[-0.60]	[-0.64]	[-0.54]
Unemployment	0.00	-0.01	-0.00	-0.02	-0.02	0.04*	0.04***	0.04**	0.04***
	(0.00)	(0.04)	(0.00)	(0.03)	(0.03)	(0.02)	(0.01)	(0.02)	(0.01)
	[0.01]	[-0.05]	[-0.10]	[-0.07]	[-0.08]	[0.14]	[0.18]	[0.17]	[0.19]
Institutional Quality	-0.02	-0.40	-0.02	-0.64	-0.75	-0.24	-0.59**	-0.44	-0.56**
	(0.03)	(0.48)	(0.04)	(0.60)	(0.57)	(0.29)	(0.26)	(0.28)	(0.23)
	[-0.04]	[-0.12]	[-0.06]	[-0.15]	[-0.19]	[-0.07]	[-0.19]	[-0.14]	[-0.21]
Literacy Rate	-0.25***	-0.34	-0.18***	0.61	0.73	-0.26	-0.13	-0.12	-0.00
	(0.04)	(0.66)	(0.06)	(0.81)	(0.79)	(0.37)	(0.35)	(0.40)	(0.34)
	[-0.61]	[-0.10]	[-0.48]	[0.11]	[0.15]	[-0.06]	[-0.03]	[-0.03]	[-0.00]
Inequality	0.11***	3.61***	0.25***	0.28	-0.59	2.88***	2.07***	1.99***	1.13*
	(0.03)	(0.83)	(0.07)	(1.69)	(1.75)	(0.77)	(0.69)	(0.74)	(0.66)
	[0.13]	[0.49]	[0.31]	[0.03]	[-0.06]	[0.34]	[0.26]	[0.25]	[0.17]
Urbanization Rate	-0.02	-0.46	0.03	-0.59	-0.50	-0.19	-0.10	-0.25	-0.15
	(0.04)	(0.58)	(0.05)	(0.85)	(0.84)	(0.38)	(0.36)	(0.39)	(0.35)
	[-0.06]	[-0.17]	[0.12]	[-0.15]	[-0.14]	[-0.06]	[-0.04]	[-0.09]	[-0.06]
Constant	1.21***	-6.03	3.76***	0.59	0.99	2.56	2.88	4.31	4.68*
	(0.28)	(5.26)	(0.46)	(6.18)	(6.18)	(3.20)	(2.69)	(3.02)	(2.53)
Observations	49	49	49	60	60	60	60	60	60
R-squared	0.86	0.40	0.65	0.40	0.35	0.80	0.80	0.77	0.74
Over identifying restriction									
Test statistics	0.1245	0.3290	1.8847	0.9814	2.1507	1.0290	3.1147	0.0466	3.4522
P-value	0.9396	0.8483	0.3897	0.6122	0.3412	0.5978	0.2107	0.9770	0.1780

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 4A - Fractionalization and Poverty (Alternate Poverty Measures)

VARIABLES	Ethnic Fractionalization			Linguistic Fractionalization		
	MPI (2010)	MPH (2010)	Population in MP	MPI (2010)	MPH (2010)	Population in MP
Fractionalization	0.23**	4.75***	5.31**	0.22**	4.36***	8.77**
	(0.10)	(1.75)	(2.70)	(0.11)	(1.68)	(3.95)
	[0.37]	[0.89]	[0.68]	[0.33]	[0.78]	[0.90]
Economic Growth	0.81	21.46	45.81**	0.61	10.30	49.03**
	(0.78)	(14.58)	(19.12)	(0.57)	(10.79)	(20.54)
	[0.09]	[0.30]	[0.43]	[0.07]	[0.15]	[0.50]
Income	-0.03	-0.13	0.49	-0.06***	-0.48	0.08
	(0.03)	(0.36)	(0.61)	(0.02)	(0.34)	(0.79)
	[-0.14]	[-0.07]	[0.17]	[-0.24]	[-0.24]	[0.03]
Unemployment	0.00	-0.00	-0.07*	-0.00	-0.02	-0.09*
	(0.00)	(0.03)	(0.04)	(0.00)	(0.03)	(0.05)
	[0.02]	[-0.02]	[-0.23]	[-0.01]	[-0.09]	[-0.30]
Institutional Quality	-0.04	-0.70	-1.15	-0.02	-0.34	-1.02
	(0.03)	(0.47)	(1.11)	(0.03)	(0.39)	(1.15)
	[-0.09]	[-0.20]	[-0.23]	[-0.05]	[-0.10]	[-0.21]
Literacy Rate	-0.26***	-0.75	-0.78	-0.24***	-0.35	0.48
	(0.04)	(0.54)	(0.74)	(0.04)	(0.60)	(1.17)
	[-0.63]	[-0.21]	[-0.15]	[-0.57]	[-0.10]	[0.10]
Inequality	0.07	2.57**	2.34*	0.09**	2.86***	3.41*
	(0.04)	(1.15)	(1.39)	(0.04)	(1.00)	(1.80)
	[0.08]	[0.33]	[0.22]	[0.10]	[0.37]	[0.32]
Urbanization Rate	-0.03	-0.67	-1.09	-0.03	-0.65	-0.76
	(0.04)	(0.53)	(0.69)	(0.04)	(0.49)	(0.99)
	[-0.10]	[-0.25]	[-0.29]	[-0.08]	[-0.23]	[-0.20]
Constant	1.25***	-3.20	-0.41	1.28***	-2.55	-8.89
	(0.29)	(5.54)	(7.47)	(0.28)	(4.96)	(11.70)
Observations	47	46	48	48	47	49
R-squared	0.85	0.45	0.37	0.87	0.51	0.41
Over identifying restriction						
Test statistic	0.6174	0.3218	5.6156	0.0497	1.4813	2.8096
P-value	0.7344	0.8514	0.0603	0.9755	0.4768	0.2454

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 4B - Fractionalization and Poverty (Alternate Fractionalization Measures)

VARIABLES	(1) MPI (Revised)	(2) MPH (Revised)	(3) Intensity of deprivation	(3) Population below $1.90	(3) Population below $3.10	(6) Poverty gap ($1.90)	(7) Poverty gap ($3.10)	(8) headcount ratio ($1.90)	(9) headcount ratio ($3.10)
Ethnic	0.16*	3.84***	0.34***	3.84**	3.66*	1.51**	1.70***	1.94***	1.76***
	(0.08)	(1.22)	(0.11)	(1.90)	(1.89)	(0.77)	(0.64)	(0.74)	(0.58)
Observations	56	57	57	69	69	69	69	69	69
R-squared	0.87	0.62	0.70	0.48	0.45	0.78	0.79	0.77	0.75
OIR P-value	0.6130	0.7017	0.6390	0.7906	0.0312	0.0439	0.3844	0.4689	0.1862
Language	0.17*	2.90***	0.29**	4.52*	4.35	1.81	2.04**	2.34**	2.16**
	(0.10)	(1.10)	(0.11)	(2.69)	(2.65)	(1.11)	(0.93)	(1.07)	(0.85)
Observations	55	55	55	67	67	67	67	67	67
R-squared	0.83	0.62	0.72	0.44	0.40	0.77	0.78	0.75	0.72
OIR P-value	0.7958	0.8203	0.7852	0.8793	0.0292	0.0431	0.2485	0.1459	0.4722

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 5 - Fractionalization and Poverty (PSM Results)

VARIABLES	(1) MPI (Revised)	(2) MPH (Revised)	(3) Intensity of deprivation	(3) Population below $1.90	(3) Population below $3.10	(6) Poverty gap ($1.90)	(7) Poverty gap ($3.10)	(8) headcount ratio ($1.90)	(9) headcount ratio ($3.10)
Ethnic	-0.08***	-0.21***	-0.09**	-0.92***	-0.83***	-0.50*	-0.48**	-0.50**	-0.41**
	(0.03)	(0.04)	(0.03)	(0.26)	(0.14)	(0.27)	(0.22)	(0.25)	(0.20)
Observations	48	48	48	60	60	60	60	60	60
Language	-0.10***	-0.73	-0.12***	0.52	0.35	0.19	-0.08**	0.03	-0.15**
	(0.04)	(0.62)	(0.02)	(0.62)	(0.55)	(0.27)	(0.03)	(0.26)	(0.05)
Observations	48	48	48	60	60	60	60	60	60

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Appendix Table A1

Argentina	Gabon	Pakistan
Armenia	Ghana	Panama
Bangladesh	Guatemala	Paraguay
Belarus	Guinea	Peru
Benin	Honduras	Philippines
Bolivia	Hungary	Romania
Brazil	India	Russian Federation
Bulgaria	Indonesia	Rwanda
Burkina Faso	Jordan	Senegal
Cambodia	Kazakhstan	South Africa
Cameroon	Kenya	Sri Lanka
Central African Republic	Kyrgyz Republic	Tajikistan
Chile	Lesotho	Tanzania
China	Macedonia, FYR	Togo
Colombia	Malawi	Turkey
Costa Rica	Mali	Uganda
Cote d'Ivoire	Mexico	Ukraine
Croatia	Morocco	Uzbekistan
Ecuador	Nepal	Vietnam
Ethiopia	Niger	Zambia

Figure A1 - Ethnic fractionalization and MPI

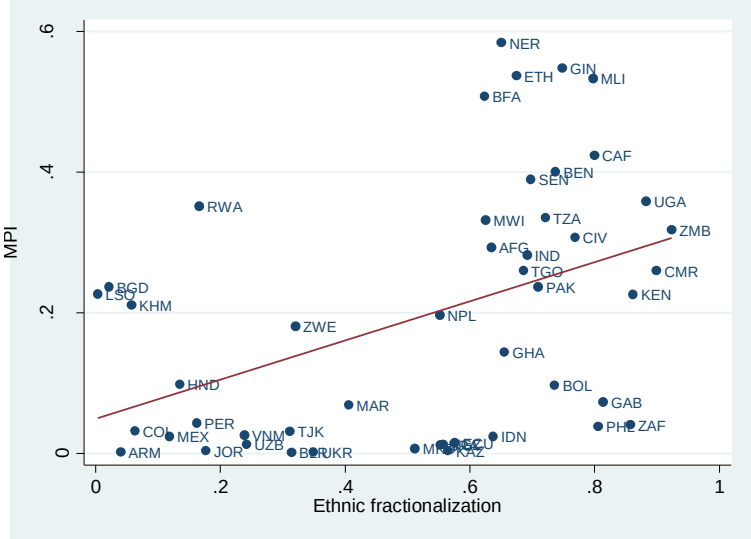

Figure A2 - Ethnic fractionalization and Poverty headcount

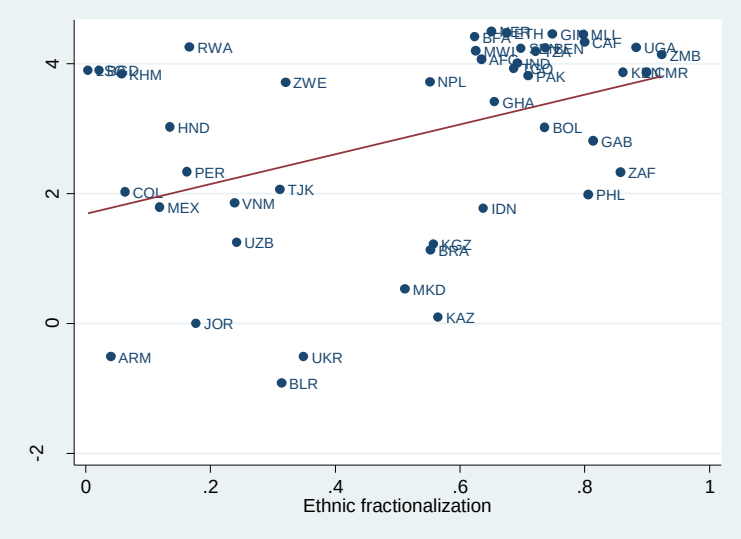

Figure A3 - Ethnic fractionalization and Intensity of Deprivation

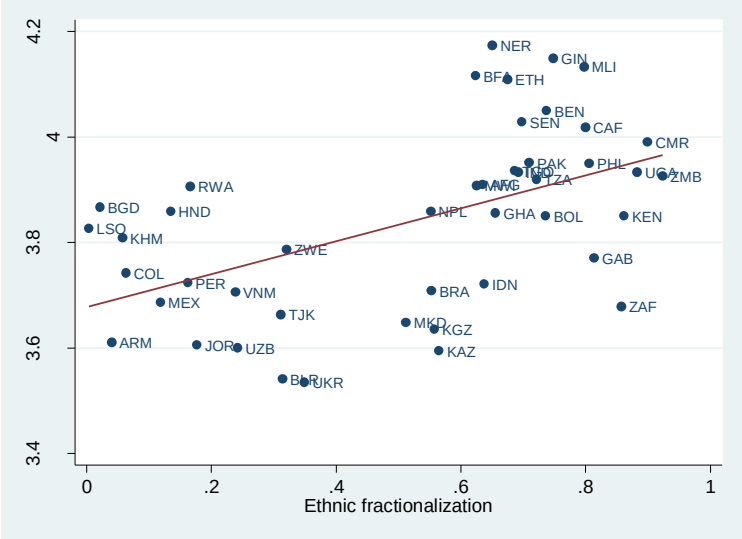

Figure A4 - Ethnic fractionalization and Population below $1.90

Figure A5 - Ethnic fractionalization and Population below $3.10

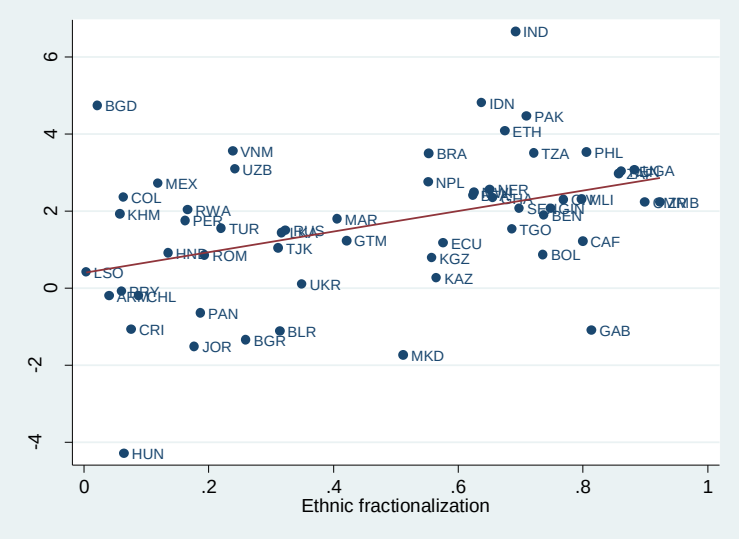

Figure A6 - Ethnic fractionalization and Poverty gap at $1.90

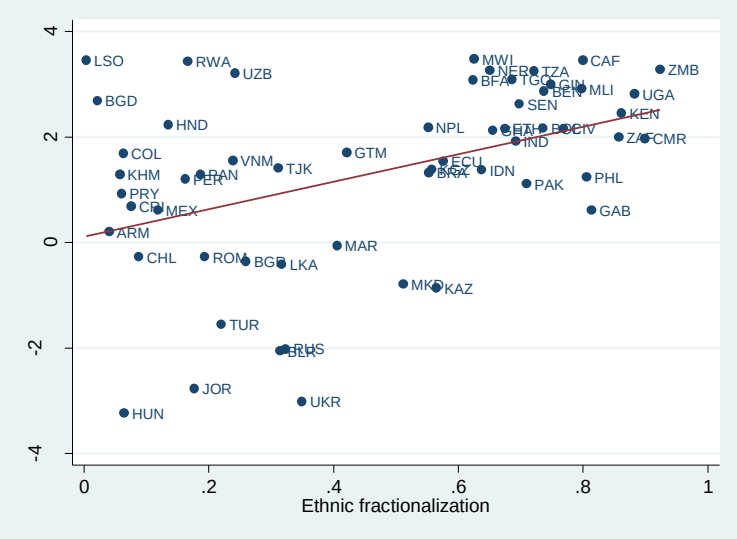

Figure A7 - Ethnic fractionalization and Poverty gap at $3.10

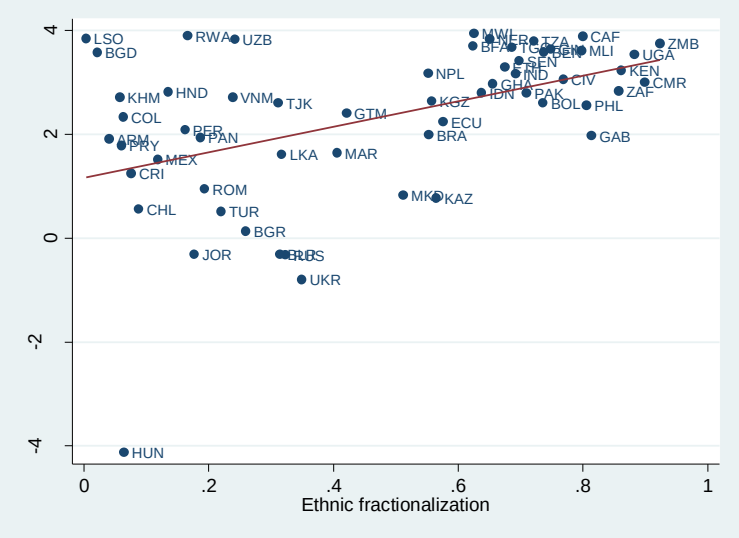

Figure A8 - Ethnic fractionalization and Headcount ratio at $1.90

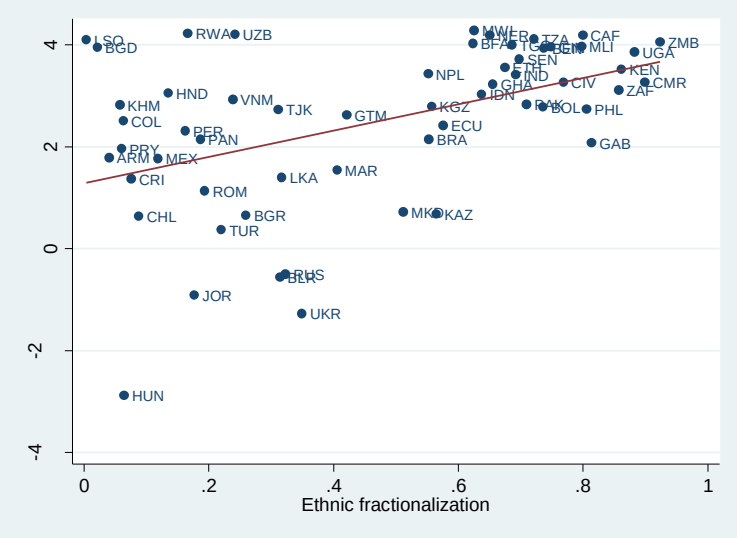

Figure A9 - Ethnic fractionalization and Headcount ratio $3.10

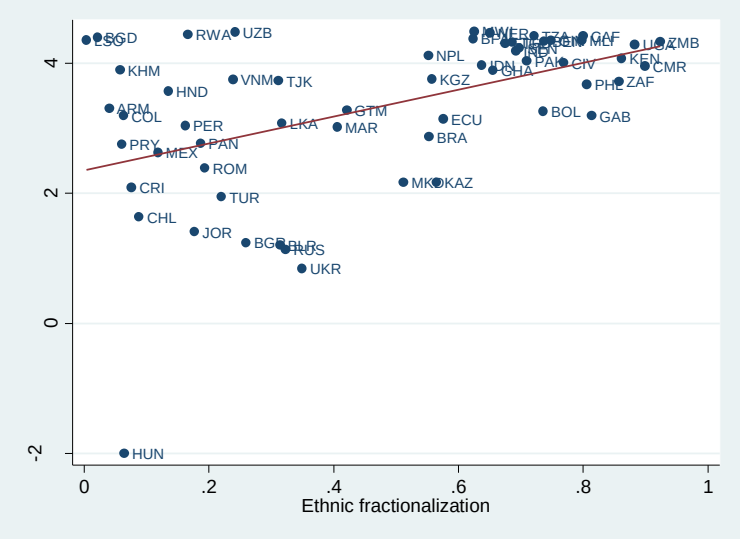

Figure A10 - Linguistic fractionalization and MPI

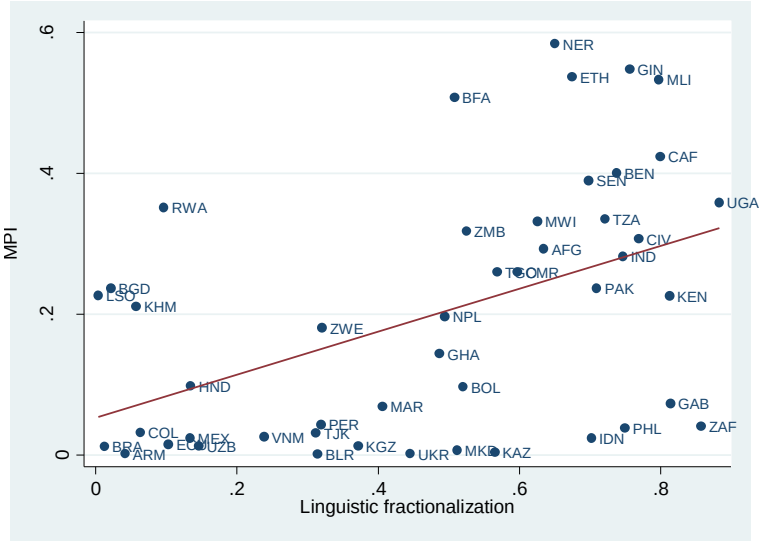

Figure A11 - Linguistic fractionalization and Poverty headcount

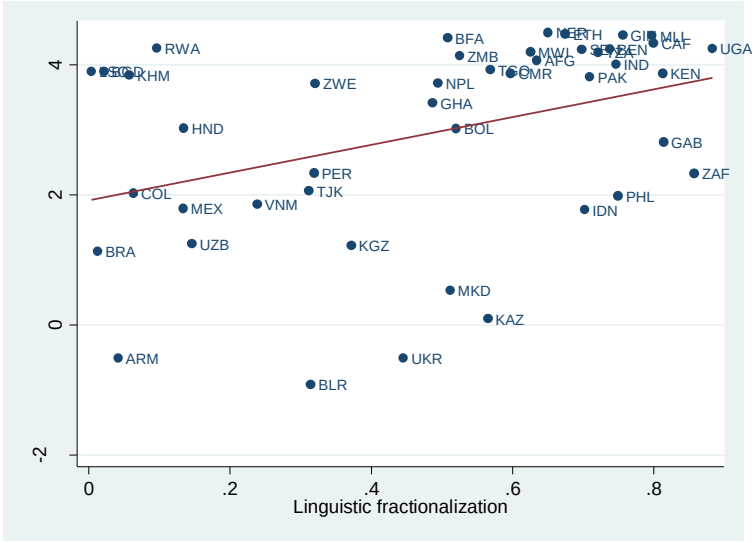

Figure A12 - Linguistic fractionalization and Intensity of Deprivation

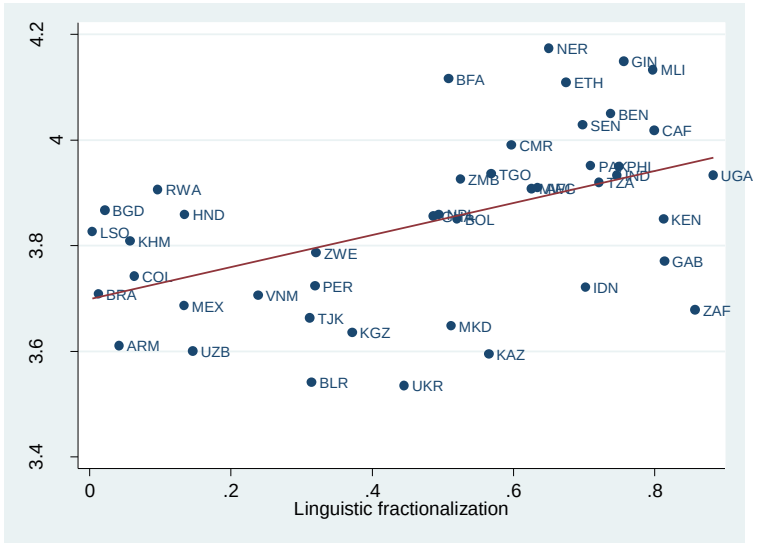

Figure A13 - Linguistic fractionalization and Population below $1.90

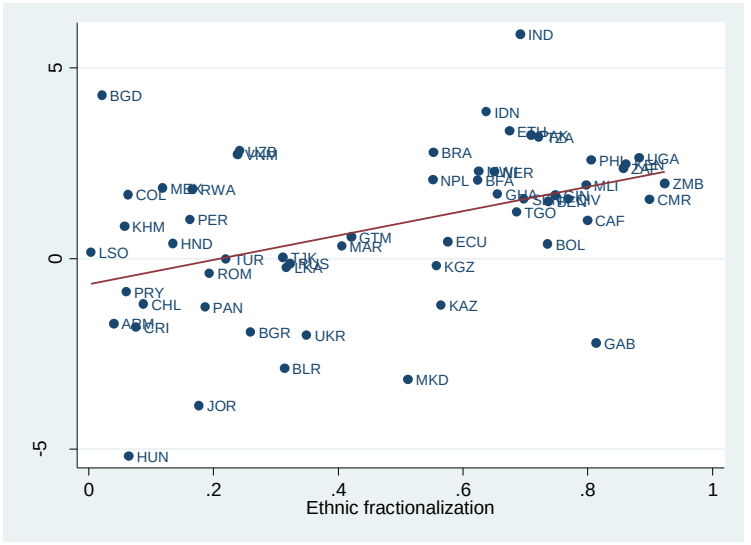

Figure A14 - Linguistic fractionalization and Population below $3.10

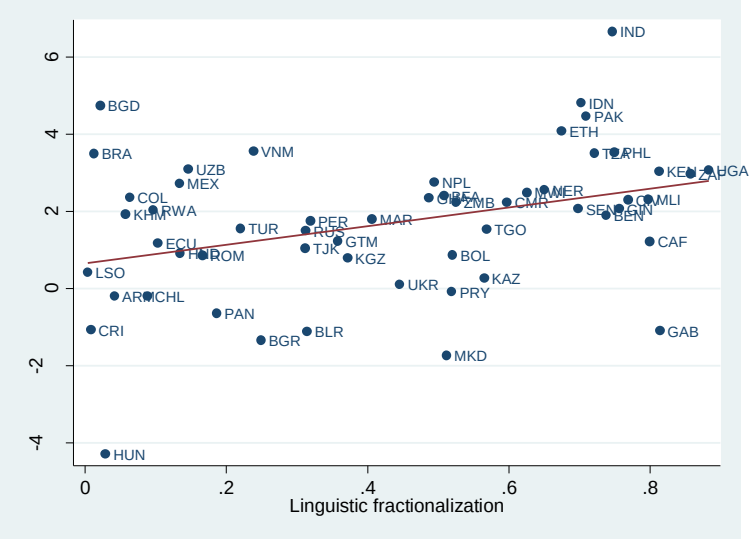

Figure A15 - Linguistic fractionalization and Poverty gap at $1.90

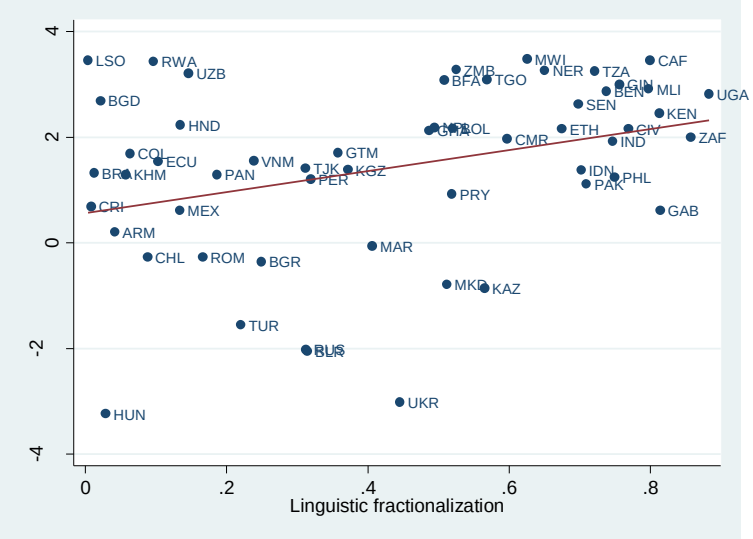

Figure A16 - Linguistic fractionalization and Poverty gap at $3.10

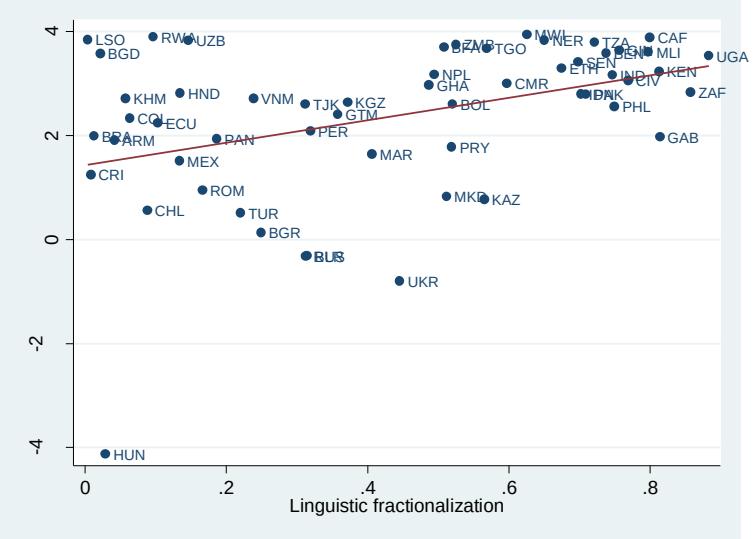

Figure A17 - Linguistic fractionalization and Headcount ratio at $1.90

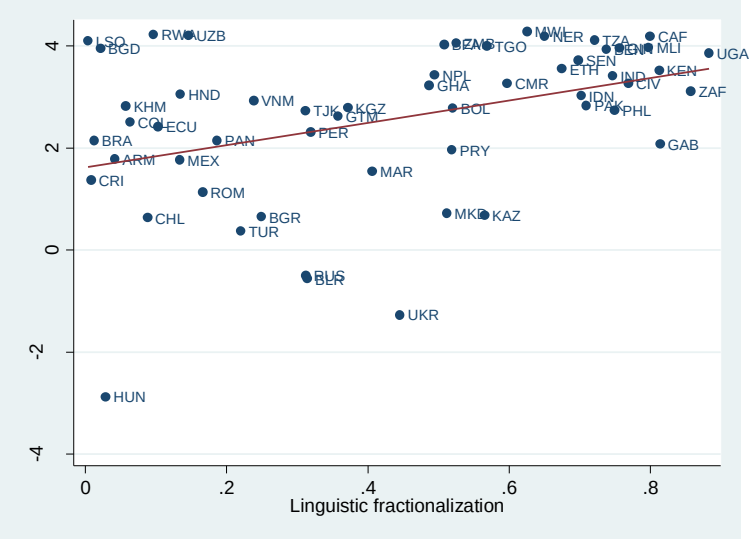

Figure A18 - Ethnic fractionalization and Headcount ratio $3.10