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ABSTRACT

Previous studies have yielded mixed results on the impact of cultural diversity on economic performance. We find a positive relationship in the United States between cultural diversity and a comprehensive measure of human development that incorporates health, education, and income. We also disaggregate cultural diversity into three components including ethnicity, language, and religion. We find a positive relationship between human development and both religious and language diversity, and a negative relationship with ethnic diversity. These relationships are robust, using several alternative mathematical measures of diversity. Our results are consistent with diversity generating benefits from exposure to a variety of experiences, ideas, and skills while introducing costs due to difficulty in communication, difference in preferences, and conflict between polarized groups. We conclude that strong institutions are essential to maximize the benefits of diversity while mitigating the associated costs.

KEY WORDS Diversity; Human Development; Ethnicity; Language; Religion

Diversity is often promoted as a positive outcome and pursued as a goal by organizations, communities, and governments. Diversity provides exposure to a variety of experiences, ideas, and skills; however, while some diverse societies seem to thrive, others seem to

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struggle. Diverse societies may suffer from difficulty in communication, difference in preferences, and conflict between polarized groups. Because of these potential costs and benefits of diversity, it is not surprising that previous research into the relationship between diversity and economic development has yielded mixed results. Most studies have found a negative relationship between diversity and economic development, whereas others have reported a positive or mixed relationship, or no relationship.

In this paper, we disaggregate the impact of cultural diversity on human development in the United States by separating diversity into categories that include ethnicity, language, and religion. We utilize a comprehensive measure of human development, unlike most previous studies that focused on measures of economic performance such as growth rates. We use state-level data from the United States that allow us to examine the tradeoffs between the costs and benefits of diversity in the presence of consistently strong institutions.

PREVIOUS RESEARCH

In terms of economic performance, researchers have published myriad results on the impact of cultural diversity. Many researchers have reported a negative relationship between cultural diversity and economic performance, typically measured as growth in per capita income (Alesina et al. 2003; Annet 2001; Barro and McCleary 2003; Easterly and Levine 1997; Grafton, Knowles, and Owen 2004; Montalvo and Reynal-Querol 2005). In contrast, some researchers have reported a positive impact (Florida and Tingali 2004), some have found no significant impact (Lian and Oneal 1997), and still others have reported mixed results (Alesina and La Ferrara 2005; DiRienzo, Das, and Burbridge 2007; VanAlstine, Cox, and Roden, 2013).

These inconsistent results may reflect the presence of both costs and benefits relating to diversity. Although diversity can enhance creativity and innovation by introducing a variety of ideas and skills, it can also result in inefficiencies due to difficulty in communication, differences in preferences, and conflicts between polarized groups.

Costs of Diversity

Ethnic, language, and religious differences can introduce social barriers to communication that can reduce productivity. Barro (1999) found that language diversity raises transaction costs and results in public policies that retard growth. Grafton et al. (2004) pointed out that barriers to communication and lack of trust can prevent mutually beneficial exchange of ideas. As a result, linguistically homogenous societies may be more effective in communicating ideas among themselves, allowing for faster technological development and economic growth.

Ethnic groups may have different preferences regarding their choice of public goods. Greif (1993) found that it is more efficient to transact with members of one's own

type and that diversity introduces costs and inefficiencies due to competing demands of disparate groups. Alesina and La Ferrara (2000) found that increased diversity lowers the utility from public good consumption.

History is replete with examples of social conflict due to cultural diversity. Conflicts such as these have the clear potential to retard economic development. Easterly and Levine (1997) found that ethnic diversity is a predictor of potential conflict and political instability. Shleifer and Vishny (1993) showed that ethnically diverse societies are likely to have higher rates of corruption. Collier (2000) found that cultural heterogeneity hampers growth because ethnically divided societies are prone to polarization and social conflict. Religious differences are often a barrier to social integration and are a common source of stress and conflict (Warf and Vincent 2007). Grim and Finke (2007) found that restriction of religious freedom correlates with diminished well-being and violent social conflict.

Benefits of Diversity

A diverse populace provides different perspectives and opportunities for the exchange of new ideas that can stimulate innovation and creativity. The concept of collective intelligence describes the positive historical relationship between the amount of interaction between diverse individuals and the inventiveness and rate of cultural change of a population (Ridley 2010).

A diverse mix of people brings together complementary abilities and experiences that may lead to productivity gains. Lazear (1999) found that higher diversity levels lead to innovation by increasing the number of ways that groups frame problems, producing a richer set of alternative solutions. Florida and Tingali (2004) found that a more diverse society leads to a more creative and innovative workforce that increases competitiveness. Interaction among different cultures encourages competition and exchange of ideas from different worldviews. Sobel, Dutta, and Roy (2010) showed that higher levels of cultural diversity increase the rate of entrepreneurship in the presence of good institutions.

Nonlinear Relationship

The relationship between cultural diversity and human development may be more complex than a simple linear relationship. Countries with stronger institutions may be better positioned to cope with the potential conflict and inefficiencies intrinsic in diversity. Easterly (2001) found that good institutions can help reduce the adverse effects of ethnic conflict. Alesina and La Ferrara (2005) reported that increases in ethnic diversity are associated with lower growth rates but that the interaction between diversity and income level is positive. They concluded that fractionalization has more negative effects at lower levels of income. The potential benefits of diversity are likely to be more relevant to advanced and complex societies. Highly developed countries may be better positioned to take advantage of the variety of skills and perspectives that come with a diverse populace. VanAlstine et al. (2013) reported that countries in the

bottom three quartiles of development are negatively affected by religious diversity, whereas countries in the top quartile of development are positively affected. The authors concluded that highly developed countries with strong institutions that protect personal and property rights are better positioned to mitigate the costs and to take advantage of the benefits of diversity.

MOTIVATION AND CONTRIBUTION

This paper extends the understanding of the relationship between diversity and human well-being in four ways. First, whereas many previous studies have utilized samples based on developing countries, this study focuses on the impact of cultural diversity in the United States. Countries with strong infrastructures and institutions, such as the Unites States, may be better positioned to handle the conflict and inefficiencies and to take advantage of the variety of skills and perspectives that come with higher levels of diversity. Because it is likely that institutional strength is relatively consistent across states, by using state-level data, we effectively control for the differences in institutional strength that are present in studies across countries.

Second, we use the Human Development Index (HDI) as a robust measure of societal prosperity. Previous studies primarily focused on measures of economic performance, such as growth in GDP per capita or a growth competitiveness index. Sen (1993) argued that human development is a process of expanding capabilities and choices. He encouraged a shift in focus from mechanical indicators of economic progress to indicators that come closer to reflecting the well-being and freedom enjoyed by populations. As an alternative to focusing only on productivity, the Human Development Index considers education, health, and income. These three components of HDI allow us to test whether diversity has a selective impact on society that might be missed using only productivity measures.

Third, we measure and consider three components of cultural diversity: ethnicity, language, and religion. The majority of previous studies have neglected one or more aspects, typically focusing on ethnic or ethno-linguistic differences. Loh and Harmon (2005) presented the first global measure of biocultural diversity, measured as the average of indices of diversity in ethnicity, language, and religion. In a cross-country analysis, DiRienzo et al. (2007) found that ethnic, linguistic, and religious diversity each has a different impact on a nation's level of competitiveness. VanAlstine et al. (2013) concluded that the negative relationship between cultural diversity and development is driven primarily by religious diversity. The three separate components of cultural diversity allow us to investigate whether certain elements of diversity are associated with higher or lower levels of social prosperity.

Fourth, virtually all previous studies have utilized one mathematical measure of diversity, though diversity of any kind can be measured in multiple ways. Budescu and Budescu (2012) demonstrated that the choice of diversity measure can affect the conclusions that can be drawn and limits the ability to compare and generalize results

across studies. In response, we utilize four mathematical measures for each component of diversity. Comparing our results across the four measures ensures that our results are robust and not dependent on the method of measurement.

DATA

Measures of Human Development

To broadly measure social prosperity by state (and the District of Columbia), we utilize the American Human Development Index (Lewis and Burd-Sharps 2013–2014). This composite HDI utilizes data primarily from 2010 and is calculated as the simple average of indices based on health, education, and income. Each index is scaled to range between 0 and 10 based on the minimum and maximum state values. Higher values reflect greater levels of well-being. The health index is based on life expectancy at birth. The education index is based on school attainment. The income index is based on median personal income. These data allow for separate investigation of the relationships between diversity and health, diversity and education, and diversity and income. In addition, the composite index allows for measurement of the broader impact of diversity on overall prosperity.

Components of Diversity

Similar to our measurement of human development, we use a composite measure of cultural diversity defined as the simple average of ethnic, language, and religious diversity. The data for ethnic diversity come from the U.S. Census Bureau (2010). For each state, we utilize the percentage of the following ethnic groups: White not Latino, Latino, African American, Asian American, Native American, and Other. The data for language diversity also comes from the U.S. Census Bureau (2010). For each state, we utilize the percentage of homes where the following categories represent the primary language spoken: English, Spanish, European, Asian, and Other.

The U.S. Census Bureau has been prevented by law and administrative rules from collecting even basic information on religious affiliation. As a result, the data for religion come from the U.S. Religious Landscape Survey (Pew Research 2008). For each state, we utilize the percentage of adults who associate with the following religions: Evangelical Protestant, Mainline Protestant, Historically Black Protestant, Catholic, Mormon, Orthodox, Jehovah's Witness, Jewish, Muslim, Buddhist, Hindu, and Other.

Mathematical Measures of Diversity

In our analysis, we utilize four mathematical measures of diversity for language, religion, and ethnicity. For consistency, all indices are defined so that higher values reflect greater diversity. The first measure is the percentage of the largest demographic group compared to the population (p_i) subtracted from one.

$$Proportion\ index = 1 - p_i \quad (1)$$

The maximum value is attained when the largest group is very small, implying a very large number of groups.

The second measure is the Shannon index, commonly used to measure species diversity in biology:

$$Shannon\ index = -\sum_{i=1}^{N} p_i \ln(p_i) \quad (2)$$

where p_i is the proportion of a state's population in demographic group *i* and *N* is the number of groups in the state. The maximum value is attained when all demographic groups have the same proportion.

The third mathematical measure utilizes the Simpson index, which measures the probability that two individuals drawn at random from a state will belong to the same demographic group. We calculate this measure of fractionalization as shown in Equation 3.

$$Simpson\ index = 1 - \sum_{i=1}^{N} p_i^2 \quad (3)$$

where p_i is again the proportion of a state's population in demographic group *i* and *N* is the number of groups in the state. The maximum value is attained when there are many small groups and no dominant group, reflecting more diversity.

The fourth measure of diversity reflects that polarized groups may be more likely to engage in conflict. Specifically, if a state has two dominant cultural groups, there may be more conflict than if the state has many equally sized groups. Montalvo and Reynal-Querol (2005) proposed a Polarization index calculated as shown in Equation 4.

$$Polarization\ index = 1 - \sum_{i=1}^{N} \left(\frac{\frac{1}{2} - p_i}{\frac{1}{2}} \right)^2 p_i \quad (4)$$

where p_i is the proportion of a state's population in demographic group *i* and *N* is the number of groups in the state. This index measures the normalized difference from a bimodal distribution, and it reaches a maximum when two equally sized groups dominate the demographic.

Control Variables

Control variables are included in our regressions to increase the likelihood that we are measuring the impact of diversity and not other extraneous factors. We control for differences in urban and rural areas between states by including the natural log of population density obtained from the U.S. Census Bureau (2010). In this study of the impact of diversity within the United States, institutional strength should be relatively similar between states. For completeness, however, we include a regulatory and

economic freedom index (Ruger and Sorens, 2010) to control for potential institutional or structural differences between states. We control for income inequality by using the Gini coefficient obtained from the 2010 American Community Survey. Zero represents total equality, and 1.0 represents maximal inequality. We also control for the percent of the population that is on government assistance, calculated as the sum of the number of individuals on welfare and food stamps divided by the state's total population (*New York Times* 2011).

Control variables that measure the proportion of two specific ethnic groups are also included to ensure that we are measuring the impact that diversity has on human development, as opposed to the impact that a large specific ethnic group may have. We include the percent of the population that is Latino and the percent of the population that is African American, as these are the two largest minority groups in the United States.

RESULTS

Our basic linear regression model used throughout the paper has the form shown in Equation 5.

$$Development = \alpha + \beta_x X + \beta_D D + \varepsilon \quad (5)$$

where X is a vector of control variables described above, D is a vector of diversity measures, α and β are the coefficients to be estimated, and ε is the error term. The method of ordinary least squares is used to estimate the coefficients in the model. VanAlstine et al. (2013) found evidence for a nonlinear relationship supporting the notion that strong institutions are necessary to mitigate the costs of diversity. We also estimated a nonlinear model for the relationship between diversity and development but found no significant evidence in support of this model. Our results support the notion that institutional strength is relatively consistent across all states within the United States.

Table 1 presents the results from the regression described in Equation 5 to estimate the impact that our composite measure of cultural diversity (calculated using the Proportion index) has on HDI and its three component indices of health, education, and income. For all four measures of human development, cultural diversity has a significant positive impact. The control variable, population density, is positively associated with each of the human development indices. This indicates that a higher level of human prosperity is found in urban areas. Consistent with expectations that institutional strength is similar between states, the regulatory and economic freedom index has no significant relationship with any of the development indices. The Gini coefficient, which represents income inequality, is also insignificant. The coefficient on percent of the population on government assistance is significantly negative for all four measures of human development. Not surprisingly, a state's overall level of human prosperity is negatively correlated with the proportion of the population on government assistance.

Table 1. Cultural Diversity (Composite Measure) in the United States and Four Measures of Human Development Using the Proportion Index

Independent Variable	Dependent Variable			
	HDI	Health Index	Education Index	Income Index
Cultural Diversity	3.975 (3.37)***	2.973 (2.37)**	3.178 (2.15)**	6.948 (3.65)***
Ln (Population Density)	0.233 (4.85)***	0.181 (3.54)***	0.235 (4.20)***	0.283 (3.65)***
Regulatory and Economic Freedom Index	0.001 (0.63)	–0.002 (–0.94)	0.001 (0.74)	0.000 (0.20)
Percent Latino	–0.031 (–3.06)***	–0.013 (–1.23)	–0.029 (–2.43)**	–0.051 (–3.12)***
Percent African American	–0.027 (–3.48)***	–0.044 (–5.39)***	–0.021 (–2.33)**	–0.015 (–1.24)
Gini Coefficient	5.166 (1.17)	–1.353 (–0.29)	7.729 (1.51)	9.121 (1.29)
Percent on Assistance	–0.090 (–5.34)***	–0.080 (–4.46)***	–0.083 (–4.23)***	–0.107 (–3.93)***
Constant	1.729 (0.91)	5.479 (2.72)***	1.107 (0.50)	–1.399 (–0.46)
Observations	51	51	51	51
Adjusted R-squared	.69	.72	.59	0.62

Notes: Diversity for each state measured using the proportion index, which is the percentage of people who are not members of the dominant language/religion/ethnicity.

*significant at the 10% level **significant at the 5% level ***significant at the 1% level

The percent Latino and percent African American variables have negative coefficients for all four human development indices. These results indicate that states with large populations of Latinos and African Americans are associated with lower human development outcomes, but when the percentages of these ethnic minorities are controlled for, increased levels of cultural diversity have a beneficial impact on human prosperity. Our results are essentially unchanged when the regressions are specified without the two ethnic control variables (not reported in our tables).

Tables 2 through 4 repeat this analysis using three alternative mathematical measures for our composite measure of cultural diversity. The results are very consistent with those presented in Table 1. The coefficient on cultural diversity is positive for all four measures of human development using all mathematical measures of diversity. All results are statistically significant except when the dependent variable is the education index. This means that in 13 of 16 regressions, the coefficient on cultural diversity is positive and significant. This is a particularly strong result, given that each of the four mathematical measures of diversity reflects clearly different interpretations of what is considered diverse.

Table 2. Cultural Diversity (Composite Measure) in the United States and Four Measures of Human Development Using the Shannon Index

Independent Variable	Dependent Variable			
	HDI	Health Index	Education Index	Income Index
Cultural Diversity	1.551 (3.48)***	1.034 (2.15)**	0.694 (1.32)	2.924 (4.19)***
Ln (Population Density)	0.211 (4.36)***	0.167 (3.19)**	0.226 (3.96)***	0.241 (3.17)***
Regulatory and Economic Freedom Index	–0.001 (–0.56)	–0.002 (–1.13)	0.001 (0.64)	0.000 (0.19)
Percent Latino	–0.028 (–3.03)***	–0.009 (–0.90)	–0.026 (–2.38)**	–0.048 (–3.39)***
Percent African American	–0.023 (–3.23)***	–0.041 (–5.26)***	–0.018 (–2.20)**	–0.010 (–0.89)
Gini Coefficient	3.115 (0.73)	–2.990 (–0.65)	6.622 (1.32)	5.712 (0.85)
Percent on Assistance	–0.081 (–4.67)***	–0.075 (–3.99)***	–0.080 (–3.89)***	–0.089 (–3.25)***
Constant	2.351 (1.30)	6.105 (3.11)***	1.534 (0.72)	–0.585 (–0.21)
Observations	51	51	51	51
Adjusted R-squared	.69	.72	.52	.64

Notes: Diversity measured for each state using the Shannon index, which is at a maximum value when all groups have the same proportion.

*significant at the 10% level **significant at the 5% level ***significant at the 1% level

Table 3. Cultural Diversity (Composite Measure) in the United States and Four Measures of Human Development Using the Simpson Index

Independent Variable	Dependent Variable			
	HDI	Health Index	Education Index	Income Index
Cultural Diversity	2.89 (2.53)**	2.294 (1.94)*	0.522 (0.403)	5.862 (3.25)***
Ln (Population Density)	0.227 (4.49)***	0.176 (3.36)***	0.237 (4.13)***	0.269 (3.37)***
Regulatory and Economic Freedom Index	–0.000 (–0.15)	–0.002 (–1.02)	0.001 (0.31)	0.000 (0.15)
Percent Latino	–0.029 (–2.45)**	–0.013 (–1.07)	–0.019 (–1.43)	–0.055 (–2.93)***
Percent African American	–0.023 (–2.94)***	–0.042 (–5.11)***	–0.016 (–1.77)*	–0.012 (–0.96)
Gini Coefficient	3.13 (0.69)	–2.818 (–0.60)	6.287 (1.23)	5.992 (0.83)
Percent on Assistance	–0.090 (–5.00)***	–0.079 (–4.276)***	–0.087 (–4.27)***	–0.103 (–3.64)***
Constant	2.659 (1.38)	6.100 (3.05)***	2.117 (0.97)	–0.240 (–0.79)
Observations	51	51	51	51
Adjusted R-squared	.65	.71	.50	.60

Notes: Diversity measured for each state using the Simpson index, calculated as one minus the probability that two individuals drawn at random will be from the same group.

*significant at the 10% level **significant at the 5% level ***significant at the 1% level

Tables 1 through 4 demonstrate that cultural diversity is positively associated with all measures of human development. In Tables 5 through 8, we examine how the specific components of cultural diversity affect human development.

Table 5 presents results similar to those shown in Table 1 (both use the proportion index to compute diversity), except that the three components of cultural diversity (ethnic, religious, and language diversity) are used as explanatory variables instead of the composite cultural variable. For all four measures of human development, language and religious diversity have a positive and significant coefficient. In contrast, ethnic diversity has a significantly negative coefficient for all human development measures except for the income index, which has a negative coefficient that is not significant.

Table 4. Cultural Diversity (Composite Measure) in the United States and Four Measures of Human Development Using the Polarization Index

Independent Variable	Dependent Variable			
	HDI	Health Index	Education Index	Income Index
Cultural Diversity	4.554 (4.17)***	2.746 (2.79)***	1.357 (1.23)	4.487 (2.80)***
Ln (Population Density)	0.213 (4.25)***	0.160 (3.13)***	0.226 (3.93)***	0.254 (3.05)***
Regulatory and Economic Freedom Index	–0.001 (–0.52)	–0.002 (–1.27)	0.001 (0.49)	–0.001 (–0.51)
Percent Latino	–0.045 (–2.77)***	–0.018 (–1.68)*	–0.027 (–2.19)**	–0.045 (–2.48)**
Percent African American	–0.007 (–3.06)***	–0.043 (–5.68)***	–0.019 (–2.18)**	–0.007 (–0.55)
Gini Coefficient	2.646 (0.60)	–3.070 (–0.69)	6.433 (1.28)	4.573 (0.63)
Percent on Assistance	–0.085 (–4.77)***	–0.073 (–4.02)***	–0.081 (–3.97)***	–0.102 (–3.44)***
Constant	2.579 (1.38)	5.746 (3.03)***	1.589 (0.59)	0.401 (0.13)
Observations	51	51	51	51
Adjusted R-squared	.67	.73	.52	.57

Notes: Diversity measured for each state using the polarization index, calculated as one minus the normalized difference from a bimodal distribution.

*significant at the 10% level **significant at the 5% level ***significant at the 1% level

Tables 6 through 8 repeat this analysis of the separate components of cultural diversity using the three alternative mathematical measures for diversity. The coefficient on language diversity remains positive and significant using all four mathematical measures of diversity. The coefficient on religious diversity remains positive with all four human development measures but loses its significance on two components when using the Shannon and Simpson indices. The coefficient on ethnic diversity remains negative for all four human development measures using all four mathematical measures, but it loses its significance whenever the income index is the dependent variable and when the polarization index is used as the measure of ethnic diversity.

Table 5. Cultural Diversity in the United States and Four Measures of Human Development Using the Proportion Index

Independent Variable	Dependent Variable			
	HDI	Health Index	Education Index	Income Index
Language Diversity	9.441 (4.17)***	9.104 (3.64)***	6.085 (2.18)**	13.135 (3.33)***
Religious Diversity	1.403 (2.82)***	0.911 (1.68)*	1.350 (2.20)**	1.947 (2.24)**
Ethnic Diversity	–1.949 (–2.20)**	–2.085 (–2.13)**	–2.306 (–2.11)**	–1.456 (–0.94)
Ln (Population Density)	0.147 (3.11)***	0.097 (1.85)*	0.172 (2.95)***	0.173 (2.10)**
Regulatory and Economic Freedom Index	0.002 (1.34)	0.000 (0.30)	0.002 (1.15)	0.003 (1.30)
Percent Latino	–0.059 (–4.40)***	–0.043 (–2.92)***	–0.041 (–2.45)**	–0.094 (–3.99)***
Percent African American	0.007 (0.68)	–0.011 (–0.96)	0.008 (0.59)	0.026 (1.36)
Gini Coefficient	1.330 (0.33)	–5.287 (–1.20)	5.569 (1.13)	3.708 (0.53)
Percent on Assistance	–0.074 (–4.89)***	–0.065 (–3.85)***	–0.072 (–3.85)***	–0.086 (–3.26)***
Constant	3.409 (1.93)*	7.280 (3.74)***	1.744 (0.80)	1.204 (0.39)
Observations	51	51	51	51
Adjusted R-squared	.76	.77	.60	.66

Notes: Diversity for each state measured using the proportion index, which is the percentage of people who are not members of the dominant language/religion/ethnicity.

*significant at the 10% level **significant at the 5% level ***significant at the 1% level

To evaluate the validity of the underlying assumptions of our linear regressions, we examined a correlation matrix of all the independent variables and analyzed graphs of the residual terms; however, we found no obvious patterns or evidence of problems with either multicollinearity or heteroskedasticity.

Table 6. Cultural Diversity in the United States and Four Measures of Human Development using the Shannon Index

Independent Variable	Dependent Variable			
	HDI	Health Index	Education Index	Income Index
Language Diversity	2.382 (5.29)***	2.296 (4.39)***	2.060 (3.70)***	2.789 (3.34)***
Religious Diversity	0.596 (1.80)*	0.164 (0.43)	0.533 (1.30)	1.090 (1.77)*
Ethnic Diversity	–1.120 (–3.34)***	–1.204 (–3.09)***	–1.514 (–3.66)***	–0.642 (–1.03)
Ln (Population Density)	0.119 (2.79)***	0.077 (1.55)	0.130 (2.47)**	0.150 (1.90)*
Regulatory and Economic Freedom Index	0.001 (0.84)	–0.001 (–0.53)	0.002 (1.51)	0.002 (0.68)
Percent Latino	–0.040 (–5.01)***	–0.023 (–2.44)**	–0.037 (–3.76)***	–0.061 (–4.07)***
Percent African American	0.004 (0.45)	–0.014 (–1.52)	0.009 (0.88)	0.016 (1.09)
Gini Coefficient	0.498 (0.14)	–6.169 (–1.50)	4.432 (1.01)	3.232 (0.49)
Percent on Assistance	–0.063 (–4.31)***	–0.056 (–3.28)***	–0.062 (–3.43)***	–0.071 (–2.62)**
Constant	3.496 (2.15)**	7.780 (4.11)***	2.250 (1.12)	0.459 (0.15)
Observations	51	51	51	51
Adjusted R-squared	.81	.83	.67	.68

Notes: Diversity measured for each state using the Shannon index, which is at a maximum value when all groups have the same proportion.

*significant at the 10% level **significant at the 5% level ***significant at the 1% level

Overall, the results are robust using four measures of diversity. Both language and religious diversity are consistently associated with positive human development outcomes, while ethnic diversity is consistently associated with negative human development. When we control for the two largest minority groups, our results indicate that this negative relationship is not limited to the influence of any one specific ethnic group.

Table 7. Cultural Diversity in the United States and Four Measures of Human Development Using the Simpson Index

Independent Variable	Dependent Variable			
	HDI	Health Index	Education Index	Income Index
Language Diversity	4.955 (3.94)***	5.028 (3.71)***	3.281 (2.14)**	6.555 (2.98)***
Religious Diversity	2.307 (2.18)**	1.366 (1.20)	2.116 (1.64)	3.440 (1.86)*
Ethnic Diversity	–1.819 (–2.44)**	–2.001 (–2.49)**	–2.216 (–2.44)**	–1.239 (–0.95)
Ln (Population Density)	0.139 (2.90)***	0.087 (1.68)	0.163 (2.79)***	0.167 (1.99)*
Regulatory and Economic Freedom Index	0.002 (1.12)	0.000 (0.21)	0.002 (1.14)	0.003 (1.00)
Percent Latino	–0.059 (–4.20)***	–0.046 (–3.03)***	–0.042 (–2.44)**	–0.090 (–3.63)***
Percent African American	0.008 (0.76)	–0.010 (–0.83)	0.010 (0.76)	0.024 (1.29)
Gini Coefficient	1.422 (0.36)	–5.114 (–1.20)	5.463 (1.13)	3.918 (0.57)
Percent on Assistance	–0.081 (–5.35)***	–0.071 (–4.31)***	–0.080 (–4.31)***	–0.093 (–3.50)***
Constant	2.838 (1.42)	7.059 (3.27)***	2.525 (2.19)**	0.024 (0.01)
Observations	51	51	51	51
Adjusted R-squared	.76	.78	.60	.65

Notes: Diversity measured for each state using the Simpson index, calculated as one minus the probability that two individuals drawn at random will be from the same group.

*significant at the 10% level **significant at the 5% level ***significant at the 1% level

Table 8. Cultural Diversity in the United States and Four Measures of Human Development Using the Polarization Index

Independent Variable	Dependent Variable			
	HDI	Health Index	Education Index	Income Index
Language Diversity	2.635 (3.65)***	2.21 (2.75)***	1.280 (1.50)	4.411 (3.38)***
Religious Diversity	1.875 (2.48)**	1.615 (1.91)*	2.397 (2.67)**	1.613 (1.18)
Ethnic Diversity	–1.061 (–1.71)*	–0.637 (–0.92)	–1.057 (–1.44)	–1.489 (–1.33)
Ln (Population Density)	0.120 (2.51)**	0.088 (1.65)	0.146 (2.57)**	0.126 (1.46)
Regulatory and Economic Freedom Index	0.000 (0.12)	–0.001 (–0.91)	0.001 (0.76)	0.000 (0.08)
Percent Latino	–0.034 (–3.18)***	–0.021 (–1.79)*	–0.023 (–1.83)*	–0.057 (–2.97)***
Percent African American	0.010 (1.02)	–0.018 (–1.55)	0.010 (0.83)	0.039 (2.09)**
Gini Coefficient	1.604 (0.43)	–3.873 (–0.93)	5.856 (1.33)	2.830 (0.68)
Percent on Assistance	–0.074 (–4.81)***	–0.064 (–3.74)***	–0.072 (–3.95)***	–0.085 (–3.08)***
Constant	2.918 (1.70)*	6.014 (3.14)***	0.881 (0.43)	1.859 (0.60)
Observations	51	51	51	51
Adjusted R-squared	.77	.77	.63	.64

Notes: Diversity measured for each state using the polarization index, calculated as one minus the normalized difference from a bimodal distribution.

*significant at the 10% level **significant at the 5% level ***significant at the 1% level

CONCLUSION

Whereas many previous studies have found a negative relationship between diversity and economic growth, others have reported a positive or mixed relationship or no relationship. We contribute to this literature by using state-level data from the United States that allow us to examine the trade-offs between the costs and benefits of diversity in the presence of consistently strong institutional infrastructure. We utilize a broad measure of human development including health, education, and income. We also disaggregate cultural diversity into separate components of ethnic, language, and religious diversity. Finally, we utilize four mathematical measures of diversity to ensure that our results are robust and not dependent on the method used to calculate diversity.

We find an overall positive relationship between cultural diversity and human development in the United States. This relationship is very robust and remains positive using four measures of human development and four mathematical measures of diversity. When we disaggregate cultural diversity into three components (ethnicity, language, and religion), we find that human development has a positive relationship with language and religious diversity but a negative relationship with ethnic diversity. Notably, the positive (and negative) impacts of diversity are observed in health outcomes, educational attainment, and income levels.

Our results are consistent with diversity generating potential benefits from a variety of experiences, ideas, and skills, as well as potential costs resulting from inefficiencies due to difficulty in communication, difference in preferences, and conflict between polarized groups. The strong positive relationship between human development and language diversity may reflect that individuals who predominantly speak a different language typically are recent entries into the United States and thus are more likely to contribute new ideas and to enhance creativity and innovation. Our results indicate that these benefits exceed any costs from barriers to communication. Similarly, the positive relationship between human development and religious diversity shows that the benefits from diverse religious perspectives are garnered without equal costs related to religious intolerance. In contrast, in the United States, the benefits from ethnic differences are exceeded by the associated costs from inefficiencies and potential conflicts.

These results call for comparison to the results from a similar study by VanAlstine et al. (2013), who found a predominately negative relationship between diversity and human development using international data. More specifically, they found that religious diversity drives this negative relationship. So, why is religious diversity generally negative internationally and positive in the United States, and why is ethnicity neutral internationally and negative in the United States?

The answer may be found in history and politics. Although internationally, there is a long history of wars based on religious differences, the United States was formed (at least in part) on the basis of religious freedom. While the United States continues to be very sensitive to religious freedoms (the Census Bureau is not allowed to ask about religion), it has been slower to adapt to ethnic/racial differences. Racial tension and

conflicts have been prominent throughout American history, from the Civil War to the race riots in the 1960s, to the high-profile controversies in 2015.

Our results also support the notion that strong institutions are required to mitigate the potential costs of diversity. When VanAlstine et al. (2013) considered only developed countries in the top quartile of their international study, they found that more religious diversity was associated with higher levels of development. They concluded that the stronger institutional protections in more developed countries allow the benefits of diversity to exceed the costs. Although the United States now has significant legal protections for ethnic-minority citizens, implementation of the laws and attitudes toward racial diversity continue to lag behind the respect for religious diversity.

Our study shows that cultural diversity is positively associated with human development in the United States and should be promoted; however, as discussed above, strong political and legal institutions may not be sufficient to extract net benefits from diversity if social attitudes that guide behavior are not supportive. In particular, if significant mistrust develops, there is greater likelihood of polarization and conflict between ethnic groups. Our results have implications for policies on race relations and immigration. If diversity is to be encouraged and accepted, strong institutional support is needed to ensure that the benefits can be extracted while mitigating the costs.

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