When More Democracy Means More Inequality: A Path Analysis

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Path analysis is used to examine an observed positive relationship between inequality and democracy. Specifically, the impact of democracy and corruption on inequality and per capita income is assessed based on a cross-sectional data set covering 125 countries. We show high inequality democracies are associated with elevated corruption, lower per capita income, and a ceiling on democratic achievement. We argue that democracy increasing in tandem with inequality is consistent with authoritarian leadership attempting to grow an economy for self-enrichment. We propose measures of democracy need to account for democratic policies whose actual aim may be the enrichment of elites.

Keywords: Democracy Index, Corruption Perceptions Index, Institutions, Path Analysis

INTRODUCTION

In this paper, we examine the interplay between democracy, corruption, inequality and income using cross-sectional data and path analysis. Our investigation is premised on the argument that institutions, the written and unwritten rules of the game, are the primary generators of wealth (North, 1990)[1]. In the context of national growth and development, Acemoglu and Robinson (2012) frame the institutional perspective as a tension between inclusive and extractive institutional arrangements (see also Acemoglu, Johnson, Robinson, & Yared, 2002). They describe inclusive political arrangements as tending to be pluralistic, and the economic institutional arrangements that spring from them (Sunde, Cervellati, & Fortunatod, 2008) as more likely to share prosperity broadly. For our purposes we consider "democracy" to be an inclusive institutional arrangement. In contrast, extractive institutional arrangements are structured to enable one segment of society to extract wealth from another segment. In our study we use a measure of corruption to account for extractive arrangements.

Critically, the mingling of inclusive and extractive institutional arrangements is unstable (Acemoglu and Robinson, 2012). One such example of the tension creating this instability is offered by You and Khagram (2005) who write "Whereas the rich have more motivation and capability to behave corruptly at higher levels of inequality, the non-rich have more to gain from combating corruption" (p. 139). Li, Squire, & Zou (1998) state that a wealthy minority can exercise its economic power through direct

political control or via actions like bribery, and that this power is constrained by the level of democracy that a country has achieved. Montinola and Jackman (2002) describe a "threshold" past which democracy is able to limit corruption.

We assume that where inclusive institutions characterized by a robust democracy dominate, people tend to weed out extractive institutions, rendering the society more and more pluralistic. Alternatively, where democracy is weaker, the beneficiaries of extractive arrangements see their self-interest threatened by inclusive institutions, and therefore these beneficiaries work to eliminate them. This push and pull is modeled theoretically by Acemoglu (2008).

Over time and across countries, Acemoglu and Robinson (2012) argue that where inclusive political and economic institutional arrangements predominate, people benefit from greater prosperity. Consequently, we assume that the overall institutional framework within a country, characterized by the relative dominance of inclusive (democratic) or extractive (corruption) institutional arrangements, is the fundamental determinant of the economic outcomes of inequality and income.

As an overview of this paper, we first establish a U-shaped relationship between democracy and inequality and develop a model to link these two measures to income. Then, we divide the analysis into low and high inequality groups in order to establish separate path diagram analyses for both groups. Finally, we introduce corruption as a factor whose influence on democracy changes between low and high inequality.

Our point of departure is depicted in Figure 1. Even with substantial variation, a curve-fitting exercise shows a statistically significant U-shaped relationship between the Gini Coefficient and a measure of country-level democracy (see below for a description of the data). Surprisingly, the democracy measure increases at high inequality. This observation leads us to ask why higher levels of democracy would be associated with greater inequality. In this paper, we use path analysis to better understand the shape of the trendline in Figure 1, and examine the implications for income.

FIGURE 1
COUNTRY LEVEL DEMOCRACY INDEX VERSUS GINI COEFFICIENT

Note: Democracy Index = 19.401 + 0.00735Gini^2*** - 0.648Gini***,
R^2*** = 0.123, * p<0.1, ** p<0.05, *** p<0.01

In the context of industrial and organizational psychology Billings and Wroten (1978) describe path analysis as "a technique that uses ordinary least squares regression to help the researcher test the consequences of proposed causal relationships among a set of variables" (p. 677). They argue that path analysis becomes useful when predictor variables become interrelated, a problem encountered often in development economics. Path analysis also helps us to avoid the challenges associated with the use of

instrumental variables that some have noted (Perotti, 1996; DiPrete and Gangl, 2004; Glaeser, La Porta, Lopez-de-silanes, & Shleifer, 2004).

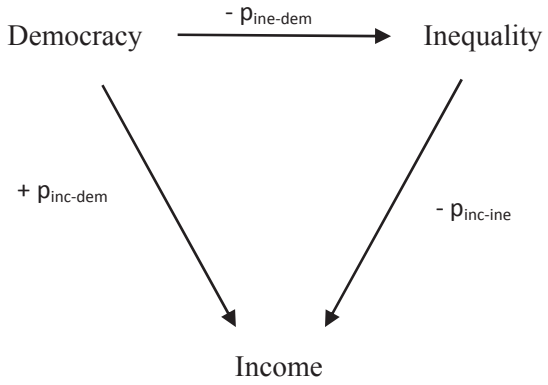
Stage, Carter, & Nora (2004) provide a review of path analysis in education research. They explain that the methodology requires the same set of assumptions as linear regression. They point out that a strength of path analysis is its ability to explicitly consider direct and indirect effects of a given explanatory variable on a dependent variable, and to test the validity of a given causal model (see also Nygreen, 1971) where the assigning of causality is left up to theory.

For examples of path analysis, Bedeian and Armenakis (1981) examine determinants of work-related behavior, Munro (1981) connects forces that affect high school dropout rates, and Roberts (2005) looks at the role that households play in rural economies. What follows is a description of the application of path analysis to the democracy-corruption framework described above.

THE MODEL

Central to path analysis are "path diagrams" that reflect the theory-driven causality researchers are assuming. We start with a path diagram showing income, democracy and inequality as variables, each connected by a pathway. The empirical relationships between the variables in Figure 2 are standardized partial regression coefficients or, "path coefficients," $p_{i\text{-}j}$. They estimate the link between dependent variable, i, and independent variable, j, in terms of standard deviations. Thus, the magnitude of the path coefficient estimates the relative importance of the variable (Li et al., 1998) conditional on the statistical significance of the coefficient.

FIGURE 2
PATH DIAGRAM OF THE DEMOCRACY – INEQUALITY – INCOME RELATIONSHIP



In Figure 2 the sign indicates the expected direction of this relationship. For the democracy to income channel, generally speaking, we take democracy to be an inclusive institutional arrangement that builds incomes. This is based on the analysis of the historical record by Acemoglu and Robinson (2012). Based on Muller (1988) who found that years of democratic experience reduced inequality we assign a negative sign to the democracy–inequality relationship. Our logic is that, through pluralistic policies, democracy puts downward pressure on income inequality. This is also supported indirectly by Gupta, Davoodi, & Alonso-Terme (2002) who examine a panel of countries and find a positive association between inequality and corruption. A related and well-developed counter argument is provided by You and Khagram (2005) who say that inequality causes corruption. For the purposes of our paper we emphasize the role that corruption plays in what these authors describe as "vicious circles" whereby corruption reinforces and widens existing inequality. Where democracy is relatively weak and corruption strong, without this reinforcement inequality would not widen.

Many studies have examined the link between inequality and income. Barro (2000) found that inequality slowed the economic growth of low-income countries and boosted the growth of wealthy countries, while Perotti (1996) found a positive association between equality and income growth, and Easterly (2007) links high structural inequality to underdevelopment. We predict that at some high level of inequality, additional inequality indicates a concentration of power, and thereby, an increasing likelihood that policy could sway resources away from their most productive uses and in favor of the very wealthy. This in turn acts to decrease overall per capita income. Therefore, we assign a negative sign to the inequality–income pathway, understanding that this contradicts the upward sloping branch of the trendline in Figure 1.

The resulting path diagram in Figure 2 provides for democracy to affect income through two channels; directly and indirectly via the inequality channel. Inequality only has a direct effect on income. Terms accounting for the unexplained portion of each variable are left out of the path diagram for simplicity.

DATA

Muller (1988) states that a challenge with cross-sectional studies like ours is small sample size. Oftentimes data for a given country is missing. Moreover, the problem of missing data disproportionately affects countries with ill-developed information infrastructure, for example, low income countries (Barro, 2000; Kuznets, 1955; Perotti, 1996). Therefore, in building our data set we sought to include as many countries as possible.

One way to maintain a large data set was to use averages rather than relying on single-year data observations. Li et al. (1998) used 5-year averages to maintain a more balanced data set, one that eliminates fewer countries due to limited data. They also state that these measures tend to be stable over time, and thus averages do not decrease information but may dampen short term fluctuations and allow us to focus on the structural relationships of interest. Looking at inequality and corruption across 129 countries, You and Khagram (2005) find that use of averaged data could increase or decrease the magnitude of regression coefficients, and they claim that averaged data helped to reduce an upward bias in some estimates.

Our measure of the prevalence of democratic institutions in a country is based on the Democracy Index (DI) presented by The Economist Intelligence Unit (2018). This index assesses a country's democracy on a scale of 0, for "authoritarian", up to 10, for "full democracy" (The Economist Intelligence Unit, 2018). It scores 165 independent states and 2 territories based on a composite of electoral process and pluralism, civil liberties, the functioning of government, political participation, and political culture. In our research, democracy is measured as the average of the annual estimated DI for each country between 2010 and 2017.

For country income, we use annual per capita gross national income (GNI/capita) calculated via the Atlas Method (The World Bank, 2018). Consequently, our income measure is reported in nominal US dollars. Alternative measures of income, for example, gross domestic product per capita, are closely correlated to GNI/capita, so we assume that the relative position of countries is reasonably consistent across income measures. Of the 217 locations in the data set, 33 were missing at least the GNI/capita for 2017. Moreover, consistent with Perotti (1996) we found that countries with limited data were disproportionately low income/high inequality countries. We calculated the average of any annual country GNI/capita data between 2010 and 2017. Thus, our country income data consists of the average of from 1 to 7 years of annual estimated GNI/capita for each country.

Our inequality data were also obtained from World Development Indicators (The World Bank, 2018). To correspond to the income data, we selected The World Bank estimated Gini coefficient for years 2010 to 2017 for all countries. As was the case with our GNI/capita measure, to maintain as large a data set as possible, we took the average of each country's annual Gini coefficient between 2010 and 2017, where some countries had only one available estimate. The DI and this inequality data were used to generate the scatter plot in Figure 1.

Corruption is defined by The World Bank as "the abuse of public power for private benefit" (Tanzi, 1998, p. 564, see also You and Khagram, 2005). Although it measures *perceptions of* corruption rather than actual corruption (Tanzi, 1998), Judge, McNatt, & Xu (2011) review measures of corruption and cite the "Corruption Perceptions Index" (CPI) presented by Transparency International (2018a) as among the most reliable and widely used (see also, You and Khagram, 2005). The CPI draws from multiple sources to assess public sector behavior such as bribery, use of public office for private gain, civil service nepotism, and prosecution of corrupt officials (Transparency International, 2018b) to assign a score of 0 to 100 for each country, where 100 represents a country with relatively little corruption. We maintain this scale while recognizing that the CPI is actually the inverse of corruption. Drawing from Sunde et al. (2008) and to maintain consistency with our earlier data, we take the average of each country's CPI scores between 2010 and 2017, noting that the CPI was revised in 2012 to increase comparability between years.

Combining the above four data sets gives us a cross section of 125 countries with democracy, GNI/capita, corruption and inequality estimates. This data set includes countries with tremendous differences in their governance and level of economic development allowing us to examine these variables across a wide range of values (Barro, 2000).

ANALYSIS

As a first step we look at a model that considers the variables in Figure 2. This allows us to present observations using a simplified framework. Then, we evaluate the more complex model with our corruption measure included, and evaluate the changes resulting from the introduction of this variable.

Step One: Democracy, Inequality, and Income at Low and High Inequality

Barro (2000) analyzes income growth as a function of inequality above and below a gross domestic product per capita of $2070 recognizing that the relationship can change depending on where a country is on the income continuum (see also Perotti 1996; Li et al. 1998). Meanwhile, Sunde et al. (2008) find a difference in growth-promoting institutions at high and low inequality, and Muller (1988) states that examining the link between economic development and inequality cannot be done with a monotonic function. With these arguments in mind, we observe that the trend line in Figure 1 is minimized at a Gini Coefficient of 44.08 so we divide our sample at this Gini coefficient. This results in 97 "low inequality" countries and 28 "high inequality" countries. This distribution of high and low inequality countries is robust to the presence of the rightmost data point in Figure 1. Working separately with each branch of the trend line in Figure 1 now calls for linear rather than quadratic regressions.

Table 1 is a correlation matrix of the variables in our model at low and high inequality. We see that going from low to high inequality the relationship between the DI and Gini coefficient has switched signs, and the association between the Gini coefficient and GNI/capita loses statistical significance. The relationship between the CPI and GNI/capita, and between the CPI and DI, both weaken but maintain their sign and statistical significance.

TABLE 1
PEARSON CORRELATION COEFFICIENTS

Variable	Gini Coefficient < 44.08 (n = 97)			Gini Coefficient > 44.08 (n = 28)		
	LN GNI/ capita	Gini Coef.	DI	LN GNI/ capita	Gini Coef.	DI
Gini Coef.	-0.386***	--	--	0.186	--	--
DI	0.789***	-0.366***	--	0.734***	0.323*	--
CPI	0.837***	-0.332***	0.849***	0.443**	0.216	0.543***

Note: * p<0.1, ** p<0.05, *** p<0.01

Table 2 presents results from the standardized regressions needed to generate path coefficients. The regression coefficients are used to assign values to the pathways in Figure 3. The Anderson-Darling test statistic (AD) is a test for normality of error terms where a significant result indicates that the errors are not normally distributed.

Figure 3 shows the path diagrams resulting from regressions 1, 2, 3, and 4 summarized in Table 2. When inequality is in the low range (Gini Coefficient < 44.08) Figure 3a shows that all the pathways demonstrate a statistically significant relationship, and the signs on the coefficients are as anticipated. We can check the agreement between our model and the data by summing the total of the direct and indirect effects and comparing these with the correlation matrix (Billings and Wroten, 1978). Put differently, the total observed relationship between any two variables is described empirically by the respective correlation coefficient in Table 1. If our path diagram is correct, then the sum of the direct and indirect effects should approximate this value very closely.

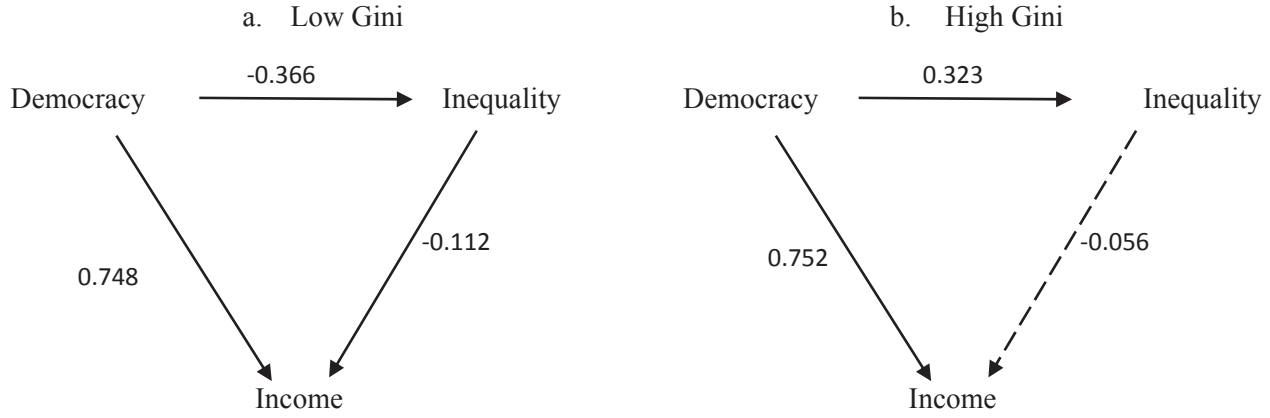
TABLE 2
REGRESSION SUMMARIES

Regression, Dependent Variable	Independent Variable Coefficients		R^2	AD
	DI	Gini		
1. Gini Coef. < 44.08, LN GNI/capita	0.748***	-0.112*	0.634***	1.31***
2. Gini Coef. < 44.08, Gini Coef.	-0.366***	--	0.134***	0.36
3. Gini Coef. > 44.08, LN GNI/capita	0.752***	-0.0562	0.541***	0.514
3a. Gini Coef. > 44.08, LN GNI/capita	0.734***	--	0.538***	0.530
4. Gini Coef. > 44.08, Gini Coef.	0.323*	--	0.104*	0.892**

Note: * p<0.1, ** p<0.05, *** p<0.01

At low inequality, the direct effect of democracy on income is 0.748 while the indirect effect is that portion of the coefficient linking inequality and income that can be attributed to democracy, or rather, the product of -0.366 and -0.112. Thus, democracy's total impact on income is: 0.748 + (-0.366 x -0.112) = 0.789. Similarly, we can attempt to reconstitute the correlation between inequality and income as follows: -0.112 + (-0.366 x 0.748) = -0.386. In both cases our model successfully reconstitutes the correlation coefficients in Table 1.

FIGURE 3
PATH DIAGRAMS



Note: Path Diagrams, Solid Arrows Indicate p-values of p<0.10

Looking at countries with a Gini coefficient greater than 44.08 depicted in Figure 3b, we follow the same procedure and reconstitute the correlation matrix with the total effects of democracy and inequality equaling 0.734, and 0.187 respectively; a very close match to the correlations in Table 1. In the case of high inequality, the relationship between democracy and inequality has become positive while inequality's effect on income is still negative but is no longer statistically significant, indicated in Figure 3b by a dashed arrow. Note that, although this pathway is not statistically significant, we use it to reconstitute the correlation coefficient because it is included in the regression model, and therefore, exerts influence over the other coefficients. We consider this lack of significance below.

While the ability of the model to reconstitute correlation coefficients provides a check of the path diagram's structure, this is relatively easy given the simplicity of the model and the fact that it is fully recursive (Alwin and Hauser, 1975). An additional check can be accomplished by comparing the explanatory power of our structural model with the observed R^2 value presented in Table 2. Given the assumed and observed relationship between democracy and inequality, Sokal and Rolf (1981) present the equation we use to calculate the explanatory power of our model as $R^2 = (p_{inc\text{-}dem})^2 + (p_{ine\text{-}dem})^2 + 2(p_{inc\text{-}dem} \times p_{inc\text{-}ine} \times p_{ine\text{-}dem})$. Applying this equation to Figure 3a results in an R^2 value of 0.633, a precise match of the observed R^2.

The hypothesis-testing ability of path analysis relates to the linkages that are present rather than the direction of causality. For example, if we were to propose that democracy and inequality were predictors of income but not related to each other, this would eliminate the pathway between democracy and inequality in our model. In this case, we could reconstitute the coefficient of determination as simply the sum of the squared path coefficients between each independent variable and income (Sokal and Rolf, 1981). This alternative structural model yields $R^2 = -0.112^2 + 0.748^2 = 0.572$ which deviates from the observed value of 0.634. Because the model that includes the democracy – inequality pathway reconstitutes the coefficient of determination more precisely for 3a we argue that the model as presented in Figure 3 is supported by the data.

We can examine the impact of the loss of statistical significance of the inequality – income pathway in Figure 3b by calculating the coefficient of determination based solely on the democracy – income pathway, a process called "theory trimming" (Billings and Wroten, 1978). This requires alternative regression 3a, presented in Table 2. Using the new coefficient on DI reconstitutes the new R^2 value of 0.538 precisely. The R^2 value we calculate using all variables from the original regression is nearly the same at 0.541 showing that the insignificant pathway has little effect on the explanatory power of the model. The difference between the coefficient on DI for regressions 3 and 3a, 0.734 versus 0.752, also implies that inequality plays a small role in this model.

Based on these checks, we accept the model as we have hypothesized. Our observation is that when inequality is relatively low, democracy boosts income directly and to a lesser extent indirectly through its ability to depress the observed negative influence of inequality on income. When inequality is in our high range, the possibility of democracy having the indirect positive effect on income via the inequality channel has disappeared. This has consequences for income that are presented below.

Given a Gini coefficient greater than 44.08, the loss of democracy's ability to depress inequality helps us understand the increasing inequality. However, the U-shape of the democracy-inequality relationship in Figure 1 implies that democracy and inequality increase in tandem at high inequality. We address the question of why increasing democracy is associated with increasing inequality by adding corruption to our model.

Step Two: Adding Corruption to the Mix

A statistically significant relationship between two variables can sometimes be spurious. For example, two variables may be acted on by a third variable (Billings and Wroten, 1978; Alwin and Hauser, 1975). The income – inequality relationship depicted in Figure 3a is a good example of such a relationship. The path diagram shows that much of this relationship is due to the shared influence of democracy. With this in mind, we consider the possibility that corruption, as measured by the CPI, may be acting on both democracy and inequality. Our working hypothesis is that at high inequality, corruption

acting on inequality (Tanzi, 1998) and democracy can generate the positive democracy – inequality relationship observed in Figure 1.

Underlying this hypothesis is the adversarial nature of inclusive (democracy) and extractive (corruption) institutional arrangements discussed above. Li et al. (1998) assume that civil liberties, an element of the DI, constrain the ability of the wealthy elite to influence policy. This contention is also supported by Table 1 where we see that the DI and CPI are significantly and positively related. Our model accounts for this tension between democracy and corruption through the assigning of causality as described below.

Table 3 indicates that, based on t-tests of the difference between sample means, in countries with a Gini coefficient less than 44.08, the CPI and GNI/capita are higher than in countries with a Gini coefficient more than 44.08. Recalling that the CPI scores countries with high corruption as closer to a "0", this implies that higher inequality is associated with a higher level of corruption. Meanwhile, the absence of a significant difference in the democracy score at low and high inequality is expected given the democracy – inequality relationship depicted in Figure 1. Thus, we observe greater corruption at higher inequality, but not a decrease in the level of democracy. This is a key point that we will return to. Lastly, in tandem with Table 1, we observe that higher levels of corruption (a lower CPI score) are associated with a weaker and less negative relationship between inequality and corruption. Our interpretation of this is that at high inequality, corruption begins to dominate democracy and consequently its inequality mitigating effects.

TABLE 3
SUMMARY STATISTICS OF VARIABLES AT LOW AND HIGH INEQUALITY

Variable	Average (Standard Deviation)	
	Gini Coefficient < 44.08	Gini Coefficient > 44.08
CPI Score	45[a] (20.6)	35.0[b] (10.9)
GNI/Capita	$15,778[a] ($20,811)	$4,129[b] ($3,767)
Democracy Index	5.91[a] (2.17)	5.58[a] (1.63)

Note: Values in the same row with the different superscript are statistically different, [ad] p<0.1, [ac] p<0.05, [ab] p<0.01.

Incorporating the CPI into each of the path diagrams presented in Figure 4 required three regressions: 1) GNI/capita regressed on the DI, CPI and Gini Coefficient, 2) the Gini Coefficient regressed on the DI and CPI, and 3) the CPI regressed on the DI or vice versa based on causality. The results of these regressions are summarized in Table 4.

TABLE 4
REGRESSION SUMMARIES

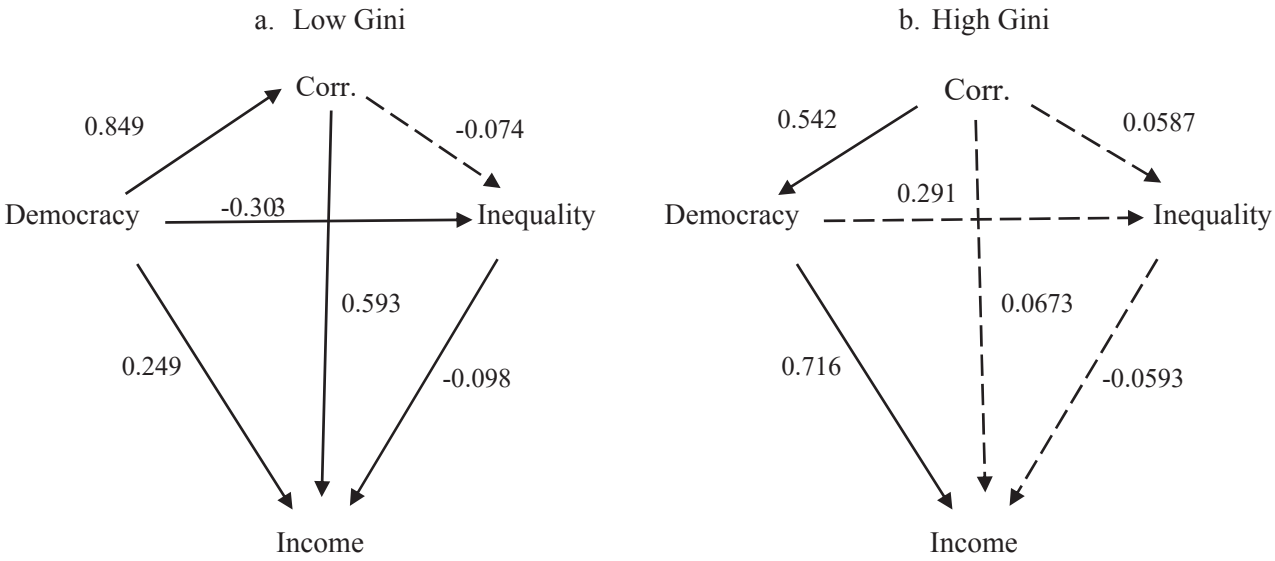
Regression, Dependent Variable	Independent Variables			R^2	AD
	DI	CPI	Gini		
6. Gini Coef. < 44.08, LN GNI/Capita	0.249**	0.593***	-0.098*	0.731***	0.718
7. Gini Coef. < 44.08, Gini Coefficient	-0.303*	-0.074	--	0.136***	0.347
7a. Gini Coef. < 44.08, Gini Coefficient	-0.366*	--	--	0.134***	0.316
8. Gini Coef. < 44.08, CPI	0.849***	--	--	0.721***	0.353
9. Gini Coef. > 44.08, LN GNI/Capita	0.716***	0.0673	-0.0593	0.544***	0.481
9a. Gini Coef. > 44.08, LN GNI/Capita	0.734***	--	--	0.538***	0.530
10. Gini Coef. > 44.08, Gini Coefficient	0.291	0.0587	--	0.106	0.879**
10a. Gini Coef. > 44.08, Gini Coefficient	0.323*	--	--	0.104*	0.892**
10b. Gini Coef. > 44.08, Gini Coefficient	--	0.216	--	0.047	0.969**
11. Gini Coef. > 44.08, DI	--	0.542***	--	0.295***	1.223***

Note: * p<0.1, ** p<0.05, *** p<0.01

Causality between democracy and corruption is assigned based the arguments of Acemoglu and Robinson (2012) who contend that inclusive institutional arrangements such as those pertaining to democracy are antagonistic towards extractive institutions like those characterized by corrupt arrangements. Thus, where democratic institutions are prevailing, we assume that democratic arrangements drive corruption down resulting in the causality arrow running from democracy to corruption. Alternatively, when democratic institutions are relatively weak, as evidenced by the lower CPI score in Table 3, the causality arrow runs from corruption to democracy, as corruption is working to curtail the reach of democratic institutions. Figure 4 presents path diagrams, with opposite causalities between democracy and corruption, using the coefficients from regressions 6, 7, 8, 9, 10, and 11 from Table 4.

Given the addition of the corruption, reconstituting the correlation coefficients requires additional terms. For example, democracy now has a direct effect on income and three indirect effects—via corruption, via inequality, and via the corruption – inequality channels. As was done for the simple model in Figure 3, summing the direct and indirect effects of our predictor variables on income reconstitutes the correlation coefficients between income and our three predictor variables quite closely for both path diagrams.

FIGURE 4
PRELIMINARY PATH DIAGRAMS INCORPORATING CPI



Note: solid arrows indicate p-values of p<0.10

Were we to examine only the coefficients generated by regression 6, we would conclude that the role of democracy is less important than that of the corruption variable. However, considering the structure of the path diagram, and accounting for the indirect effects of democracy acting through the corruption and inequality channels, indicates that democracy actually plays a major role.

Of the predictor variables, inequality is a special case since it is partly determined by two other predictor variables. This introduces an alternative pathway to income and an interesting observation for this variable. In the low inequality case, the correlation coefficient between inequality and income can be reconstituted by summing the direct and three indirect effects where one of these indirect effects is the chain: inequality – corruption – democracy – income or alternatively, inequality – democracy – corruption – income. Calculating the former, we get -0.098 + (-0.074 x 0.593) + (-0.303 x 0.249) + (-0.074 x 0.849 x 0.249) = -0.2331. This differs substantially from the observed correlation coefficient of

-0.386. The alternative indirect pathway reconstitutes the correlation coefficient between inequality and income more precisely as -0.370, which falls within the ad hoc limit of 0.05 described elsewhere (Billings and Wroten, 1978, citing Kerlinger and Pedhazur, 1973). Therefore, we assume this is the correct alternative and note that this agrees with the model as structured.

In the case of high inequality this disparity between alternative pathways from inequality to income disappears. Specifically, following the inequality – corruption – democracy – income channel we calculate 0.176 while the alternative pathway generates 0.162. The observed correlation coefficient is 0.186 (Table 1), however, it is difficult to use this information given the lack of statistical significance in the inequality to income correlation coefficient and multiple causal pathways.

Examining the explanatory power of the structural model depicted in Figure 4 requires that we account for the lack of statistical significance in multiple pathways. To correctly recalculate the R^2 value, we used the "theory trimming" approach as above. For Figure 4a, we regressed the Gini coefficient on democracy alone to allow the coefficient on democracy and the resulting R^2 to adjust (regression 7a in Table 4). For this set of variables reconstituting R^2 is simply the square of the coefficient on democracy which is a match.

For Figure 4b eliminating nonsignificant pathways calls for a regression of GNI/capita on democracy alone (regression 9a in Table 4). Squaring the resulting coefficient on democracy reconstitutes the R^2 value precisely.

Seeking to clarify the influence of democracy and corruption on inequality, we regressed inequality individually on each of these variables. Because these regressions are exploratory rather than theory-based, we need to interpret them carefully (regressions 10a and 10b in Table 4). Based on the relative changes of the R^2 values and the coefficients on the variables, as well as the statistical significance of the regressions, when the Gini coefficient is greater than 44.08, we observe a positive relationship between democracy and inequality.

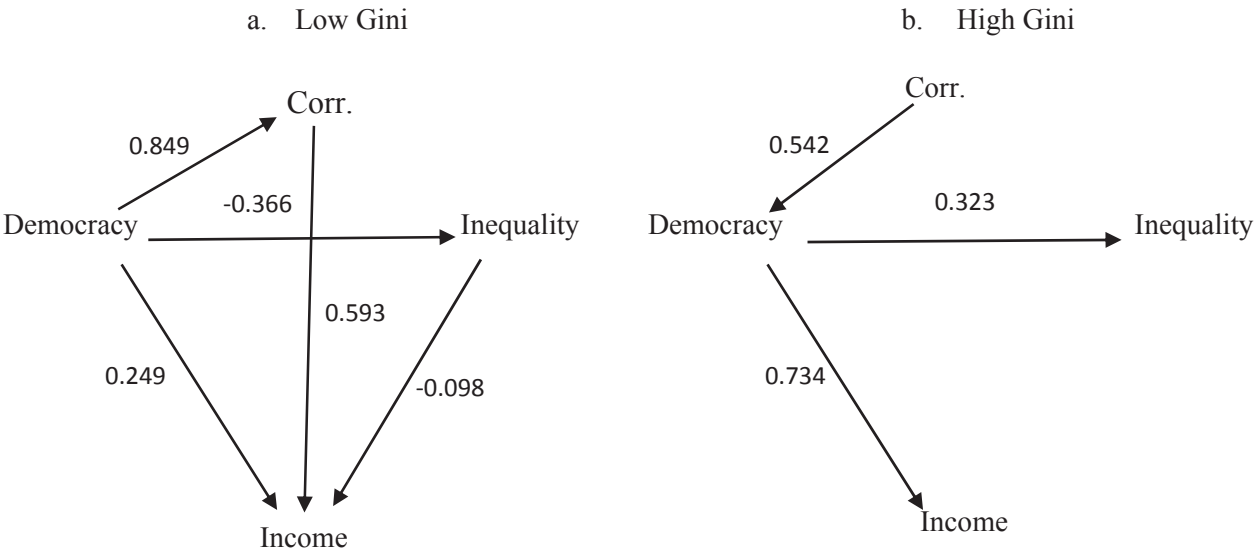
DISCUSSION: WHEN DEMOCRACY INCREASES INEQUALITY

This cross-sectional analysis of 125 countries paints a picture of two worlds. In the world where inequality is a decreasing function of democracy, we see higher incomes, and lower corruption. In this world, democracy boosts incomes directly and also indirectly by depressing corruption and inequality. In contrast, where inequality is an increasing function of democracy, we observe lower incomes, greater corruption, and a more constrained income-building role for democracy. In this section we use the information above to explore the circumstances under which democracy is positively associated with inequality.

Figure 5 incorporates coefficients from the alternative regressions described above and eliminates non-significant pathways. Figure 5b indicates that at high inequality, there is no significant pathway between corruption and income, and the importance of democracy's direct effect grows substantially relative to the low inequality case depicted in Figure 5a. Also, it is important to note that moving from low to high inequality, we see that the association between democracy and inequality switches from negative to positive. This final point brings us back to our original question—why would inequality be an increasing function of the estimated level of democracy in high inequality countries?

One possibility relates to the exercise of political or economic power. Glaeser, et al. (2004) examine the causes of economic growth and propose that one way a poor country can increase incomes is through good policies chosen by dictators. They argue, however, that there is an important difference between a dictator who chooses a growth-oriented policy and a policymaker in a democracy who is constrained to make a similar choice. Using Polity IV as their measure of democracy they note that both actions could be reflected by an increase in the country's democracy score despite the fact that the former was a choice while the latter was the result of constraints on governance. They point out that when the policy is a choice it represents a political outcome rather than an actual constraint.

FIGURE 5
FINAL PATH DIAGRAMS



Note: solid arrows indicate p-values of $p<0.10$

Similarly, Montinola and Jackman (2002) argue from a public choice perspective, and find that between dictatorships and intermediate democracies, there is less competition for voters and therefore less corruption, in dictatorships. They note that this effect does not carry into countries with greater democratization. To the extent that less corruption is associated with greater democracy, this work implies a positive relationship between the strength of a dictatorship and level of democracy up to intermediate democracies.

An alternative explanation relates high inequality and a high level of democracy. Muller (1988) presents evidence from a cross-section of 55 countries that leads him to discriminate between "level of democracy" and "years of democratic experience". He argues that the effect of democracy on inequality is not immediate, but rather, that democratic institutions reduce income inequality over time. He finds that how long a country spends under democracy is strongly and negatively correlated with income inequality, while level of democracy is not. Thus, a newly democratic country could have a high level of democracy but still exhibit a high Gini coefficient.

For Muller's argument to support the positive association between the level of democracy and inequality above a Gini coefficient of 44.08 that we observe, the level of initial democracy would have to be an increasing function of inequality. It is possible that a country with very high inequality would adopt a high level of democratic institutions in response, however, this seems unlikely. We assume that greater inequality would be associated with a greater concentration of power. In the face of an increasingly powerful elite the initial level of democracy is likely to be a negative, rather than positive, function of inequality.

Meanwhile, Table 4 indicates that high inequality is related to a higher level of corruption and essentially the same level of democracy as we observe at low inequality. This could describe a context where powerful elites were able to increase their own wealth by choosing policies that boost overall economic growth (You and Khagram, 2005; see also Li et al. 1998). The outcome of this policy approach may be consistent with an increase in the democracy index accompanying an increase in inequality. This also agrees with Sunde et al. (2008) who find that, although low-inequality democracies are more likely to implement rule of law, a rich elite may be able to implement rule of law, an element of the Democracy

Index (The Economist Intelligence Unit, 2018), presumably for self-enrichment, when inequality is high.

With Glaeser et al. (2004) in mind, and given higher corruption at high inequality, we propose that powerful elites pull democratic policy levers for self-enrichment. Measures like the Democracy Index may tend to tally such policies as an advance of democratic institutions, when in actuality the policies funnel wealth to elites, and thereby, increase inequality. To note is that our data do not indicate that elites could continue this sort of behavior to a point where those countries would be considered "Full Democracies". Rather, in reference to Figure 1, we observe that of the countries with Gini coefficients greater than 44.08, there is only 1 (3.6%) country with a DI score greater than 8, while in countries with a Gini coefficient less than 44.08 there are 19 (19.6%). Thus, we see a ceiling on the extent of democracy at high inequality. Similarly, Montinola and Jackman (2002) find a threshold beyond which democracy lowers corruption.

The path diagrams also provide evidence. Comparing Figures 3 and 5 we see that when corruption is introduced into the model, at low inequality the coefficient assigned to the democracy – income pathway decreases. This implies that there are substantial income-increasing effects of democracy due to democracy's ability to limit corruption. Stated differently, when corruption is in the model, democracy's impact on income via corruption mitigation can flow through the corruption – income channel, thus decreasing the coefficient on democracy (Alwin and Hauser, 1975). Conversely, at high inequality the coefficient assigned to the democracy – income pathway changes little when corruption enters the model. Given the observed increase in corruption at high inequality, we surmise that in these countries more corrupt institutional arrangements tend to prevail. Consequently, the ability of democratic institutions to boost income via corruption mitigation is stymied by the relatively stronger corrupt institutions. This is consistent with an elite able to institute democratic policies that disproportionately funnel benefits to themselves.

CONCLUSIONS

If interpreted correctly, cross-sectional analysis like this one can shed light on how key variables behave across a broad framework. For example, along a continuum of inequality ranging from very low to very high we see how the interplay of democracy and corruption impacts incomes. We argue that an observed positive relationship between inequality and democracy is in part the result of powerful elites pursuing democratic-leaning policies for self-enrichment, and that this has consequences for the development process.

For example, we note that across all levels of inequality, democracy and income are positively related. This is consistent with Glaeser et al. (2004) who argue that countries can escape poverty through policies enacted by dictators. However, including a measure of inequality in our analysis leads us to urge caution. We show that increases to democracy, given high-inequality and elevated corruption, entail the economic penalty of significantly lower GNI/capita. Consequently, what may matter is not whether or not a given institutional reform is more "democratic" in general, but rather how the reform is likely to impact inequality and corruption. With this in mind, it may be useful to refine measures like the Democracy Index to account for the policies that seem to enhance democratic institutions, but actually increase inequality and boost the wealth of elites.

It is important to note that it would be a mistake to conclude from our study that countries are likely to follow a given route along the democracy-inequality curve depicted in Figure 1. Our work addresses neither how a given country arrived at its position on the democracy-inequality continuum, why democracy or corruption may dominate, nor what a country's future development path may be. For example, research has shown that controlling for country-level fixed-effects can reduce or even eliminate the power of cross-sectional data to predict a path forward (Acemoglu Johnson, Robinson, &Yared, 2008; Li et al., 1998). Our study is not a substitute for these studies, but rather adds context and insight to country-level and panel studies.

Lastly, path analysis provided us with key insights in this analysis. For example, comparing path diagrams with and without the corruption variable helped to identify the role played by democracy in building incomes. However, there are also limitations. Perhaps the most critical weakness of this tool was the need to maintain a simple and limited set of independent variables. It was difficult to meet this need while fully satisfying the assumptions of linear regression. Transforming the income measure to its natural logarithm improved the performance of the regressions, but visual examinations of the residuals and Anderson-Darling Tests of normality of residuals presented in Tables 2 and 4 indicated that the regressions still fell short in numerous cases. We considered other transformations, such as including squared variables or interaction terms in the regressions, but found that these make interpretation exceedingly difficult, a challenge that has been noted elsewhere (Billings and Wroten, 1978; Alwin and Hauser, 1975). Research into alleviating this limitation could increase the statistical significance of additional channels, for example in Figures 3b and 5b, perhaps generating additional information.

ENDNOTE

1. We acknowledge that the contention institutions are the most basic driver of economic outcomes has detractors. For example, Glaeser, La Porta, Lopez-de-silanes, & Shleifer (2004), one of our primary sources, state that human capital is a more fundamental source of economic growth than institutions. Our response to this recalls our definition of institution as the written and unwritten rules of the game. Given this definition, the argument by Glaeser et al. requires that the accumulation of human capital they speak of is not the result of prior institutions. We think that the opposite is more plausible--the written and unwritten rules and norms of a society are more likely to generate human capital accumulation, than to be generated by human capital that arose from some other source. For example, in their article, Glaeser et al. argue that initial level of schooling has predictive power over ensuing institutional development, while the converse is not true, namely that initial level of institutional development has no predictive power over growth in years of schooling (p. 296). However, both sets of regressions control for per capita GDP. Where initial institutions are shown to lack predictive power over growth in education, per capita GDP does. Might this initial per capita GDP be the result of preceding institutional arrangements rather than initial schooling?

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