

Life May Be Unfair, But Do Democracies Make It Any Less Burdensome?

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Abstract

Using a large panel of countries, this paper studies whether, or not, democracies can disproportionately produce better economic outcomes for the poor than non-democracies. To deal with the endogeneity of democracy and inequality, a regional democratisation wave is used to isolate the exogenous variation in country-level democracy. Our main finding is that the exogenous component of democracy significantly and robustly decreased inequality, after controlling for key inequality determinants. We identify that two potential mechanisms through which democracy affects inequality are structural transformation and middle-class bias channels.

Key words: Democracy, Inequality

JEL: P16, O10

1. Introduction

"Why are we so rich and they so poor?" asks David Landes in 1990. It is nearly 30 years since the kick-off of the immense concerted international effort to solve this most lingering and intractable of questions facing humanity, spearheaded by the United Nations (UN), when it made the eradication of extreme poverty and hunger number one on its list of eight Millennium Development Goals (MDGs). One of the merits of such global coordination to cure poverty is that the world awoke to the question: What can we do to lift David Collier's bottom billion from hunger, ill-health, and other unwanted socio-economic inclusions? (Sen 1999; Collier 2007). According to the Millennium Development Goals Report (UN 2015), over 50% of the developing world's population lived on less than \$1.25 a day in 1990. The corresponding share in 2015 is 14%. If one looks at both developed and developing countries' populations together, 836 million people are classed as living in extreme poverty in 2015. In 1990, this number was 1.9 billion people.¹

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¹It is, of course, highly improbable that the real value of \$1.25 a day in 1990 is equivalent to that of 2015. While such consideration is beyond the scope of the current investigation, profound achievements resulting from this unprecedented

With the MDGs concentrating mainly on absolute income (i.e., poverty headcount), many scholars raised concerns that more should be done about relative income (inequality). As an example, Doyle and Stiglitz (2014) proposed that, *Eliminate extreme inequality at the national level in every country*, should be added as "Goal Nine" to the original list of eight MDGs. This is important because of the many dimensions of inequality and what the aftermath of leaving it growing unchecked may entail (Milanovic 2005, 2016; Rajan 2011; Galbraith 2012; Deaton 2013; Stiglitz 2013, 2015; Piketty 2014). Indeed, modern academic work into the causes and consequences of inequality dates back to at least the 1950s, when Kuznets (1955) observed that, for a developed country, there was an increase in inequality in the initial stages of development, which was later followed by a decrease in inequality as the economy entered into the latter stages of development. The inverted U-shaped curve that emerged from his studies has become one of the most-investigated ideas in the economics literature, albeit there is no consensus on the outcome. So, the query of whether inequality causes or is a consequence of growth remains an open contestation (Ferreira, Lakner, Lugo, and Ozler 2018).

Our focus in this paper, however, is on what causes inequality (and not what inequality causes).² Of the possible determinants, we investigate the impact of democratic institutions on differences in economic outcomes, as reviewed in part by Sirowy and Inkeles (1990), and recently reiterated by McCarty and Pontusson (2011) and Doyle and Stiglitz (2014). We join in this debate because there remains substantial room to add to the analysis of the inequality effects of democracy, especially that of establishing a causal association. Moreover, another interesting observation since the inception of the MDGs is that the world has experienced an unparalleled mono-directional transition from different shades of autocracy to different forms of democracy (Papaioannou and Siourounis 2008; Acemoglu, Naidu, Restrepo, and Robinson 2019). Thus, as invaluable as advocating access to universal primary education, promoting gender equality, and providing the required financial aid (to mention but a few) may be as strategic interventions for reducing poverty and inequality, one is led to surmise that the large-scale movements

worldwide effort include that the number of people in the working middle class (i.e., those living on more than \$4 a day) has nearly tripled over the same period.

²For the consequences of inequality, particularly on growth and its sources, there exists a substantial body of work—theoretical and empirical—in the social science literature. See, for example, excellent reviews by Aghion, Caroli, and Garcia-Penalosa (1999), Bertola (2000), and Voitchovsky (2009), with empirical evidence provided based on differences in each class of models (e.g., Deininger and Squire (1998) for imperfect capital model, Alesina and Rodrik (1994) and Persson and Tabellini (1994) for political economy models of redistribution, Alesina and Perotti (1996) and Rodrik (1999) for socio-political conflict model, and Keefer and Knack (2002) and Easterly, Ritzgen, and Woolcock (2006) for models of democratisation). For the effects of economic inequality on democratic outcomes, see, for example, Muller (1995), Rueschemeyer (2004), Savoia, Easaw, and McKay (2009), Houle (2009), and Haggard and Kaufman (2012).

towards democratic rule in many countries may have made a pervading contribution. This is consistent with the rationale given in the review by McCarty and Pontusson (2011, p. 665), who noted that: "purely economic explanations are unlikely to account fully for cross-sectional variation in levels and trajectories of inequality..." Similarly, Doyle and Stiglitz (2014, p. 7) summarise this as follows: "The marked differences in the extent and nature of inequality across countries demonstrate that inequality is not just determined by economic forces; it is shaped by politics and policies."

Therefore, we pose the following question: How seriously did we take the political environment in which the MDGs were expected to be achieved? The outcome of an investigation in this manner should be informative in devising institutional strategies on which may hinge the possibility of achieving the targets of the Sustainable Development Goals (SDGs) by 2030, particularly of Goal 10: *Reduce inequality within and among countries*. Thus, to speak to this issue, we re-evaluate the effect of democracy on inequality more systematically. We have two reasons for doing this. (1) In summarizing their review of both the theoretical and empirical literature on the democracy-inequality nexus, which covers the period 1959 to 1988, Sirowy and Inkeles (1990, p. 151) conclude that: "the existing evidence suggests that the level of political democracy as measured at one point in time tends not to be widely associated with lower levels of income inequality." They go on to conclude that: "much empirical work remains to be done" (p. 151). (2) An additional impetus is given by Acemoglu, Naidu, Restrepo, and Robinson (2015), who, in their insightful chapter in the *Handbook of Income Distribution*, conclude: "Our results suggest the need for a more systematic investigation of the conditions under which democracy does indeed reduce inequality and increase redistribution" (p. 1890).³

Hence, we are intently reconsidering the inequality effect of the political and institutional developments of the 50 years between 1960 and 2010. Meanwhile, many of the research studies in the early stages of investigating the link between democracy and inequality—some of which were reviewed by Sirowy and Inkeles (1990)—focussed on cross-sectional regression analysis. Apart from this, most researchers had to work with a lower quality of data and a smaller sample of countries than we can avail ourselves of today (Cramer 2005; Ahlquist and Wibbels 2012). Besides, a lot of the initial studies were

³Our focus in this paper is on the first relationship: democracy and inequality. In a companion paper to this one, (Oyekola *in progress*), we centre on the other relationship between democracy and redistribution, thereby investigating the connection between democracy and redistribution in a sample of 118 countries for the period 1960 through 2015. Our premise is: If the market promises equality of opportunity, but produces inequality of outcome, is a political democracy more likely to implement appropriate redistributive policies? Our preliminary results are not always affirmative of the role of democracy.

constrained with regards to the time-dimension they could explore even when they attempted to carry out panel data analysis. Reassuringly, advances in the state of empirical research and improvements in the quality of data available for our paper’s objective have, to a great extent, resolved these issues for us.

A major concern remains, however, with the prior literature failing to find a definitive way to deal with the possibility that omitted variables might be affecting both democracy and inequality. Further, while we examine the effect of democracy on inequality, another possibility is that inequality may be a factor driving democracy (e.g., Muller 1988). This has been shown in the prior literature in various forms. As an example, given that growth is good for the poor (Dollar and Kraay 2002), the threat of an adverse economic outcome (Sen 1981, 1999; Bruckner and Ciccone 2011) has political consequences, which may trigger a democratic change.

We confront these problems by identifying an exogenous source of variation in democracy in order to assess its effect on inequality. In order to instrument for democracy, we defer to the prior literature and exploit Acemoglu, Naidu, Restrepo, and Robinson’s (2019) recently constructed regional waves of democratisation and transitions to non-democracy. This variable is defined as the mean of democracy in a region multiplied by the initial regime cell, while leaving out own-country, and has been shown by these authors to be a strong instrument for the level of democracy in a country. In the context of our study, we have likewise confirmed this by reporting standard specification tests (e.g., Kleibergen-Paap and Stock-Yogo tests).

Our main contribution in this paper derives from this two-stage least squares (TSLS) regressions, such that we have been able to go beyond just providing evidence of a non-negligible reduction in inequality following the adoption of democracy as a form of government or improvements in democratic practices of countries around the world. Besides, we show that a rise in the level of democracy fosters institutional context that leads to a significant fall in the level of inequality. The results are conclusive: more democratic rights do negatively affect income inequality. This effect is both statistically and economically significant. More specifically, controlling for income growth, schooling, openness, financial development, inflation, government size, and region and time effects, we obtain a coefficient (standard error) of -5.94 (3.00), which is statistically significant at the 5% level. Economically, this implies that democracy accounts for 15% of the mean of our inequality measure (Gini coefficient) and 39% of its sample median.

Then, as in Brueckner, Dabla-Norris, and Gradstein (2015), we also separately pay attention to income quintiles. The resulting estimates of the effects of a rise in the level of democracy are that: (1) the relative income shares of the first to fourth quintiles rise, and (2) the relative income share of the fifth quintile falls. The results, therefore, show that democracy significantly and disproportionately boosts incomes of folks at the lower end of the income distribution, thereby reducing income inequality. However, given that the positive effect of democracy on the first quintile is never statistically significant at standard levels, we opine that this reinforces the notion of Director’s law of public expenditures that the middle class tends to redistribute from the wealthiest and poorest groups within a society to itself (Stigler 1970).

We next assess and confirm that the above results are robust across time and country heterogeneities, to excluding atypical observations, to accounting for time dimension, to employing alternative measures of inequality and democracy (including disaggregating our composite democracy measure into its component indicators), to alternative definitions of the regional democratisation wave instrument, and to entering additional control variables. Finally, we examine how democracy influences inequality by reconsidering the channels outlined by Acemoglu, Naidu, Restrepo, and Robinson (2015). These authors argue that whether or not democracy affects inequality depends on three potential channels, namely: captured democracy, structural transformation, and the middle-class bias. We represent captured democracy by land Gini and Theil coefficients, structural transformation by the shares of the rural population in the total population in 1960, 1965, and 1970, and the middle-class bias by the ratio of income shares held by the fifth and first quintiles, relative, respectively, to the income share held by the third quintile (labelled as rich and poor quintiles).

Using an interaction model, we show that there is no evidence to support the captured democracy channel—although the coefficients on the interaction of democracy with our measures of initial land inequality are positive, they enter insignificantly. In contrast, the estimated coefficients for the interaction of democracy with: (1) rural population share (whether measured in 1960, 1965, or 1970), (2) rich quintile, and (3) poor quintile are all statistically significant, which indicate that structural transformation and the middle-class bias channels may be mediating the relationship between democracy and inequality.

The rest of the paper proceeds as follows. Next section describes econometric identification and provides data sources and definitions of variables. Section 3 reports the estimation results and documents

results from robustness checks. Section 4 investigates the potential mechanisms by which democracy may be impacting on inequality. The final section contains our concluding remarks.

2. Econometric identification and data

In this section, we first present the econometric model and estimation technique. We then discuss the relevant data, for which we centre on the variables that enter into tables and figures documented in the main text of this paper and use the Supplemental Appendix to provide information on all the other variables utilised for presenting further evidence in this paper.

2.1. Econometric identification

In order to test how inequality and redistribution vary with democracy, we postulate the following empirical model based on prior inequality studies (e.g., Dollar and Kraay 2002; Brueckner, Dabla-Norris, and Gradstein 2015):

$$z_{i,r,t} = \gamma d_{i,r,t} + x'_{i,r,t} \theta + y'_{i,r,t} \phi + \alpha_r + \beta_t + u_{i,r,t} \quad (1)$$

where z is some measure of the distribution of national income (namely the Gini coefficient and income quintiles), as observed in the i th country in the r th region in the t th time;⁴ d is an index of democracy (which is our main explanatory variable) in that country within that region at that time; x is a vector of other potential time-varying covariates (namely proxies for income growth, schooling, openness, financial development, inflation, and government size) that have been identified in the prior literature to be capable of explaining z ; y is analogous to vector x but contains only time-invariant controls (such as geographical factors and proxies for legal, colonial, or cultural heritage); α is region-specific effects; β is time-specific effects; and u is a disturbance term. γ , θ , and ϕ are parameters to be estimated, with the coefficient γ depicting the within-country estimate of the link between democracy and the income inequality measures.

To estimate Eq. 1, the primary identification issues to grapple with are the potential endogeneity biases; namely, omitted variables that may correlate with both z and d and reverse causation between the two variables. Their occurrence may likely determine the extent to which we can ascribe to our

⁴This econometric specification also borrows from Besley and Kudamatsu (2006), who investigated the roles of contemporaneous and long-term experiences of democracy in a country on its health indicators. They find that the correlation between life expectancy and democracy is substantial and robust to controlling for initial human capital level as well as legal and colonial histories.

results associational or causal interpretation. We resolve these problems by employing two-stage least squares (TSLS) estimation, which procedure requires identifying a sound source of change in a democracy that is not importantly related to other determinants of the distribution of national income. In pursuing this strategy, our preoccupation turns to that of finding a credible external instrument. For this, we turn to the work of Acemoglu, Naidu, Restrepo, and Robinson (2019), who constructed and used regional waves of democratisation and transitions to non-democracy (regional democratisation wave from now on) to obtain the exogenous source of variation in democracy to establish a causal effect of the latter on growth.⁵

Thus, the following model is estimated in the first-stage:

$$d_{i,r,t} = cZ_{i,r,t} + a_r + b_t + e_{i,r,t} \quad (2)$$

where the exclusion restriction is that regional democratisation wave, Z , only affects income inequality, z , through its influence on democracy, d . Further, in models containing an interaction of democracy with an interactive term, we will also use the interaction of regional democratisation wave with the interactive term as an instrument. We have additionally experimented with the econometric specification, where we do not instrument for the interaction of democracy with the interactive term (which estimates are undisplayed to conserve on space) and draw broadly similar conclusions to the reported results.

2.2. Data

To gauge the extent to which democratisation affects income inequality in a country, the starting point is finding appropriate empirical measures for our main variables, and we begin by describing our proxy for democracy. Our primary democracy measure is obtained from Marshall, Gurr, and Jagers (2018) database of the Center for Systemic Peace, whose dataset is compiled based on the conceptual framework of Eckstein and Gurr's (1975) patterns of authority. We emphasise their (institutionalised) democracy variable. This is a composite measure that was formulated around three assessed sub-scores for (1) the presence of institutions and procedures through which citizens can express effective preferences about alternative policies and leaders; (2) the existence of institutionalised constraints on the exercise of power by the executive; and (3) the guarantee of civil liberties to all citizens in their daily lives and acts of political participation.

⁵We briefly describe this instrumental variable below.

Our main variable to proxy income inequality is the Gini coefficient, which is measured based on the area between the Lorenz curve (a plot of the fraction of total income received against the fraction of recipients starting with the poorest individual or household) and a hypothetical line of absolute equality. We took this variable from Brueckner, Dabla-Norris, and Gradstein (2015), who used the high-quality observations from the UNU/WIDER-UNDP World Income Inequality Database (WIID 2008) version 2.0 and data from POVCALNET database of the World Bank.⁶ Brueckner, Dabla-Norris, and Gradstein (2015), taking due care, adjusted these datasets for each country in order to make them comparable as well as increase the available sample sizes for countries and observations.

While our choice of the Gini coefficient is consistent with it being the most widely used measure of aggregate inequality in the literature, we have also employed shares of income held by different (first, second, third, fourth, and fifth) quintiles. As examples, the first quintile measures the income share held by the lowest 20 per cent of the population and the fifth quintile measures the income share held by the highest 20 per cent of the population. Brueckner, Dabla-Norris, and Gradstein (2015), prompted by the discussion in Atkinson, Piketty, and Saez (2011), show that looking at these disaggregated values of income distribution may unmask important differences in income levels in a within-country analysis. We have borrowed this approach, as it helps us to determine how our primary result, that aggregate inequality falls, comes about when composite democracy rises.

With regards to the additional control variables, we use measures dictated by prior literature. In terms of estimating the effects of democracy on income inequality/quintiles, we follow Dollar and Kraay (2002) and Beck, Demirgüç-Kunt, and Levine (2007) in controlling for income growth, schooling, openness, financial development, inflation, and government size. Income growth is GDP per capita growth rate from World Development Indicators (WDI 2016). Schooling is the log of the share of the population with completed secondary school from Barro and Lee (2013). Openness is the log of the share of imports plus exports in GDP from WDI. Financial development is the log of the claims on the private sector by deposit money banks and other financial institutions as a share of GDP from the Global Financial Development Database (Cihak et al. 2012). Inflation is the log of a consumer price index (CPI) from WDI. Government size is the share of general government consumption expenditure in GDP.⁷ We label these controls inequality determinants from now on. In addition to these inequality

⁶See Dollar and Kraay (2002) and Beck, Demirgüç-Kunt, and Levine (2007), who utilised the same data sources to define the Gini coefficients used in their studies.

⁷The use of these standard determinants of economic growth as additional controls in empirical studies seeking to

determinants, we also employ land Gini and Theil coefficients from Frankema (2005), rural population from WDI, top income share, and bottom income share, as we explore whether they can provide evidence of a possible differential effect of democracy on income inequality using the Gini coefficient.

Next, we turn to the instrument for democracy: regional democratisation wave. Arguing that democratisation and social unrest that leads to a change of regime often happen in waves across regions, Acemoglu, Naidu, Restrepo, and Robinson (2019) construct this variable. Their hypothesis was underpinned by the recent Arab Spring, episodes of reversion of democracies to nondemocracies in the 1970s and transitions back to democracies in the 1980s and early 1990s of countries in Latin America and the Caribbean, and the experience of the Soviet Union in the 1990s, that triggered democratisations of many countries in Eastern Europe, Central Asia, and Africa.

Motivated by the observation that these regional patterns may be capturing the diffusion of the demand for democratic rule among countries within a region, Acemoglu, Naidu, Restrepo, and Robinson (2019) posited that democracy in the i th country is impacted by democracy in the set of countries in the same region with similar histories, political cultures, practical problems, and close informational ties. This can be summarised as follows: $I_{i,r} = \{i'_r : i'_r \neq i_r, R_{i'_r,r} = R_{i,r}, D_{i'_r,r,t_o} = D_{i,r,t_o}\}$, where D_{i,r,t_o} reflects whether the i th country in the r th region is a democracy or non-democracy when the sample began and $R_{i,r}$ represents the geographic region of i th country. With these sets to hand, Acemoglu, Naidu, Restrepo, and Robinson (2019) define regional democratisation wave for each country as $Z_{i,r,t} = \frac{1}{|I_{i,r}|} \sum_{i'_r \in I_{i,r}} D_{i'_r,r,t}$. The previous expression defines the jack-knifed mean of democracy in a region multiplied by the initial regime cell, which, by construction, leaves out own-country observation.

In our regression analysis, only the countries with at least two consecutive observations on the measures of income inequality are included. Moreover, given the availability of proxies for democracy, inequality determinants, and regional democratisation wave, we have a maximum of 118 countries with a total of 592 five-yearly observations spanning 1960-2010 in the regressions of inequality on democracy. Table 1 gathers a concise definition of the variables used for analysis in the main text and also provides their descriptive statistics, reporting on the mean, standard deviation, minimum, median, and maximum values.

explain income inequality is now common-place. See also Barro (2000), Roine, Vlachos, and Waldenstrom (2009), and Castello-Climent (2010), among others.

3. Do democracies raise or reduce inequality?

This section documents our paper’s main results with regards to the effect of democracy on inequality. The presentation of these results begins by evaluating the effect of democracy on the aggregate measure of income inequality (the Gini coefficient) in Table 2. We then formally examine the validity of the instrument in Table 3. In Table 4, we look at democracy’s impact on the income shares held by the first to the fifth quintiles. Our sensitivity analysis starts by conducting exercises that account for heterogeneity across time in Table 5 and heterogeneity across individual country characteristics in Table 6, as well as address the potential concerns that may relate to the presence of atypical observations and the benchmark definition of regional democratisation wave instrument in Tables 7 and A.7, respectively.

3.1. Effects of democracy on the Gini coefficient

We first present a simple cross-sectional relationship between democracy and the Gini coefficient in Fig. 1, which is plotted for the mean of observations over the 1960-2010 period for the countries in our sample. The graph suggests that the association between democracy and this measure of income inequality over these 50 years is negative. We have also plotted similar graphs (undisplayed) for each decadal average (the 1960s, 1970s, 1980s, 1990s, and 2000s) and we observe qualitatively comparable patterns for each decade.

Turning to a more in-depth analysis of the relationship between our two main variables, Table 2, Panel A, presents POLS estimates of regressing the Gini coefficient on democracy, with and without additional covariates. We start in column 1 by reporting POLS results, controlling for only time-specific effects. The result is a negative coefficient on the index of democracy, which is statistically significant at the 1% level. In columns 2-7 of Table 2, we sequentially add income growth, schooling, openness, financial development, inflation, and government size, respectively. In each case, we find that the relationship between democracy and the Gini coefficient continue to be negative and statistically significant at least at the 5% level.

In column 8 of Table 2, we simultaneously include all the determinants from columns 2-7, finding that the estimated effect of democracy on the Gini coefficient rises, relative to that in column 1, and remains statistically significant at the 1% level. We report in column 9 of Table 2 a model specification similar to that in column 8, but that also controls for region-specific effects. The result is still a negative coefficient on the index of democracy and is statistically significant at the 5% level. However, the absolute size

of the estimated coefficient has fallen by more than 50% compared to column 1. Further, it is worth underlining that the results confirm the relevance of democracy to increasing equality and, as can be seen, as more variables are added (moving from columns 2-9), the explanatory power of this paper’s econometric model is strengthened (the R-squared rises from 11.6% in column 1 to 68.1% in column 9).

Using the specification in column 9, Panel A of Table 2 (referred to as our preferred specification from now on), Fig. 2 depicts the residual of the Gini coefficient against the residual of democracy. The residual for the Gini coefficient is obtained by regressing it on democracy, inequality determinants, and time- and region-specific effects. The residual for democracy is obtained by regressing it on the same set of controls. This figure reveals that the slope of the regression line confirms the negative association between democracy and the Gini coefficient.

The cross-country correlations and POLS estimates mostly offer a transparent benchmark, but our main objective in this paper is to identify, if there is any, the causal relationship between democracy and inequality. With this in mind, Table 2, Panel B, presents estimates from our main identification approach (TSLS) that applies Acemoglu, Naidu, Restrepo, and Robinson’s (2019) regional democratisation wave as an instrumental variable. The main result that we want to emphasise is that the estimated coefficients across Panel B using TSLS are generally larger in absolute value than in Panel A that used POLS while having akin sign and significance levels. These findings also have a substantial economic effect. Using the result of our preferred specification in Panel B of Table 2 as an example, we gauge the economic significance of democracy on the Gini coefficient. All else being equal, a reduction in the Gini coefficient of 5.935 corresponds to 15% of mean Gini coefficient (39.4) and 39% of median Gini coefficient (15.3) for our sample of countries.

The first-stage results for the TSLS methodology establish that regional democratisation wave has positive and highly significant estimated effects on democracy in all columns, implying a priori a strong instrument.⁸ Moreover, we follow prior literature in reporting Kleibergen-Paap F-test to check for instrument quality. The test statistics in Panel B of Table 2 are in the interval 74-298, which again is supportive of regional democratisation wave being a good instrument for democracy. Throughout this paper, we have also documented the strictest Stock and Yogo (2005) weak ID critical values (i.e., the 10% maximal IV size). Based on the Kleibergen-Paap F-test and the Stock-Yogo test in Panel B of

⁸See Table A.1 in the Supplemental Appendix for the first-stage results of the effects of regional democratisation wave on democracy.

Table 2, we can reject the null hypothesis of weak instruments.

We have also compared the magnitude of our first-stage (Kleibergen-Paap) F-test to the rule of thumb value of 10 advised by Staiger and Stock (1997). While it may be instructive to stress that this test for weak instruments was developed initially in a cross-sectional data environment (see Bazzi and Clemens 2013), we have nevertheless followed the practice in the prior literature of applying it in a panel dataset environment. As shown, the magnitudes of the F-statistics serve to increase our credence that the problem of a weak instrument is highly unlikely to be of major concern with our results.

Meanwhile, to further bolster our confidence in the TSLS estimates, we more formally examine the validity of utilising Acemoglu, Naidu, Restrepo, and Robinson’s (2019) instrument in the context of our empirical investigation. To do this, we follow an established strategy in the prior literature and report the Hansen J test from overidentified regressions in Table 3. In particular, we employ, as ancillary instruments, in addition to regional democratisation wave, its 5-year lag in columns 1 and 4, the 5-year lag of democracy in columns 2 and 5, and both its 5-year lag and the 5-year lag of democracy in columns 3 and 6.

Columns 1-3 of Table 3 use TSLS, while columns 4-6 present estimates from using two-step generalised method of moments (TGMM) estimator, which Greene (2003) pointed out to be more efficient in overidentified two-stage regressions. The effects of democracy on the Gini coefficient in these regressions are again negative and statistically significant at least at the 10% level. The smallest p-value of this test is 0.69. Consequently, we cannot reject the joint hypothesis that the instrumental variables are uncorrelated with the second-stage disturbance term. Moreover, we obtained results similar to the benchmark findings in Table 2, in which the Kleibergen-Paap F-test of overidentifying restrictions are all well above 10 in Table 3.⁹

3.2. Effects of democracy on income quintiles

The results in the previous section show that democracy robustly negatively affects income inequality as proxied by the Gini coefficient. As discussed earlier, an important quest would be to identify the source of this inequality-declining effect of democracy. Towards this end, we re-estimate the econometric model stated in Eq. 1, taking first to fifth quintiles of income distribution as the dependent variables. To conserve on space, Table 4 only presents estimates from our preferred specification (where all inequality

⁹See Table A.2 in the Supplemental Appendix for the first-stage results of the effects of regional democratisation wave, its 5-year lag, and the 5-year lag of democracy on democracy.

determinants, time-, and region-specific effects are added). Panel A reports the POLS estimates and Panel B reports the corresponding TSLS estimates. Because the results in both panels of Table 4 are similar, we focus on the TSLS estimates, which is our main estimation approach.

The results show that a within-country improvement in the index of democracy positively affects income shares accruing to each of the first to fourth quintiles, whereas it negatively impacts on the income share flowing to the fifth quintile. All these estimates are statistically significant, except for the estimated coefficients of democracy with regards to the first quintile. These estimates are also economically substantial. For instance, the increase in the second quintile of 1.501 corresponds to 14% of mean second quintile (10.8) and 90% of its median value (1.66). Further, the equivalent increases in the third and fourth quintiles of 2.538 and 2.572, respectively, tie in with 17% and 12% of their means, which are 15 and 21.3 (and 49% and 23% of their medians, which are 5.16 and 11.4), respectively. For the fifth quintile, a decrease of 6.531 matches 14% of the mean (46.4) and 23% of the median (28.1).

Moreover, as in the relationship between democracy and the Gini coefficient, the absolute value of the TSLS coefficients are larger than those from POLS. Further, the reported Kleibergen-Paap F-test and the Stock-Yogo test indicate that we can reject the null hypothesis of weak instruments. The implication is that we can pinpoint why aggregate inequality has fallen: the shares of income held by the lower end of the income distribution have gone up with rising democratisation, while the opposite effect obtains between democracy and the income share of the wealthiest group.

3.3. Robustness tests

3.3.1. Heterogeneity across time

In Table 5, we carry out a robustness check in which we add to our preferred specification interactive term between democracy and a dummy variable for the post-1990 period. The result in column 1 shows that the effect of democracy interacted with post-1990 dummy variable is positive but statistically insignificant at the standard levels. In columns 2-6, we repeat this exercise for each income quintile. Out of the five cases, the effect of democracy interacted with post-1990 dummy variable is only significant at the 10% level for the third and fourth quintiles, for which the estimated coefficients are negative. In contrast, the obtained direct effect of democracy on these two quintiles continue to be positive and highly significant.

Thus, as before, increases in democracy continue to lead to reductions in the overall measure of income inequality and the share of income held by the fifth quintile. Conversely, increment in the shares

of income held by the first to fourth quintiles follows a rise in democracy. Looking at the magnitudes of the estimates in Table 5, our interpretation of these results is that, while post-1990 period global and national features may have worked to raise inequality, these effects have been tempered by democratic movements around the globe. Hence, we can see, for example, that the aggregate marginal impact of the increase in post-1990 democracy on the third and fourth quintiles are still positive and statistically significant.

3.3.2. Heterogeneity in country characteristics

In line with testing whether the effect of democracy on inequality differs with time, one may also be curious as to whether this effect differs between countries with different levels of income inequality and stages of economic development. Table 6 presents the estimates from exploring democracy interacted with dummy variables for high inequality in column 1, low inequality in column 2, high income in column 3, middle income in column 4, and low income in column 5. As shown, the results suggest that the negative and statistically significant relationship between democracy and the Gini coefficient established in the preferred specification, using our full sample, is broadly retained (columns 1 and 4-5). The estimates in this table, however, also indicate that there are essential heterogeneous effects of democracy on the Gini coefficient.

For instance, in countries with already high levels of inequality (column 1), the estimated coefficient on the interaction of democracy with this interactive term (high Gini) implies a statistically significant rise of inequality at the 5% level. Whereas, the estimated coefficient on the already low inequality countries is that the interaction of democracy with this interactive term (low Gini) further reduces inequality, which is equally statistically significant at the 5% level. When we turn our attention to consider different income levels, we see again that there are significant differential effects of democracy on the Gini coefficient that are distinguishable between high income and middle-income countries (column 3 and 4). However, there seems to be no interaction effect when we interact democracy with the dummy variable for low-income countries (column 5).

3.3.3. Atypical observations

Another robustness check involves addressing the concern that a few atypical observations may be leading this paper's results. We employ many different procedures for removing such observations and present the results in Table 7. First, column 1 reports the estimates from re-running our preferred

specification by dropping observations, for which the absolute Dfbeta is greater than $2/\sqrt{N}$, where N is the sample size (Belsley, Kuh, and Welsch 1980). Second, we drop in column 2 observations with absolute standardized residuals greater than 1.96. Third, we exclude in column 3 observations with a Cook’s distance above the rule-of-thumb sill of $4/N$. Fourth, we implement in column 4 a robust regression that assigns outliers smaller weights (Li 1985). Fifth, we compute in column 5 a robust regression that has the characteristic of being more robust in the presence of atypical observations by: (1) eliminating gross outliers based on Cook’s distance; and (2) running Huber iterations and bi-weighted iterations after obtaining initial values from the first step (Huber 1964).

In all scenarios, and for all measures of income inequality, we note that omitting atypical observations did not change the qualitative nature of our results that democracy has a negative causal and statistically significant effect on the Gini coefficient and the fifth quintile (Panels A and F of Table 7). In contrast, democracy has positive causal and statistically significant effects on the second to fourth quintiles. The effect of democracy on the first quintile continue to be broadly positive but insignificant.

3.3.4. Further evidence

We have also carried out several additional robustness checks, the results of which are reported in the Supplemental Appendix to conserve on space.

Accounting for the time dimension. In order to test whether the estimated effects on the Gini coefficients and the income quintiles differ by time horizon, Table A.4 addresses this concern by reporting the estimated effects of democracy measured over the previous 5 and 10 years in its Panels A and B, respectively. In doing this, we have borrowed the approach of Halter, Oechslin, and Zweimuller (2014), who motivated theoretically and provided empirical evidence for time dimension as an important factor in capturing the association between inequality and growth. Following these authors, Brueckner, Dabla-Norris, and Gradstein (2015) investigated the role of timing in their study of national income and its distribution.

In this paper, we adopt the same procedure to examine the relationship between democracy and inequality further. As shown in both panels of Table A.4, democracy measured over these longer time span continues to have statistical and economic significance on the Gini coefficient and the income quintiles, which are similar to those obtained in the benchmark results of Tables 2 and 4.

Alternative measures of inequality and democracy. Table A.5 explores the impact of democracy on income inequality and income quintiles, using two alternative measures of the Gini coefficient and several alternative definitions of democracy. The results for the alternative measures of the Gini coefficients are reported in columns 1-2. These Gini coefficients are captured by using data from the Standardised World Inequality Indicators Database (SWIID), which is constructed by Solt (2009). In column 1, we utilise net Gini (a measure of inequality after taxes and transfers), whereas, in column 2, we use gross Gini (a measure of inequality before taxes and transfers). The results in Panel A of Table A.5 regarding both net and gross Ginis confirm that our benchmark index of democracy is negatively and statistically significantly related to income inequality at least at the 5% level.¹⁰

In the remaining panels of Table A.5, we have also probed whether our main results rely on the measure of democracy employed. In particular, panels B-F represent democracy based on definitions and coding of the revised combined polity score by Marshall, Gurr, and Jagers (2018), the permanent and temporary transitions in and out of democracy by Acemoglu, Naidu, Restrepo, and Robinson (2019), the dichotomous measure by Cheibub, Ghandi, and Vreeland (2010), the dichotomous measure by Boix, Miller, and Rosato (2012), and the permanent transition to democracy by Papaioannou and Siourounis (2008). In general, we found that using these alternative measures of inequality and democracy leaves our paper’s main results broadly unchanged.

Disaggregated democracy. Up until now, our empirical measure of democracy has an aggregate nature, even when we use alternative definitions as in the results just discussed. We now disaggregate our primary measure of democracy into its three main components: executive recruitment, political competition, and executive constraints from Marshall, Gurr, and Jagers (2018). We then re-estimate our preferred specification but sequentially representing democracy by its three concept variables.

Table A.6 presents the results, showing the effect of these components on the dependent variables; summarised as follows: (1) the Gini coefficient is negative for all of the components, and statistically significant at least at the 10% level (columns 1-3 of Panel A); (2) the first quintile is positive for all, but insignificant at the standard significance levels (columns 4-6 of Panel A); (3) the second to fourth quintiles are positive for all, and statistically significant at least at the 10% level (columns 7-9 of Panel A and columns 1-6 of Panel B); and (4) the fifth quintile is negative for all, and statistically significant

¹⁰Note that to make comparison easier, we start by reproducing our benchmark results for the Gini coefficients, first to fifth income quintiles, and our main measure of democracy in the remaining columns of Panel A of Table A.5.

at the 5% level (columns 7-9 of Panel B). All these estimates are again similar to those obtained in the benchmark results of Tables 2 and 4.

Alternative definitions of the instrument. In this section, we report TSLS estimates that are based on alternative definitions of regional democratisation wave. In particular, instead of fixing the value of initial regimes at unity for countries that were democratic in the first five years that they appear in the sample, Acemoglu, Naidu, Restrepo, and Robinson (2019) further explore the implication of coding the initial regimes using alternative definitions. We employ two of these definitions in our analysis: (1) whether countries were democratic in 1960; and (2) based on detailed country characteristics, such as colonial history, types of dictatorships, and forms of democracies, at inception. We note that the main difference between the different constructions of regional democratisation wave instrument hinges on the definition of the initial regimes of countries.

Table A.7 presents the results of estimating our preferred specification, using the benchmark instrument in column 1 and the alternative definitions in columns 2-3. Panels A-F take the Gini coefficients and each of the five income quintiles as the dependent variable, respectively. The results of using these two alternative definitions of regional democratisation wave produced broadly comparable results to the benchmark results. In Table A.3, we show the first-stage results, which confirm that each variant of regional democratisation wave has a positive and highly significant estimated effect on democracy, implying a priori that they are reliable instruments.

Additional controls. Finally, in this section, we test the robustness of our results to including additional controls. Some of these controls have recently been used by Acemoglu, Naidu, Restrepo, and Robinson (2015), who scrutinised the association between democracy, redistribution, and inequality, and Acemoglu, Naidu, Restrepo, and Robinson (2019), who established a causal effect running from democracy to growth. The inclusion of these additional controls is, therefore, an important experiment because our results could be biased if these other variables that may affect inequality are also correlated with democracy, but have been omitted from our analysis.

Table A.8 presents the estimates from this exercise. In columns 1-6 of this table, we control for social unrest, ethnic fractionalisation, absolute latitude, legal origin, religion, and dummy variables to capture ex-Soviet states, respectively. As shown, we obtained broadly comparable results in Panels A-F (which documents findings for specifications taking the Gini coefficients and each of the five income

quintiles as the dependent variable, respectively) to the benchmark results of Tables 2 and 4.¹¹

Summary. Given the results regarding the differential effects of democracy on inequality across time and countries, our results demonstrate that it is imperative to avoid applying the same brushstroke to all countries, and even to the same country at different times, as we devise programmes to help alleviate the burden of Collier’s bottom billion. Hence, one size may not fit all in this new phase of SDGs in which we seek to reduce inequality, among other goals, such as eradicating poverty and hunger, improving education quality, attaining gender equality, and achieving responsible consumption and production, by 2030. Additionally, the salience of institutional development is shown with the alternative indicators of democracy coming to similar results as our primary measure of democracy. Moreover, our results indicate that all three components—executive recruitment, political participation, and executive constraint—of democracy are essential ingredients as we crusade against inequality.

4. Mechanisms

How does democracy influence inequality? The literature on the democracy-inequality nexus has identified some channels by which democratic transitions may shape the economic outcomes experienced by different fractions of a population. For instance, changes to how superordinates within a society are chosen can directly or indirectly produce market opportunities and outcomes that equalize or widen income gaps between initially different income groups within a society (Acemoglu and Robinson 2008). In this penultimate section, we follow Acemoglu, Naidu, Restrepo, and Robinson (2015) and fundamentally explore three potential mechanisms—namely, captured democracy, structural transformation, and the middle-class bias—via which democracy might affect inequality.

Using an interaction model, Table 8 presents the results, employing two measures to represent the captured democracy channel (land Gini coefficient in column 1 and land Theil coefficient in column 2), one proxy to denote the structural transformation channel (share of rural population, but measured at three different points—1960 in column 3, 1965 in column 4, and 1970 in column 5), and two measures to designate the middle-class bias channel (ratio of fifth to third quintiles—referred to as the rich quintile from now on—in column 6 and ratio of first to third quintiles—referred to as the poor quintile from now

¹¹The only exception is concerning the effect of democracy on the Gini coefficient in column 2 of Panel A of Table A.8, when we control for ethnic fractionalisation. This is consistent with the view that population heterogeneity may be one way by which political regimes affect income inequality in a country. We test this hypothesis in section 4 below.

on—in column 7).

Columns 1 and 2 show that the interaction of democracy with both measures of land inequality yields positive but insignificant estimates. Whereas, the direct effect of democracy on our measure of income inequality continues to be negative and statistically significant at least at the 10% level (we note that this result applies equally to the remaining columns). Columns 3-5, however, reveal that the interaction of democracy with the share of the rural population (regardless of whether it is measured in 1960, 1965, or 1970) produces a positive and statistically significant effect on the Gini coefficient at least at the 5% level. In the last two columns, we find evidence of highly significant interaction effects of democracy on the Gini coefficient, which is positive for the rich quintile (column 6) and negative for the poor quintile (column 7).

Additionally, some of the results reported in this paper, and the Supplemental Appendix, underscore the diminished inequality-effect of democracy, when schooling (column 3, Panel B of Table 2) and ethnic fractionalisation (column 2, Panel A of Table A.8) are introduced. An implication of this could be that democracy may be exerting its influence on inequality through these variables. We have, therefore, also investigated the education and population heterogeneity channels (results undisplayed to conserve on space). As in the captured democracy channel, we find no significant evidence to support these as credible mechanisms through which democracy impacts on inequality. Overall, these findings put structural transformation and the middle-class bias channels ahead of the captured democracy, education, and population heterogeneity channels, when one seeks to explain how democracy influences inequality.

5. Conclusion

This paper presents new evidence about the relationship between democracy and inequality. To confront potential biases, which includes omitted variables, reverse causation, and unobserved heterogeneity, as well as possible lower quality data in the prior literature, we perform a panel data analysis on high-quality data (that has been collated recently, using much-improved and transparent data construction procedures). Moreover, we set out to determine whether or not there is a causal effect running from democracy to inequality. Towards this goal, our strategy is to use the 2SLS approach for which we use the regional democratisation wave of Acemoglu, Naidu, Restrepo, and Robinson (2019) to isolate the exogenous variation in country-level democracy.

Overall, the evidence marshalled in this paper implies that political democracy matters for income inequality. In particular, our estimates suggest that on average democracy reduces inequality. Controlling for income growth, schooling, openness, financial development, inflation, government size, and region and time effects, we obtain a coefficient (standard error) of -5.94 (3.00), which is statistically significant at the 5% level. Economically, this implies that democracy accounts for 15% of the mean of our inequality measure (Gini coefficient) and to 39% of its sample median.

To identify how the aggregate measure of inequality may be falling due to democracy, we examine the latter's effect on income quintiles. The resulting estimates of the effects of a rise in the level of democracy are that (1) the relative income shares of the first to fourth quintiles rise, and (2) the relative income share of the fifth quintile falls. These results show that democracy reduces income inequality by significantly and disproportionately boosting income shares of folks at the lower end of the income distribution. However, because the positive effect of democracy on the first quintile is never statistically significant at standard levels, we proffer that this is supportive of Director's law of public expenditures that the middle class tends to redistribute from the wealthiest and poorest groups within a society to itself (Stigler 1970).

We have also assessed and confirmed that the above results are robust across time and country heterogeneities, to excluding atypical observations, to accounting for time dimension, to employing alternative measures of inequality and democracy (including disaggregating composite democracy into its component indicators), to alternative definitions of the instrument, and to entering additional control variables. Furthermore, our empirical examination finds that, of the three potential mechanisms investigated, structural transformation and the middle-class bias rather than the captured democracy are the most likely channels through which democracy significantly affects inequality. To the best of our knowledge, the evidence presented in this paper is one of the first in the economic literature to systematically research whether or not the exogenous content of democracy affects inequality in a panel data set-up using an external instrument.

As shown throughout this paper, democracy does robustly, significantly, and causally, influence inequality. These results are thus relevant to academia, policymakers, and practitioners. We now conclude by drawing out the policy implication of our work—namely that the global community (especially the UN and its partner agencies) should, as a policy agenda, place a greater emphasis on the political and institutional context in which the SDGs are expected to be fulfilled. The logic is apparent

to us, just as it was to Besley and Burgess (2003): policy reforms, accumulation of productive assets, and macroeconomic stability play essential roles if a country is to overcome the underlying historical and persistent traits that trapped it in poverty and inequality. Nevertheless, the success of whatever measures are taken is intricately intertwined with the extent to which the politics of a country has been reformed in a way that extends opportunities to households, refines the doing business climate, and improves the accountability of elected officials. Political and institutional, and not just economic, structural adjustment programmes may, therefore, be the way forward.

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Table 1
Variable definition and descriptive statistics

Variable	Definition	Mean	S. D.	Min.	Median	Max.	N
Gini coefficient	Inequality measure derived from the Lorenz curve based on household income.	39.4	10.9	15.3	15.3	75.2	592
First quintile	Income share held by the lowest 20 per cent of the population.	6.50	2.28	0.91	0.91	12.9	592
Second quintile	Income share held by the 2nd lowest 20 per cent of the population.	10.8	2.80	1.66	1.66	16.8	592
Third quintile	Income share held by the middle 20 per cent of the population.	15.0	2.73	5.16	5.16	21.0	592
Fourth quintile	Income share held by the 2nd highest 20 per cent of the population.	21.3	2.24	11.4	11.4	31.4	592
Fifth quintile	Income share held by the highest 20 per cent of the population.	46.4	9.34	28.1	28.1	79.3	592
Democracy	Composite institutionalised index of democracy from Polity IV.	0.57	0.40	0	0	1	592
Income growth	GDP per capita growth rate.	2.36	2.44	-5.12	-5.12	13.0	579
Schooling	Share of the population with completed secondary level education.	2.29	1.12	-2.30	-2.30	4.12	591
Openness	Share of imports plus exports in GDP.	4.01	0.58	2.16	2.16	5.90	569
Financial development	Claims on private sector by deposit money banks and other financial institutions as a share of GDP.	3.28	0.84	0.93	0.93	5.15	571
Inflation	Consumer price index.	2.08	1.21	-2.23	-2.23	7.83	564
Government size	Share of government expenditure in GDP.	1.30	0.92	-3.87	-3.87	3.85	468
Land Gini coefficient	Gini coefficient based on the distribution of land holdings, which is a measure of the disposable amount of land per farm.	61.6	14.4	29.1	29.1	85.7	483
Land Theil coefficient	Theil coefficient based on the distribution of land holdings, which is a measure of the disposable amount of land per farm.	0.37	0.20	0.070	0.070	0.83	483
Rural population, 1960	Share of a country's population that lives in rural areas in 1960.	53.0	20.3	7.54	7.54	96.5	443
Rural population, 1965	Share of a country's population that lives in rural areas in 1965.	54.9	22.5	6.86	6.86	97.7	524
Rural population, 1970	Share of a country's population that lives in rural areas in 1970.	52.7	23.2	0	0	97.2	540
Rich quintile	Ratio of fifth and third quintiles.	3.35	1.47	1.40	1.40	15.4	592
Poor quintile	Ratio of first and third quintiles.	0.42	0.10	0.098	0.098	0.98	592
Regional democratisation wave	Mean of democracy in a region multiplied by the initial regime cell, leaving i th country out.	0.59	0.40	0	0	1	590

Note: The table provides the definition of the main variables and reports the descriptive statistics. See the text for data sources.

Table 2
Democracy and income inequality

Dependent variable:		Gini coefficient							All inequality determinants + region- specific effects
Controls included:	None (1)	Income growth (2)	Schooling (3)	Openness (4)	Financial development (5)	Inflation (6)	Government size (7)	All inequality determinants (8)	(9)
<i>A.</i>									
POLS									
Democracy	-7.328*** (1.863)	-8.231*** (1.666)	-4.729** (2.201)	-8.893*** (1.721)	-6.959*** (1.679)	-8.618*** (1.831)	-8.178*** (1.566)	-7.514*** (1.800)	-3.000** (1.343)
R-squared	0.116	0.181	0.168	0.154	0.185	0.187	0.216	0.315	0.681
Observations	592	579	591	569	571	468	564	448	448
Countries	118	118	118	117	117	109	117	106	106
<i>B.</i>									
TSLS									
Democracy	-7.532*** (2.762)	-8.985*** (2.513)	-4.004 (3.588)	-9.454*** (2.490)	-7.677*** (2.913)	-8.987*** (2.760)	-9.006*** (2.428)	-8.742*** (3.345)	-5.935** (3.003)
Kleibergen-Paap F-test	298.16	278.14	225.04	255.95	187.03	203.79	258.15	144.49	74.28
Stock-Yogo test	16.38	16.38	16.38	16.38	16.38	16.38	16.38	16.38	16.38
Observations	590	577	589	567	569	466	562	446	446
Countries	118	118	118	117	117	109	117	106	106

Note: The table reports pooled ordinary least squares (OLS) estimates in Panel A and two-stage least squares (TSLS) estimates in Panel B. The instrumental variable for democracy is regional democratisation wave. The set of controls include time-specific effects, Kleibergen-Paap F-test reports the F-Statistic for the weakness of the instrument. Stock-Yogo test reports the strictest weak ID critical values (10% maximal IV size). Time periods are five-year intervals from 1960-2010. Robust standard errors clustered at the country level are shown in parentheses. ***, **, and * are significant at the 1%, 5%, and 10% level, respectively.

Table 3
Overidentification tests for regional democratisation wave

Dependent variable:	Gini coefficient					
	(1)	(2)	(3)	(4)	(5)	(6)
Democracy	-5.222*	-3.331**	-3.339**	-5.230*	-3.255*	-3.213*
	(2.987)	(1.699)	(1.695)	(2.984)	(1.697)	(1.680)
Kleibergen-Paap F-test	41.62	178.79	135.09	314.97	178.79	135.09
Hansen J-test	0.948	0.369	0.650	0.948	0.369	0.650
Stock-Yogo test	19.93	19.93	22.30	19.93	19.93	22.30
Observations	421	402	401	421	402	401
Countries	106	105	105	106	105	105

Note: The table reports two-stage least squares (TSLS) estimates in columns 1-3, and two-step generalized method of moments (TGMM) estimates in columns 4-6. The instrumental variables for democracy are: regional democratisation wave and its 5-year lag in columns 1 and 4, regional democratisation wave and the 5-year lag of democracy in columns 2 and 5, and regional democratisation wave, its 5-year lag, and the 5-year lag of democracy in columns 3 and 6. The set of controls include income growth, schooling, openness, financial development, inflation, government size, region-specific effects, and time-specific effects. Kleibergen-Paap F-Statistic reports the test for the weakness of the instrument. p value of the Hansen J-test is for overidentifying restrictions. Stock-Yogo test reports the strictest weak ID critical values (10% maximal IV size). Time periods are five-year intervals from 1960-2010. Robust standard errors clustered at the country level are shown in parentheses. ***, **, and * are significant at the 1%, 5%, and 10% level, respectively.

Table 4
Democracy and income quintiles

Dependent variable:	First	Second	Third	Fourth	Fifth
	quintile	quintile	quintile	quintile	quintile
	(1)	(2)	(3)	(4)	(5)
<i>A.</i>	POLS				
Democracy	0.0460	0.816**	1.274***	1.154***	-3.238***
	(0.272)	(0.318)	(0.381)	(0.346)	(1.199)
R-squared	0.594	0.688	0.664	0.533	0.682
Observations	448	448	448	448	448
Countries	106	106	106	106	106
<i>B.</i>	TSLS				
Democracy	0.0629	1.501**	2.538***	2.572***	-6.531**
	(0.609)	(0.754)	(0.818)	(0.722)	(2.658)
Kleibergen-Paap F-test	74.28	74.28	74.28	74.28	74.28
Stock-Yogo test	16.38	16.38	16.38	16.38	16.38
Observations	446	446	446	446	446
Countries	106	106	106	106	106

Note: The table reports pooled ordinary least squares (POLS) estimates in Panel A and two-stage least squares (TSLS) estimates in Panel B. The instrumental variable for democracy is regional democratisation wave. The set of controls include income growth, schooling, openness, financial development, inflation, government size, region-specific effects, and time-specific effects. Kleibergen-Paap F-test reports the F-Statistic for the weakness of the instrument. Stock-Yogo test reports the strictest weak ID critical values (10% maximal IV size). Time periods are five-year intervals from 1960-2010. Robust standard errors clustered at the country level are shown in parentheses. ***, **, and * are significant at the 1%, 5%, and 10% level, respectively.

Table 5

Democracy, income inequality and income quintiles: heterogeneity across time

Dependent variable:	Gini coefficient (1)	First quintile (2)	Second quintile (3)	Third quintile (4)	Fourth quintile (5)	Fifth quintile (6)
Democracy	-6.283* (3.247)	0.0247 (0.663)	1.611** (0.808)	2.715*** (0.878)	2.757*** (0.788)	-6.963** (2.872)
Democracy*post 1990 dummy variable	2.369 (2.579)	0.260 (0.588)	-0.749 (0.611)	-1.207* (0.662)	-1.262* (0.675)	2.937 (2.271)
Kleibergen-Paap F-test	36.61	36.61	36.61	36.61	36.61	36.61
Stock-Yogo test	7.03	7.03	7.03	7.03	7.03	7.03
Observations	446	446	446	446	446	446
Countries	106	106	106	106	106	106

Note: The table reports two-stage least squares (TSLS) estimates. The instrumental variable for democracy is regional democratisation wave. The instrumental variable for democracy interacted with post-1990 dummy variable is the interaction of regional democratisation wave with the post-1990 dummy variable. The set of controls include income growth, schooling, openness, financial development, inflation, government size, region-specific effects, and time-specific effects. Kleibergen-Paap F-test reports the test for the weakness of the instrument. Stock-Yogo test reports the strictest weak ID critical values (10% maximal IV size). Time periods are five-year intervals from 1960-2010. Robust standard errors clustered at the country level are shown in parentheses. ***, **, and * are significant at the 1%, 5%, and 10% level, respectively.

Table 6

Democracy and income inequality: heterogeneity across countries

Dependent variable:	Gini coefficient				
Interactive term:	High Gini (1)	Low Gini (2)	High income (3)	Middle income (4)	Low income (5)
Democracy	-7.269** (3.045)	0.891 (4.771)	0.348 (3.577)	-5.728** (2.633)	-6.389* (3.329)
Democracy*interactive term	6.716** (2.935)	-8.517** (3.534)	-7.396*** (1.835)	6.916*** (2.052)	2.518 (3.247)
Kleibergen-Paap F-test	28.64	11.62	17.43	39.30	29.68
Stock-Yogo test	7.03	7.03	7.03	7.03	7.03
Observations	446	446	446	446	446
Countries	106	106	106	106	106

Note: The table reports two-stage least squares (TSLS) estimates. The instrumental variable for democracy is regional democratisation wave. The instrumental variable for democracy interacted with an interactive term is the interaction of regional democratisation wave with the interactive term. The set of controls include income growth, schooling, openness, financial development, inflation, government size, region-specific effects, and time-specific effects. Kleibergen-Paap F-Statistic reports the test for the weakness of the instrument. Stock-Yogo test reports the strictest weak ID critical values (10% maximal IV size). Time periods are five-year intervals from 1960-2010. Robust standard errors clustered at the country level are shown in parentheses. ***, **, and * are significant at the 1%, 5%, and 10% level, respectively.

Table 7
Atypical observations

	Excluding observations with absolute DFBETA greater than $2/\sqrt{N}$	Excluding observations with absolute standardized residuals greater than 1.96	Excluding observations with Cook's distance greater than $4/N$	Li estimator	Huber estimator
	(1)	(2)	(3)	(4)	(5)
<i>A.</i>	Gini coefficient				
Democracy	-6.242* (3.237)	-7.012*** (2.646)	-6.125** (2.498)	-6.321** (2.678)	-3.352*** (1.070)
Kleibergen-Paap F-test	59.02	80.05	78.39	80.15	-
Observations	417	424	416	445	446
Countries	100	99	99	105	106
<i>B.</i>	First quintile				
Democracy	0.144 (0.699)	0.180 (0.555)	0.172 (0.552)	0.279 (0.536)	-0.00642 (0.252)
Kleibergen-Paap F-test	59.88	76.13	76.19	74.68	-
Observations	419	426	422	446	446
Countries	101	101	100	106	106
<i>C.</i>	Second quintile				
Democracy	1.749** (0.836)	1.764*** (0.675)	1.385** (0.631)	1.599** (0.663)	0.856*** (0.270)
Kleibergen-Paap F-test	60.36	75.04	79.34	80.59	-
Observations	417	423	419	445	446
Countries	100	100	100	105	106
<i>D.</i>	Third quintile				
Democracy	2.578*** (0.852)	2.806*** (0.687)	2.519*** (0.638)	2.478*** (0.652)	1.330*** (0.251)
Kleibergen-Paap F-test	57.29	72.13	75.52	87.39	-
Observations	414	426	417	443	446
Countries	102	102	101	104	106
<i>E.</i>	Fourth quintile				
Democracy	2.020*** (0.670)	2.473*** (0.619)	2.376*** (0.633)	2.232*** (0.504)	1.097*** (0.207)
Kleibergen-Paap F-test	72.80	84.10	83.56	106.76	-
Observations	406	418	413	434	446
Countries	101	103	102	105	106
<i>F.</i>	Fifth quintile				
Democracy	-6.124** (2.782)	-7.472*** (2.297)	-6.358*** (2.297)	-6.663*** (2.312)	-3.616*** (0.897)
Kleibergen-Paap F-test	60.51	82.21	78.82	83.67	-
Observations	416	421	416	445	446
Countries	100	99	100	105	106

The table reports two-stage least squares (TSLS) estimates. The instrumental variable for democracy is regional democratisation wave. The set of controls include income growth, schooling, openness, financial development, inflation, government size, region-specific effects, and time-specific effects. Kleibergen-Paap F-test reports the test for the weakness of the instrument. Stock-Yogo test's strictest weak ID critical values (10% maximal IV size) is 16.38. Time periods are five-year intervals from 1960-2010. Robust standard errors clustered at the country level are shown in parentheses. ***, **, and * are significant at the 1%, 5%, and 10% level, respectively.

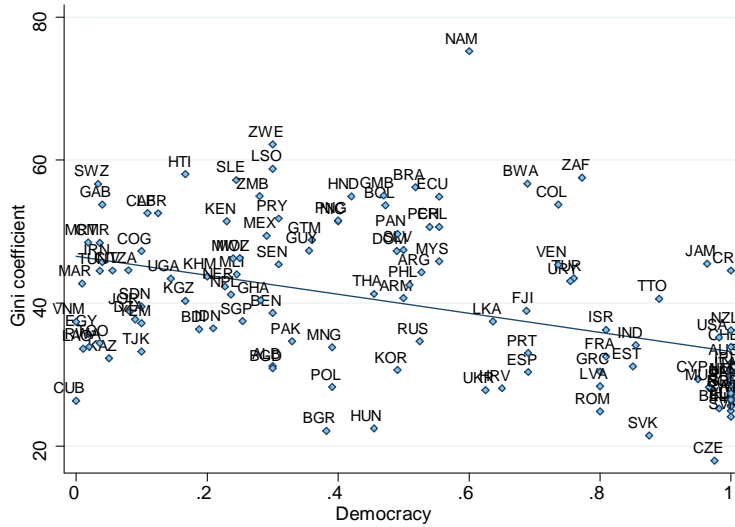
Table 8

Democracy, income inequality and income quintiles: investigating the mechanisms

Interactive term:	Dependent variable: Gini coefficient						
	Land Gini coefficient	Land Theil coefficient	Share of rural population 1960	Share of rural population 1965	Share of rural population 1970	Rich quintile	Poor quintile
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Democracy	-24.77*	-13.50**	-10.29**	-12.57***	-12.56***	-21.04***	12.76
	(14.39)	(6.043)	(4.186)	(4.545)	(4.352)	(4.021)	(8.787)
Democracy*interactive term	0.231	10.50	0.119**	0.126**	0.135**	6.054***	-45.21***
	(0.168)	(7.099)	(0.0523)	(0.0566)	(0.0564)	(0.927)	(15.21)
Kleibergen-Paap F-test	3.93	12.14	18.30	20.03	20.35	13.15	9.86
Stock-Yogo test	7.03	7.03	7.03	7.03	7.03	7.03	7.03
Observations	386	386	356	396	404	446	446
Countries	78	78	67	82	86	106	106

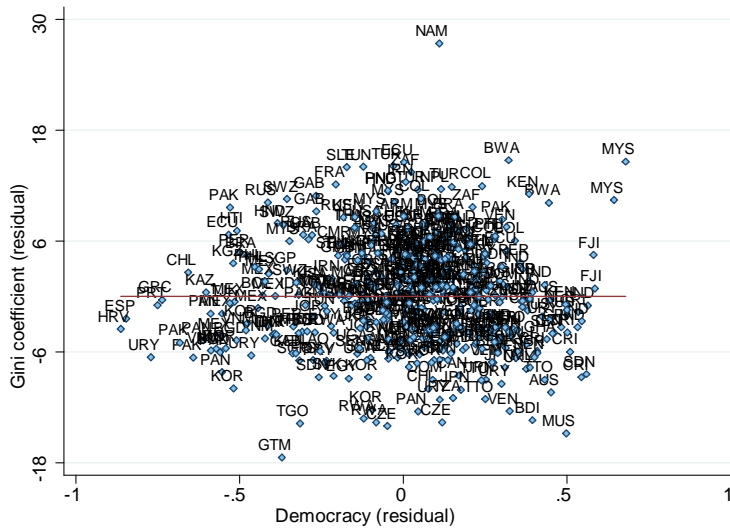
Note: The table reports two-stage least squares (TSLS) estimates. The instrumental variable for democracy is regional democratisation wave. The instrumental variable for democracy interacted with an interactive term is the interaction of regional democratisation wave with the interactive term. The set of controls include income growth, schooling, openness, financial development, inflation, government size, region-specific effects, and time-specific effects. Kleibergen-Paap F-Statistic reports the test for the weakness of the instrument. Stock-Yogo test reports the strictest weak ID critical values (10% maximal IV size). Time periods are five-year intervals from 1960-2010. Robust standard errors clustered at the country level are shown in parentheses. ***, **, and * are significant at the 1%, 5%, and 10% level, respectively.

Figure 1
Democracy and inequality



Note: Simple cross-country correlations between democracy and the Gini coefficient, averaged over the 1960-2010 sample period. Each diamond denotes a country/year observation; there are a total 120 observations.

Figure 2
Democracy and inequality (residuals)



Note: Scatter plots of the relationship between the residuals of democracy and the Gini coefficient. Each diamond denotes a country/year observation; there are a total 448 observations.

Table A.1
First-stage results: the effects of regional democratisation wave on democracy

Dependent variable:	Democracy								
	None (1)	Income growth (2)	Schooling (3)	Openness (4)	Financial development (5)	Inflation (6)	Government size (7)	All inequality determinants (8)	All inequality determinants + region- specific effects (9)
Regional democratization wave	0.771*** (0.0441)	0.760*** (0.0449)	0.728*** (0.0479)	0.754*** (0.0464)	0.673*** (0.0485)	0.742*** (0.0511)	0.746*** (0.0458)	0.653*** (0.0531)	0.539*** (0.0607)
R-squared	0.579	0.563	0.588	0.552	0.594	0.566	0.551	0.594	0.631
Observations	590	577	589	567	569	466	562	446	446
Countries	118	118	118	117	117	109	117	106	106

Note: The table reports pooled ordinary least squares (OLS) estimates. Time periods are five-year intervals from 1960-2010. Robust standard errors clustered at the country level are shown in parentheses. ***, **, and * are significant at the 1%, 5%, and 10% level, respectively.

Table A.2

First-stage results of overidentified regressions

Dependent variable:	Democracy					
	(1)	(2)	(3)	(4)	(5)	(6)
Regional democratization wave	0.595*** (0.167)	0.162*** (0.0482)	0.237* (0.134)	0.595*** (0.167)	0.162*** (0.0482)	0.237* (0.134)
Regional democratization wave, 5-year lag	-0.0460 (0.161)		-0.0712 (0.125)	-0.0460 (0.161)		-0.0712 (0.125)
Democracy, 5-year lag		0.625*** (0.0474)	0.624*** (0.0471)		0.625*** (0.0474)	0.624*** (0.0471)
R-squared	0.635	0.793	0.794	0.635	0.793	0.794
Observations	421	402	401	421	402	401
Countries	106	105	105	106	105	105

Note: The table reports pooled ordinary least squares (OLS) estimates. Time periods are five-year intervals from 1960-2010. Robust standard errors clustered at the country level are shown in parentheses. ***, **, and * are significant at the 1%, 5%, and 10% level, respectively.

Table A.3

First-stage results: the effects of alternative definitions of the instrument on democracy

Dependent variable:	Democracy		
	Regional democracy waves (1)	Regional democracy waves, 60 (2)	Regional democracy waves, re (3)
Alternative definitions of regional democratisation wave:			
Instrumental variable	0.539*** (0.0607)	0.535*** (0.0650)	0.420*** (0.0610)
R-squared	0.631	0.593	0.572
Observations	446	440	419
Countries	106	105	101

Note: The table reports pooled ordinary least squares (OLS) estimates. Time periods are five-year intervals from 1960-2010. Robust standard errors clustered at the country level are shown in parentheses. ***, **, and * are significant at the 1%, 5%, and 10% level, respectively.

Table A.4

Democracy, income inequality and income quintiles: looking at longer horizons

Dependent variable:	Gini coefficient (1)	First quintile (2)	Second quintile (3)	Third quintile (4)	Fourth quintile (5)	Fifth quintile (6)
<i>A.</i> Democracy over 5 years						
Democracy, 10 years	-5.128* (2.662)	0.128 (0.520)	1.368** (0.680)	2.164*** (0.752)	2.057*** (0.637)	-5.580** (2.397)
Kleibergen-Paap F-test	91.56	91.56	91.56	91.56	91.56	91.56
Stock-Yogo test	16.38	16.38	16.38	16.38	16.38	16.38
Observations	428	428	428	428	428	428
Countries	106	106	106	106	106	106
<i>B.</i> Democracy over 10 years						
Democracy, 15 years	-4.735* (2.708)	0.0242 (0.523)	1.281* (0.693)	1.993*** (0.749)	1.922*** (0.653)	-5.084** (2.415)
Kleibergen-Paap F-test	62.93	62.93	62.93	62.93	62.93	62.93
Stock-Yogo test	16.38	16.38	16.38	16.38	16.38	16.38
Observations	401	401	401	401	401	401
Countries	91	91	91	91	91	91

Note: The table reports two-stage least squares (TSLS) estimates. The instrumental variable for democracy is regional democratisation wave. The set of controls include income growth, schooling, openness, financial development, inflation, government size, region-specific effects, and time-specific effects. Kleibergen-Paap F-test reports the test for the weakness of the instrument. Stock-Yogo test reports the strictest weak ID critical values (10% maximal IV size). Time periods are five-year intervals from 1960-2010. Robust standard errors clustered at the country level are shown in parentheses. ***, **, and * are significant at the 1%, 5%, and 10% level, respectively.

Table A.5

Democracy, income inequality and income quintiles: alternative inequality and democracy data

Dependent variable:	Net Gini (1)	Gross Gini (2)	Gini coefficient (3)	First quintile (4)	Second quintile (5)	Third quintile (6)	Fourth quintile (7)	Fifth quintile (8)
<i>A.</i> Benchmark index of democracy from Marshall, Gurr, and Jagers (2019)								
Democracy	-9.198*** (3.173)	-7.390** (3.629)	-5.935** (3.003)	0.0629 (0.609)	1.501** (0.754)	2.538*** (0.818)	2.572*** (0.722)	-6.531** (2.658)
Kleibergen-Paap F-test	84.46	83.13	74.28	74.28	74.28	74.28	74.28	74.28
Observations	567	566	446	446	446	446	446	446
Countries	111	111	106	106	106	106	106	106
<i>B.</i> Polity2 score from Marshall, Gurr, and Jagers (2019)								
Democracy	-10.77*** (3.925)	-8.504* (4.439)	-7.266* (3.724)	0.0730 (0.750)	1.861** (0.946)	3.166*** (1.029)	3.242*** (0.899)	-8.169** (3.330)
Kleibergen-Paap F-test	81.30	80.57	67.72	67.72	67.72	67.72	67.72	67.72
Observations	578	577	452	452	452	452	452	452
Countries	113	113	107	107	107	107	107	107
<i>C.</i> Democracy index of Acemoglu, Naidu, Restrepo, and Robinson (2019)								
Democracy	-6.919*** (2.337)	-4.910* (2.693)	-4.613** (2.288)	0.0464 (0.475)	1.181** (0.581)	2.010*** (0.634)	2.058*** (0.567)	-5.186** (2.044)
Kleibergen-Paap F-test	96.19	94.05	68.99	68.99	68.99	68.99	68.99	68.99
Observations	585	584	452	452	452	452	452	452
Countries	116	116	107	107	107	107	107	107
<i>D.</i> Democracy index of Cheibub, Gandhi, and Vreeland (2010)								
Democracy	-7.666*** (2.552)	-5.457* (2.999)	-5.014** (2.418)	0.0504 (0.516)	1.284** (0.621)	2.184*** (0.656)	2.237*** (0.583)	-5.636*** (2.140)
Kleibergen-Paap F-test	72.87	70.86	56.15	56.15	56.15	56.15	56.15	56.15
Observations	585	584	452	452	452	452	452	452
Countries	116	116	107	107	107	107	107	107
<i>E.</i> Democracy index of Boix, Miller, and Rosato (2012)								
Democracy	-7.467*** (2.431)	-5.306* (2.863)	-5.057** (2.418)	0.0508 (0.520)	1.295** (0.618)	2.203*** (0.651)	2.256*** (0.590)	-5.685*** (2.136)
Kleibergen-Paap F-test	78.17	76.10	59.04	59.04	59.04	59.04	59.04	59.04
Observations	585	584	452	452	452	452	452	452
Countries	116	116	107	107	107	107	107	107
<i>F.</i> Democracy index of Papaioannou and Siourounis (2008)								
Democracy	-7.613*** (2.256)	-5.046* (2.581)	-4.248* (2.350)	0.0314 (0.447)	1.103* (0.600)	1.909*** (0.673)	1.896*** (0.637)	-4.811** (2.141)
Kleibergen-Paap F-test	101.61	101.30	85.32	85.32	85.32	85.32	85.32	85.32
Observations	552	551	425	425	425	425	425	425
Countries	107	107	99	99	99	99	99	99

Note: The table reports two-stage least squares (TSLS) estimates. The instrumental variable for democracy is regional democratisation wave. The set of controls include income growth, schooling, openness, financial development, inflation, government size, region-specific effects, and time-specific effects. Kleibergen-Paap F-test reports the test for the weakness of the instrument. Stock-Yogo test's strictest weak ID critical values (10% maximal IV size) is 16.38. Time periods are five-year intervals from 1960-2010. Robust standard errors clustered at the country level are shown in parentheses. ***, **, and * are significant at the 1%, 5%, and 10% level, respectively.

Table A.6
Disaggregated democracy, income inequality and income quintiles

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
A.									
Gini coefficient									
Democracy:									
Executive recruitment	-10.23*			0.0430			2.596*		
	(5.665)			(1.060)			(1.431)		
Political competition		-7.474**			0.0314			1.897**	
		(3.804)			(0.773)			(0.959)	
Executive constraint			-7.583*			0.0319			1.925*
			(3.910)			(0.785)			(0.988)
Kleibergen-Paap F-test	33.84	58.99	63.40	33.84	58.99	63.40	33.84	58.99	63.40
Observations	442	442	442	442	442	442	442	442	442
Countries	105	105	105	105	105	105	105	105	105
B.									
Third quintile									
Democracy:									
Executive constraint	4.433**			4.514***			-11.33**		
	(1.614)			(1.376)			(5.103)		
Political competition		3.240***			3.299***			-8.281**	
		(1.038)			(0.925)			(3.367)	
Executive constraint			3.287***			3.347***			-8.403**
			(1.086)			(0.948)			(3.481)
Kleibergen-Paap F-test	33.84	58.99	63.40	33.84	58.99	63.40	33.84	58.99	63.40
Observations	442	442	442	442	442	442	442	442	442
Countries	105	105	105	105	105	105	105	105	105
Fourth quintile									
Fifth quintile									

Note: The table reports two-stage least squares (TSLS) estimates. The instrumental variable for democracy is regional democratisation wave. The set of controls include income growth, schooling, openness, financial development, inflation, government size, region-specific effects, and time-specific effects. Kleibergen-Paap F-test reports the test for the weakness of the instrument. Stock-Yogo test's strictest weak ID critical values (10% maximal IV size) is 16.38. Time periods are five-year intervals from 1960-2010. Robust standard errors clustered at the country level are shown in parentheses. ***, **, and * are significant at the 1%, 5%, and 10% level, respectively.

Table A.7

Democracy and income inequality: alternative definitions of regional democratisation wave

Instrumental variable:	Benchmark	Alternative	
	Regional democracy waves (1)	Regional democracy waves, 60 (2)	Regional democracy waves, re (3)
<i>A.</i>	Gini coefficient		
Democracy	-5.935** (3.003)	-7.046** (3.158)	-7.800* (4.277)
Kleibergen-Paap F-test	74.28	63.85	44.32
Observations	446	440	419
Countries	106	105	101
<i>B.</i>	First quintile		
Democracy	0.0629 (0.609)	-0.192 (0.650)	0.0360 (0.863)
Kleibergen-Paap F-test	74.28	63.85	44.32
Observations	446	440	419
Countries	106	105	101
<i>C.</i>	Second quintile		
Democracy	1.501** (0.754)	2.020** (0.796)	2.116** (1.067)
Kleibergen-Paap F-test	74.28	63.85	44.32
Observations	446	440	419
Countries	106	105	101
<i>D.</i>	Third quintile		
Democracy	2.538*** (0.818)	2.911*** (0.858)	3.127*** (1.131)
Kleibergen-Paap F-test	74.28	63.85	44.32
Observations	446	440	419
Countries	106	105	101
<i>E.</i>	Fourth quintile		
Democracy	2.572*** (0.722)	3.147*** (0.739)	3.419*** (0.974)
Kleibergen-Paap F-test	74.28	63.85	44.32
Observations	446	440	419
Countries	106	105	101
<i>F.</i>	Fifth quintile		
Democracy	-6.531** (2.658)	-7.848*** (2.777)	-8.532** (3.755)
Kleibergen-Paap F-test	74.28	63.85	44.32
Observations	446	440	419
Countries	106	105	101

Note: The table reports two-stage least squares (TSLS) estimates. The instrumental variable for democracy is regional democratisation wave. The set of controls include income growth, schooling, openness, financial development, inflation, government size, region-specific effects, and time-specific effects. Kleibergen-Paap F-test reports the test for the weakness of the instrument. Stock-Yogo test's strictest weak ID critical values (10% maximal IV size) is 16.38. Time periods are five-year intervals from 1960-2010. Robust standard errors clustered at the country level are shown in parentheses. ***, **, and * are significant at the 1%, 5%, and 10% level, respectively.

Table A.8
Democracy and income inequality: additional controls

Controls included:	Social unrest (1)	Ethnic fractionalization (2)	Absolute latitude (3)	Legal origin (4)	Catholic, muslim and protestant share of population (5)	Soviet dummies (6)
<i>A.</i> Gini coefficient						
Democracy	-7.027** (2.833)	-4.648 (2.872)	-5.521** (2.541)	-6.748** (3.042)	-5.778* (3.291)	-6.349** (3.082)
Kleibergen-Paap F-test	79.19	76.01	72.41	73.01	59.07	71.73
Observations	432	446	446	446	444	446
Countries	104	106	106	106	105	106
<i>B.</i> First quintile						
Democracy	0.183 (0.602)	-0.0890 (0.587)	-0.0109 (0.542)	0.460 (0.573)	-0.0783 (0.672)	0.256 (0.599)
Kleibergen-Paap F-test	79.19	76.01	72.41	73.01	59.07	71.73
Observations	432	446	446	446	444	446
Countries	104	106	106	106	105	106
<i>C.</i> Second quintile						
Democracy	1.760** (0.712)	1.185* (0.715)	1.398** (0.646)	1.667** (0.736)	1.405* (0.842)	1.585** (0.771)
Kleibergen-Paap F-test	79.19	76.01	72.41	73.01	59.07	71.73
Observations	432	446	446	446	444	446
Countries	104	106	106	106	105	106
<i>D.</i> Third quintile						
Democracy	2.883*** (0.768)	2.135*** (0.788)	2.433*** (0.706)	2.553*** (0.860)	2.588*** (0.915)	2.535*** (0.856)
Kleibergen-Paap F-test	79.19	76.01	72.41	73.01	59.07	71.73
Observations	432	446	446	446	444	446
Countries	104	106	106	106	105	106
<i>E.</i> Fourth quintile						
Democracy	2.913*** (0.676)	2.212*** (0.727)	2.500*** (0.651)	2.304*** (0.774)	2.842*** (0.798)	2.432*** (0.761)
Kleibergen-Paap F-test	79.19	76.01	72.41	73.01	59.07	71.73
Observations	432	446	446	446	444	446
Countries	104	106	106	106	105	106
<i>F.</i> Fifth quintile						
Democracy	-7.595*** (2.480)	-5.316** (2.560)	-6.174*** (2.252)	-6.839** (2.751)	-6.567** (2.906)	-6.665** (2.760)
Kleibergen-Paap F-test	79.19	76.01	72.41	73.01	59.07	71.73
Observations	432	446	446	446	444	446
Countries	104	106	106	106	105	106

Note: The table reports two-stage least squares (TSLS) estimates. The instrumental variable for democracy is regional democratisation wave. The set of controls include income growth, schooling, openness, financial development, inflation, government size, region-specific effects, and time-specific effects. Kleibergen-Paap F-test reports the test for the weakness of the instrument. Stock-Yogo test's strictest weak ID critical values (10% maximal IV size) is 16.38. Time periods are five-year intervals from 1960-2010. Robust standard errors clustered at the country level are shown in parentheses. ***, **, and * are significant at the 1%, 5%, and 10% level, respectively.