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THE FUNDAMENTAL DETERMINANTS OF ECONOMIC INEQUALITY IN AVERAGE INCOME ACROSS COUNTRIES: THE DECLINING ROLE OF POLITICAL INSTITUTIONS

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Within the fundamental determinants of cross-country income inequality, political institutions represent a hallmark factor that societies can influence. Focusing on the portion of inequality explainable by differences in political institutions, we decompose annual cross-country Gini coefficients from 1960–2012. Although inequality has marginally decreased since 1988, the portion that *cannot* be explained by political institutions has increased markedly, with the explanatory power of institutions falling rapidly from the late 1980s to the early 1990s. This result prevails when using alternative variables, weightings, samples, and controls, and appears to be unlikely to be driven by contemporary regional events alone. However, we find that the link between institutions and income levels has become increasingly nonlinear as countries with the most inclusive political institutions enjoy even higher incomes than before. Our results imply that, if we hold societies responsible for their political institutions, cross-country inequality has become notably less fair since the late 1980s.

JEL Codes: D63, E02, O47

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1. INTRODUCTION

Within the fundamental determinants of economic development, Douglass North and, more recently, Daron Acemoglu, Simon Johnson, and James Robinson (AJR from hereon) have established the role of political institutions in shaping countries' income levels and, accordingly, inequality across countries.[1] Consequently, societies are, at least to some degree, responsible for their country's economic performance via the formation of political institutions. In fact, political institutions are commonly defined as "humanly devised" (North, 1990) and "man-made factors" that are "ultimately the choice of society" (Acemoglu and

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[1]See North and Thomas (1973), as well as North (1990, 1994). For the more recent work by AJR, we refer to Acemoglu et al. (2001, 2002, 2005), Acemoglu (2008), and Acemoglu and Robinson (2012). We also point to Rodrik et al. (2004) in this context.

Robinson, 2012). These definitions starkly contrast at least one other fundamental determinant of income levels: geography, which commonly refers to agricultural suitability, climate, disease exposure, natural resource abundance, ruggedness, or simply geographical location.[2] Indeed, this distinction is likely the main conclusion of the associated hypothesis advocated by AJR—that countries are not destined to be poor because of bad luck (e.g. geography) but, rather, choices related to their institutions matter.[3] Put differently, if political institutions are the driving factor of international inequality, then societies can, at least to some degree, be held responsible for developments in international income inequality. Conversely, if geography was the key determinant, less could be done to alleviate income inequality across countries.

In this paper, we offer a new look at cross-country income inequality and its development over time by decomposing a cross-country Gini index into the explanatory power of political institutions and geography. We employ a recently developed method for decomposing a standard Gini index into "responsibility factors" and "non-responsibility factors" (see Almås et al., 2011, 2012). In extensions and robustness checks, we also consider culture and education as two remaining fundamental determinants of economic development.

We focus on political institutions for two reasons. First, a large body of literature finds that institutions not only explain and determine income levels, but perhaps matter more than other fundamental long-term determinants, such as culture or geography (Knack and Keefer 1995; Acemoglu et al., 2001, 2005; Rodrik et al., 2004; Acemoglu and Robinson, 2012). Second, from a policy perspective, if we seek to alleviate inequality between countries, it is important to know how much of international inequality can be attributed to human activity and decisions, as opposed to exogenous factors that humanity cannot influence. In this context, while geography is virtually impossible to change and culture tends to persist over long time periods, history shows that political institutions can be changed relatively quickly.[4] For example, rapid institutional reforms were undertaken across many developing countries in the early 1990s (Savoia and Sen, 2016) and Rodrik et al. (2004) attest that "institutions have changed remarkably in the last three decades." Considering the explanatory power of political institutions for inequality, our analysis focuses on whether, and how, this relationship has changed since the 1960s.

Our analysis uses country-year level data for GDP per capita and the quality of political institutions. Considering a large sample of 95 countries (covering approximately 85 percent of the world population), we derive an *adjusted* Gini coefficient for each year, which represents the degree of inequality between countries, after excluding the role of institutions. The adjusted Gini compares the actual cross-country distribution of income to what the distribution of income would look like if it were based solely on the quality of countries' political institutions.

[2]Among others, Jeffrey Sachs and several co-authors have argued for the importance of these geographical conditions (e.g. Sachs and Warner, 1997; Gallup et al., 1999; Sachs 2001, 2003; Sachs and Malaney 2002). Nunn and Puga (2012) examine the role of ruggedness.

[3]Of course, a number of exogenous factors may influence choices related to political institutions, such as particular historical events (e.g. colonisation or conflicts and wars) and domestic distribution of de facto and de jure political power.

[4]See Nunn and Wantchekon (2011), Voigtländer and Voth (2012), or Alesina et al. (2013) among others for how cultural attitudes may change over time.

Our key finding shows that political institutions have been explaining less and less of international inequality since the late 1980s, with a substantial drop occurring between 1988 and 1993. Today, differences in political institutions are only half as powerful for explaining inequality as in the 1970s and 1980s. At the same time, geographical variables have become stronger predictors, approximately doubling their magnitude. From a normative perspective, if institutions were the only fundamental determinant that we hold countries accountable for, inequality between countries has become more unfair over the last 30 years, i.e. less explainable by institutions as a responsibility factor. This trend remains robust when (i) considering a larger sample of countries (over a shorter period of time), (ii) testing alternative measures for geography, institutional quality, and per capita income, and (iii) weighting countries by population size. Further, this finding holds when controlling for cultural attributes and education levels—the two other fundamental determinants of countries' income levels.

We then consider whether particular historical events are able to account for the declining explanatory power of institutions. In particular, we focus on Eastern Europe after the fall of the Soviet Union, the rise of China and other Asian success stories, as well as institutional monocropping in Africa, following Evans (2004).[5] However, none of these region-specific events are able to explain our key result, hinting at a general, global development. Shedding some light on the channel through which the result is operating is the additional observation of an increasingly nonlinear relationship between our measure of institutional quality and global inequality. In particular, those countries with especially high quality of institutions have enjoyed even higher income levels within the last two decades, while distinctions between lesser levels of institutional quality have become less important.

The paper proceeds as follows. Section 2 provides some background on international income inequality, discussing the relevant literature. Section 3 describes the data, while Section 4 explains the adjusted Gini technique. In Section 5, we present the main empirical findings. Section 6 examines whether particular historical events are responsible. Section 7 offers some additional insight into possible causes of our findings, while Section 8 provides some caveats of our analysis and suggestions for future research. Finally, Section 9 offers a brief summary and conclusion.

2. Background

2.1. *Inequality Concepts*

We focus on inequality *between* countries, commonly referred to as "international inequality," which accounts for approximately 85 percent of global inequality, as opposed to within-country inequality (Milanovic, 2005, 2012b).[6] The best predictor of a child's future income is the country they are born in. For example,

[5]Institutional monocropping refers to the imposition of 'best practice' Western-style institutional reforms on the global South, which occurred mainly during the 1980s and 1990s (Mkandawire, 2012; Savoia and Sen, 2016).

[6]The significance of international inequality (i.e. inequality between countries) is further highlighted by the United Nations including the need to "reduce inequality among countries" as part of their global Sustainable Development Goals (UN General Assembly, 2015).

according to Milanovic (2012b), even the poorest citizens of Denmark will be far richer than the richest in Mali. In a similar vein, (Milanovic, 2015) shows that over half of the variability in personal income among the global population is explained by country of residence and the income distribution within that country. Further, they find that generally only for the extreme rich or poor is distributional position within one's own country more important in explaining one's global standing than the mean income level of their country. For the broad middle class, they identify mean country income as the key determinant of an individual's own income.

International inequality is typically considered in terms of two concepts: unweighted and population-weighted inequality (Milanovic, 2005). Due to rapid growth in highly populated nations, such as China and India, the evolution of population-weighted inequality has been different to that when all countries count equally (Bourguignon et al., 2004; Sala-i-Martin, 2006; Milanovic, 2013). We concentrate on unweighted international inequality, as this more closely reflects the country as the unit of analysis, with the collective population, regardless of the size, being treated as the decision makers regarding political institutions. However, considering population-weighted inequality does not affect our results (see Section 5.2). We refer the reader to Section A.3.1 in the appendix for further discussion of the associated literature on concepts of world inequality.

Examining unweighted inequality over the post-war period, Milanovic (2012a) finds that while inequality (measured by Gini coefficients) remained relatively stable over the 1960s and 1970s, countries rapidly diverged over the 1980s and 1990s.[7] He attributes this increased inequality to the poor performance of the former Soviet Union, the "lost decade" in Latin America, and substantial declines in many African nations. However, he shows that alongside improved growth in these regions, unweighted inequality reached a turning point in 2001.[8] Since 2001, average growth rates for large parts of Sub-Saharan Africa and other developing countries have been consistently higher than those of the developed world. While the spread of income between countries has become more equal, unweighted international inequality is still considerably higher today than in the 1960s and 1970s.

2.2. *Fundamental versus Proximate Determinants*

In explaining differences in income levels across countries, the literature typically distinguishes between two distinct groups: fundamental and proximate. This paper considers fundamental determinants, that is, the "deeper" factors that drive differences between rich and poor countries (Rodrik et al., 2004; Acemoglu et al., 2005). These stand in contrast to proximate causes of economic growth, such as factor accumulation and technological change (Hall and Jones, 1999; Hsieh and Klenow, 2010). For example, Acemoglu (2008) proposes that the incentives for "accumulation, investment, and trade" (as more proximate factors) are ultimately shaped by fundamental determinants, in particular, institutions.

[7]In seminal studies of convergence between countries, Pritchett (1997) finds a general trend of 'divergence, big time' dating back to 1870 and Sala-i-Martin (1996) notes considerable sigma divergence over the period of 1960 to 1990.

[8]The exact timing of this turn has been disputed, with Bourguignon et al. (2004) suggesting that inequality rose until at least 2002 and Anand and Segal (2014) finding divergence until at least 2005.

Following influential work by North and Thomas (1973) and North (1990), an extensive body of literature has established institutions as a major, and perhaps the most important, fundamental determinant of income levels (Knack and Keefer, 1995; Hall and Jones, 1999; Acemoglu et al., 2001, 2002; Rodrik et al., 2004; Acemoglu et al., 2005; Tan, 2010; Acemoglu and Robinson, 2012). We focus specifically on the role of *political* institutions. This aligns with Acemoglu et al.'s (2005) "hierarchy of institutions," whereby political institutions influence economic institutions, which in turn determine economic outcomes and, accordingly, international income inequality.

The conclusion that "institutions matter most" is not unanimous, with some evidence pointing toward the importance of other fundamental determinants. In this paper we do not seek to enter the debate over which determinant matters the most for income levels, but rather how determinants explain international income *inequality* and how this relationship may have changed over time. In fact, the validity of institutions as a causal determinant of growth is not necessarily inconsistent with a theory that emphasizes other factors (Brock and Durlauf, 2001; Durlauf et al., 2005). Nonetheless, after initially focusing on institutions and geography, we also consider culture and education (e.g. see Guiso et al., 2006, or Gorodnichenko and Roland, 2011, for culture; we refer to Glaeser et al., 2004, and Lee and Kim, 2009, for the role of education).[9]

2.3. *Institutions and Inequality Between Countries*

In a related body of literature, the relationship between institutional quality and *within*-country inequality is explored (Chong and Gradstein, 2007; Glaeser, 2005; Savoia et al., 2010). Researchers have generally observed a correlation between inequality and low quality of institutions or democracy, though this relationship is not robust to all countries' experiences (Gradstein and Milanovic, 2004). Furthermore, the relationship between a country's income inequality and the strength of their institutions may exhibit reverse causality (Chong and Gradstein, 2007; Kotschy and Sunde, 2017). An advantage of our approach is that by focusing on inequality in average incomes across countries we largely avoid this problem.

Of the studies that assess the determinants of international inequality, most focus on explaining the trend in population-weighted inequality and mainly consider the role of certain countries, especially China (Firebaugh and Goesling, 2004; Chotikapanich et al., 2012; Ram, 2015). However, to our best knowledge, no research has attempted to directly assess how any of the fundamental determinants of income levels might explain the trend in either unweighted or population-weighted inequality between countries. Perhaps the closest studies to ours are those that consider institutions when assessing convergence between countries. In this context, we build on work by Keefer and Knack (1997), who propose that "the ability of poor countries to catch up is determined in large part by the institutional environment in which economic activity in these countries takes place." More recently, Tan (2010) similarly concludes that institutions generally "rule"

[9]See Section A.3.2 in the appendix for further explanation for the role of culture, education and geography as other major fundamental determinants.

overall when explaining cross-country divergence. However, these works tend not to consider how institutions may have become more or less important for explaining inequality at different points in time.

Knack (1996) hints at this idea. At first glance, his findings imply the need for institutional reform in poorer nations to facilitate convergence to the rich. However, he then contends that

> "it does not necessarily follow that [the] sudden adoption [of good institutions] by other nations, in the absence of other [e.g. cultural] changes, would show similar results: perhaps those nations, which would benefit from reform have already reformed, and those which would benefit less have not reformed."

This encapsulates the notion that the relationship between the quality of institutions and international inequality might change. We build on Knack's (1996) argument by examining whether and how the explanatory power of political institutions has, in fact, changed over time.

3. Data

3.1. *The Baseline Sample*

Given the availability of information on political institutions and comparable GDP per capita numbers (which we will discuss shortly), we initially consider a baseline sample of 95 countries, representing approximately 85 percent of the world population (see appendix Table A.1 for a list). Covering the period from 1960 to 2012, this balanced sample generates 5,035 country-year observations. In additional estimations, we will show that our results are robust to extending the sample to an even larger number of countries, at the expense of a shorter time frame. The baseline sample includes countries from Africa (24), Asia (22), Eastern Europe (6), Latin America (21) and Western Europe, North America, and (rich) Oceania (WENAO) (22). These include 18 of the 20 largest countries by population size. Bangladesh and Vietnam are the two exclusions due to incomplete institutional quality data dating back to 1960, although our results are robust to including them later as part of the larger, yet shorter sample. In the baseline case, we begin in 1960 as this represents the earliest year that PPP-adjusted income data are widely available for most former colonies (Milanovic, 2005) and GDP per capita estimates are generally considered far more reliable for this post-war period (Lindgren, 2008).

Our analysis includes key measures of per capita incomes and the quality of political institutions. For the baseline results, we control for a set of geographical variables, including *latitude* (in line with Hall and Jones, 1999, and Mirestean and Tsangarides, 2016), as well as binary variables for whether a country is an *island* or *landlocked*, following Gallup et al. (1999) and Acemoglu et al. (2001). For robustness checks we draw additional variables from conventional country-level data sources. Appendix Table A.2 gives descriptions of all variables used in the empirical analysis.

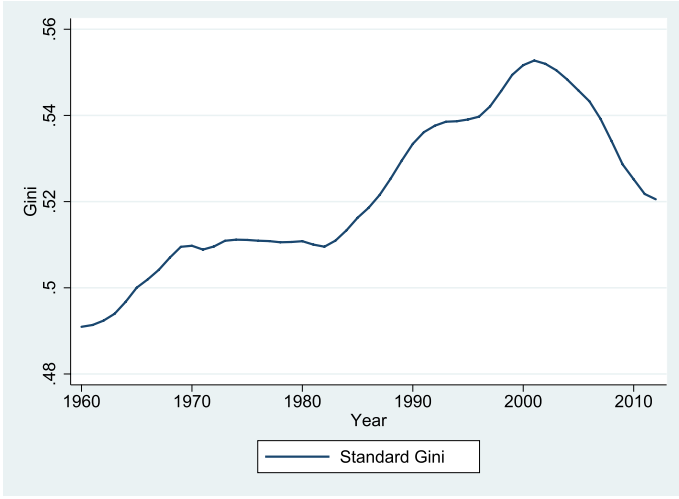

Figure 1. Standard Gini coefficients for inequality in *GDP per capita*, using the benchmark sample of 95 countries from 1960 to 2012.
[Colour figure can be viewed at wileyonlinelibrary.com]

3.2. *Per Capita Incomes*

To measure income inequality, we assess differences between countries' GDP per capita in terms of Purchasing Power Parity (PPP). We draw baseline data from Gapminder (2014), which provides updated figures for the most recent (2011) round of the International Comparison Program (ICP) PPP estimates.[10] In acknowledging debate surrounding the reliability of the 2011 PPP figures (Deaton and Aten, 2014; Inklaar and Rao, 2017; Ravallion, 2014) and of the ICP more generally (Piketty et al., 2014), we confirm results using an alternative set of per capita income data drawn from the Penn World Table (Heston et al., 2012), which employ the 2005 ICP PPP estimates.

Figure 1 plots the standard Gini coefficients for the baseline sample, which measure inequality in GDP per capita and are expressed as 3-year moving averages. It is apparent that unweighted international inequality has mostly increased over time, with the standard Gini rising from 0.491 in 1960 to a peak of 0.553 in 2001. The most rapid divergence can be seen from the mid 1980s until the early 2000s. To add perspective, in 1960, the richest country in the sample, Switzerland, had a per capita income that was 48 times that of the poorest country, Ethiopia. By comparison, at the peak of disparity in 2001, the richest country, now Luxembourg, was 170 times richer than the poorest country, the Democratic Republic of Congo. Importantly, however, inequality between countries reached a turning point in 2001. In total, this measure of inequality rose by 12.6 percent up until 2001 but has since declined by 5.8 percent, returning to a degree similar to that seen in the late 1980s.

[10]Gapminder (2014) data, available under http://www.gapminder.org/data/, are compiled from several sources. For example, Maddison online is the major source for national growth rates.

A similar "reversal of divergence" after 2001 is observed by Milanovic (2012a), though their Ginis are of a different magnitude due to a differing sample. Furthermore, our baseline Ginis are generally within close range to other inter-country Ginis estimated in the associated literature (Firebaugh, 1999; Anand and Segal, 2014).

3.3. *Political Institutions*

For an indicator of the quality of political institutions, we first refer to Keefer and Knack (1997), Acemoglu and Johnson (2005), and Acemoglu (2008), who highlight the importance of checks on the executive, i.e. having institutions that inhibit governments from undertaking dramatic or overly frequent policy changes that benefit themselves ahead of society. Accordingly, an ideal measure of institutional quality would be the index of *executive constraints* provided by the Polity IV dataset (established by Marshall and Jaggers, 2002), as this directly captures the "extent of institutionalized constraints on the decision-making powers of chief executives" (Marshall et al., 2014).

However, the limited availability of *executive constraints* considerably restricts the sample to 52 (rather than 95) countries over 1960—2012. Therefore, as a baseline measure we instead use the *polity*2 variable, drawn from the Polity IV dataset, which has been widely used in the empirical literature as a combined indicator of institutional quality (Huang, 2010; Hodler and Raschky, 2014; Mirestean and Tsangarides, 2016). Employing *polity*2 generally allows for a larger sample of countries over a substantially longer time period than can be achieved using alternative indicators of institutional quality, such as risk of expropriation or other measures drawn from the International Country Risk Guide (as used in Keefer and Knack, 1997, Hall and Jones, 1999, and Acemoglu et al., 2001). Measuring the degree of democracy of each country, *polity*2 ranges from −10 to +10 (the larger the score, the greater the institutional quality) and is built from three component variables, one of which, importantly, is the index of *executive constraints*.[11] Assessing the period from 1980 onwards, where *executive constraints* becomes available for a larger sample of 92 countries, *polity*2 and *executive constraints* display a correlation of 0.961, which highlights their high comparability.

Figure 2 visualizes average *polity*2 scores for the baseline sample, indicating that the average quality of political institutions across all countries has been rising (Panel A), with a particularly rapid increase over the late 1980s and early 1990s. Assessing the trend by region (Panel B) shows that much of this rise is due to striking advances in institutional quality in both Eastern Europe and Africa over this period.

Of course, examining *average* trends in institutional quality cannot offer much insight regarding income *inequality* and so this is precisely where decomposing the standard Gini finds its worth. With this in mind, we now turn to discussing our methodological approach.

[11] *polity*2 is a modification of the annual *polity* score, formed to facilitate the use of *polity* in time-series analyses (Marshall et al., 2014). In forming *polity*2, the authors (Marshall and Jaggers, 2002) apply a "fix" to *polity* that "converts instances of standardized authority codes (i.e. −66, −77, and −88) to conventional polity scores" (i.e. ranging between −10 and +10), which explains the greater availability of *polity*2 in contrast to *executive constraints*.

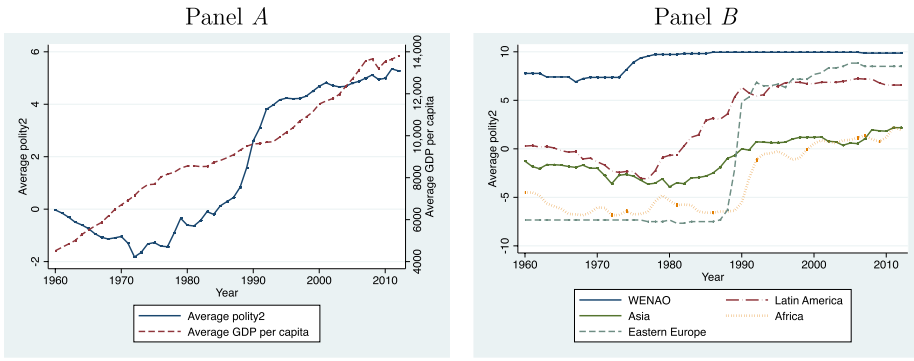

Figure 2. Panel *A*: Average *GDP per capita* and institutional quality (*polity*2) for all 95 countries from 1960 to 2012. Panel *B*: Average institutional quality (*polity*2) by region for all 95 countries from 1960 to 2012.
[Colour figure can be viewed at wileyonlinelibrary.com]

4. Methodology

4.1. *Adjusted Ginis: Background*

The standard Gini coefficient measures inequality by comparing the actual distribution of income between agents (in this case, countries) to a reference distribution where total income is shared evenly. However, inequality does not necessarily need to be measured with reference to this egalitarian distribution of income. Instead, Almås et al. (2011) propose a generalized framework for measuring inequality that is calculated in reference to a new, adjusted income distribution. Under this new reference point for "perfect equality" (i.e. a Gini of zero), countries need not have equal incomes. Rather, countries' "adjusted incomes" account for differences in any variables that are included in their set of what Almås et al. (2011) label responsibility factors.[12]

In our main estimation, we consider *polity*2 as a responsibility factor, whereas other factors, most notably geography, remain as non-responsibility factors. This means that any income differences stemming from institutional differences will not be captured in the adjusted Gini but rather provide a reference point for perfect equality. In turn, any income differences we cannot explain (or only explain via geography) will form part of the adjusted Gini.[13] When there is only one

[12]Almås et al. (2011), who assess inequality between individuals in Norway, also provide further details on the generalized framework, including justification that it satisfies the four standard conditions for inequality measures (anonymity, scale invariance, generalized Pigou-Dalton, and unfairism). Almås (2008) offered an earlier application of difference-based Lorenz curves to compare the fairness of income distributions in the United States and Germany. Beyond Almås et al. (2011), the adjusted Gini technique has been used in several other studies of inequality within countries, including Brazil (Figueiredo and Junior, 2014), France (Carpantier and Sapata, 2013), South American nations (Aristizábal-Ramírez et al., 2015), and the United States (Hussey and Jetter, 2016).

[13]Following Almås et al., 2011, a normative interpretation would then label the adjusted Gini as the "unfair" inequality that remains after "fair" inequality (i.e. inequality explainable by political institutions) has been taken into account. While we prefer to avoid a strict normative interpretation in the current context, we maintain the labeling of "responsibility" and "non-responsibility" factors in order to clarify which variables are being included in the Gini adjustment. This labeling also reflects the view that political institutions are determined largely by societies, unlike, in the short term, geography.

determinant within the responsibility set, the difference between the adjusted Gini and standard Gini gives a measure of the portion of inequality which *can* be explained by that determinant. Throughout the paper, we refer to this difference as the contribution of the determinant to inequality or its explanatory power.[14] We will also indicate alternative groupings of responsibility and non-responsibility factors as we consider alternative estimations, e.g. when incorporating cultural factors and education.

4.2. *Adjusted Ginis: Derivation*

The first step in deriving the adjusted income distribution is a standard ordinary least squares regression, estimating per capita income, y_{it}, of country i in year t. Variables representing the fundamental determinants of income levels are grouped into either the responsibility set, x_{it}^{R}, or the non-responsibility set, x_{it}^{NR}. This regression takes the basic form of

$$\log(y_{it}) = \beta x_{it}^{R} + \gamma x_{it}^{NR} + \varepsilon_{it}, \tag{1}$$

where ε_{it} represents the standard error term. Then, to determine the share of world income that each country is allocated under the adjusted income distribution, we adopt a so-called generalized version of the classical proportionality principle (Bossert, 1995; Cappelen and Tungodden, 2017; Konow, 1996), in line with Almås et al. (2011). This stipulates that a country's adjusted income will reflect what the average income would be if all other countries shared the same responsibility factors as that country. Using the results of regression (1) in conjunction with this generalized proportionality principle (GPP), we follow Almås et al. (2011) to define a country's adjusted income, z_{it}^{GPP}, as

$$z_{it}^{GPP} = \frac{\exp(\beta x_{it}^{R})}{\sum_{j} \exp(\beta x_{jt}^{R})} \sum_{j} y_{jt}. \tag{2}$$

For the baseline results, we consider a world where inequality between countries depends on two fundamental determinants: quality of political institutions, as well as geography. In particular, we include *polity*2 into the responsibility set, x_{it}^{R}, and leave the geographical variables (*latitude*, *landlocked*, and *island*) in x_{it}^{NR}. Further, any unobserved or omitted variables (as captured by the error term) are also initially assumed to be non-responsibility factors (Almås et al., 2011). However, we eventually relax this assumption by including proxies for culture and education.

Like the standard Gini, the adjusted Gini is then derived via construction of a Lorenz curve, although this should be thought of as an *adjusted* Lorenz curve. Instead of ranking countries by their cumulative actual incomes as in the case of the standard Lorenz curve, the adjusted Lorenz curve ranks countries by the difference

[14]It should be noted that this method should not be viewed as isolating causal effects of political institutions on inequality. Political institutions may be endogeneous with respect to a country's mean income, and correlated with omitted factors that may help to explain cross-country differences.

between their actual and adjusted incomes (Almås et al., 2011). Accordingly, for a sample of n countries, the adjusted Gini (or unfairness Gini in Almås et al., 2011), G^U, is derived following the equations:

$$G^U = \frac{1}{2n(n-1)\mu} \sum_i \sum_j |u_{it} - u_{jt}|, \tag{3}$$

$$u_{it} = y_{it} - z_{it}^{GPP}, \tag{4}$$

and

$$\mu = \frac{\sum_i y_i}{n}. \tag{5}$$

Note that if for all i, $z_{it}^{GPP} = \mu$, equation 3 is equivalent to the equation for the standard Gini. Thus, if at least one country's adjusted income, z_{it}^{GPP}, differs from the average world income, μ, the adjusted Gini differs from the standard Gini. When the reference distribution is adjusted only to reflect differences in *polity*2 scores, the adjusted Gini represents the portion of inequality that cannot be accounted for by institutional quality.[15] For all sets of results we derive standard and adjusted Ginis, expressing both as 3-year moving averages in order to smooth trends and remove possible effects of business cycles and measurement error. For example, the Ginis attributed to 2000 are calculated by averaging the estimates for 1999, 2000, and 2001 (in a similar way to Solt, 2016). As a final step, we calculate a measure of the contribution of political institutions to inequality by subtracting the adjusted Gini from the standard Gini in each year.[16]

5. Empirical Findings

5.1. *Baseline Results*

Panel *A* in Figure 3 graphs the standard and adjusted Ginis over time, derived from the baseline sample and expressed as 3-year moving averages. The adjusted Gini assumes *polity*2 to be a responsibility factor, whereas geographical factors (*latitude*, *landlocked*, and *island*) form part of the non-responsibility factors. Table 1 presents the full list of all adjusted Ginis, along with measures of their absolute and relative contributions.

[15]It should be noted that, while the standard Gini lies on a scale from zero to one, the adjusted Gini can theoretically range between zero and two (Almås et al., 2011). Nonetheless, while the adjusted Gini point estimates are not entirely accurate "portions" in technical terms, meaningful insights come from comparing the relative size of the adjusted and standard Ginis over time.

[16]This can also be expressed as a relative contribution, that is, as a percentage of the standard Gini. In practice the trends in both absolute contributions and relative contributions are almost identical, so for simplicity we consider absolute contributions as the key indicator of the explanatory power of institutions.

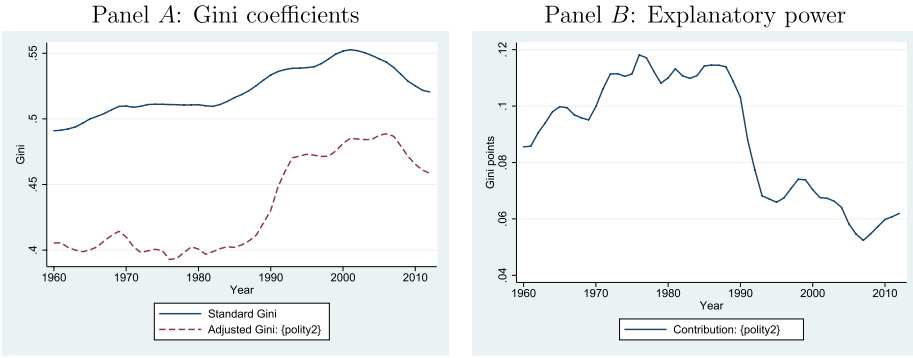

Figure 3. Annual Ginis for all 95 countries from 1960 to 2012.
[Colour figure can be viewed at wileyonlinelibrary.com]

Panel *A* reveals that, generally, the two Gini measures have moved in line with each other over the majority of years. However, there is one notable exception: from 1988 to 1993, the adjusted Gini increased rapidly, shrinking the gap with the standard Gini. Today, the standard Gini is only 6 percent higher than in 1960 (0.491 to 0.521), whereas the Gini adjusted for institutional differences has increased by twice as much (13 percent, 0.405 to 0.459). Thus, the portion of inequality that *cannot* be explained by institutional quality is now substantially larger than it was over the 1960s to 1980s, with this change occurring in the late 1980s and early 1990s.

This key finding is shown in a more intuitive way in panel *B*, which plots the absolute contribution of institutions to inequality, reflecting the gap between the standard and adjusted Ginis. It becomes clear that the explanatory power of political institutions has noticeably decreased from the late 1980s.

Table 1 shows that considering the *relative* contribution of political institutions produces an almost identical trend to the absolute contributions. Using this measure, by 1993, institutional quality could explain 40 percent less of inequality than compared with just five years earlier (0.114 to 0.068). Notably, Milanovic (2005) also focuses on the period from 1988 to 1993, finding a substantial increase in *global* inequality (i.e. between all individuals in the world) over these years. He partly attributes this to rising inequality between countries, in line with economic crises affecting a large number of transition economies. Considering the timing of this rapid drop—coinciding with the end of the Cold War—one might expect changes in Eastern European countries to be driving this downward trend. However, we show in Section 6 that this does not appear to be the case.

Following this rapid drop, the explanatory power of institutional quality does not recover but instead continues to fall, for the most part, over the last few decades. Although the average quality of institutions has been improving over the last two decades (Figure 2), these results suggest that the decreasing inequality seen since 2001 cannot be explained well by differences in countries' political institutions. In fact, today the explanatory power of institutions is near the lowest it has been over the last fifty years.

A natural question that emerges with this assessment is then whether geography, the other fundamental determinant of income levels considered here, has

TABLE 1

STANDARD AND ADJUSTED GINI COEFFICIENTS WITH ABSOLUTE AND RELATIVE CONTRIBUTIONS OF INSTITUTIONAL QUALITY TO INTERNATIONAL INEQUALITY

	1960	**1961**	**1962**	**1963**	**1964**	**1965**	**1966**	**1967**	**1968**	**1969**	**1970**	**1971**	**1972**	**1973**
Standard Gini[a]	0.491	0.491	0.492	0.494	0.497	0.500	0.502	0.504	0.507	0.510	0.510	0.509	0.510	0.511
Adjusted Gini	0.405	0.406	0.402	0.400	0.399	0.400	0.403	0.407	0.411	0.414	0.410	0.403	0.398	0.399
Absolute contribution[b]	0.086	0.086	0.090	0.094	0.098	0.100	0.099	0.097	0.096	0.095	0.100	0.106	0.111	0.111
Relative contribution[c]	0.174	0.175	0.184	0.190	0.197	0.200	0.198	0.192	0.189	0.187	0.196	0.209	0.219	0.218
	1974	**1975**	**1976**	**1977**	**1978**	**1979**	**1980**	**1981**	**1982**	**1983**	**1984**	**1985**	**1986**	**1987**
Standard Gini[a]	0.511	0.511	0.511	0.511	0.511	0.511	0.511	0.510	0.510	0.511	0.513	0.516	0.519	0.522
Adjusted Gini	0.401	0.400	0.393	0.394	0.398	0.402	0.401	0.397	0.399	0.401	0.403	0.402	0.404	0.407
Absolute contribution[b]	0.111	0.111	0.118	0.117	0.112	0.108	0.110	0.113	0.111	0.110	0.111	0.114	0.115	0.114
Relative contribution[c]	0.216	0.218	0.231	0.229	0.220	0.212	0.215	0.222	0.217	0.215	0.216	0.221	0.221	0.220
	1988	**1989**	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**
Standard Gini[a]	0.525	0.530	0.533	0.536	0.538	0.539	0.539	0.539	0.540	0.542	0.546	0.549	0.552	0.553
Adjusted Gini	0.411	0.421	0.430	0.448	0.460	0.470	0.472	0.473	0.472	0.471	0.472	0.476	0.481	0.485
Absolute contribution[b]	0.114	0.109	0.103	0.088	0.077	0.068	0.067	0.066	0.067	0.071	0.074	0.074	0.070	0.068
Relative contribution[c]	0.217	0.205	0.193	0.164	0.144	0.127	0.124	0.122	0.125	0.131	0.136	0.134	0.128	0.122
	2002	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**			
Standard Gini[a]	0.552	0.550	0.548	0.546	0.543	0.539	0.534	0.529	0.525	0.522	0.521			
Adjusted Gini	0.485	0.484	0.484	0.488	0.489	0.487	0.479	0.471	0.465	0.461	0.459			
Absolute contribution[b]	0.067	0.066	0.064	0.058	0.055	0.052	0.055	0.057	0.060	0.061	0.062			
Relative contribution[c]	0.122	0.120	0.117	0.107	0.101	0.097	0.102	0.108	0.114	0.116	0.119			

Notes: Using the baseline sample of 95 countries from 1960 to 2012, where $x_{it}^{R} = \{polity2\}$ and $x_{it}^{NR} = \{geography\}$.

[a]The standard and adjusted Ginis are expressed as 3-year moving averages.

[b]For a standard Gini (G) and adjusted Gini (AG), the absolute contribution is given by $G-AG$.

[c]For a standard Gini (G) and adjusted Gini (AG), the relative contribution is given by $\frac{(G-AG)}{G}$.

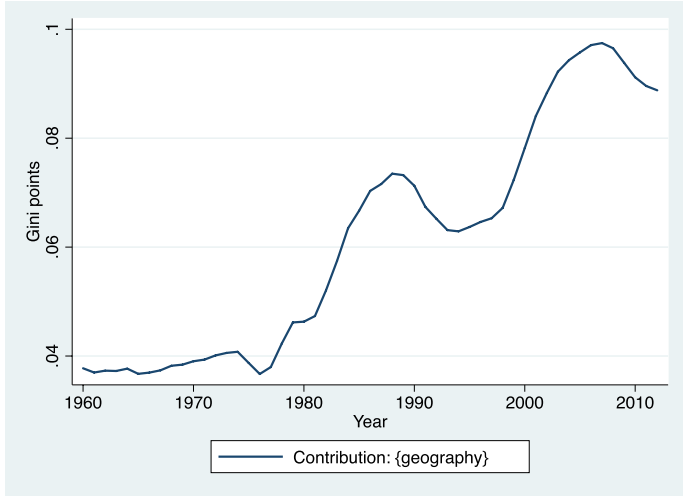

Figure 4. Contribution of geography when considering the baseline sample of 95 countries from 1960 to 2012.
[Colour figure can be viewed at wileyonlinelibrary.com]

become more important to compensate for the declining role of political institutions. Figure 4 visualizes results from considering a hypothetical scenario in which *geography* is moved into the responsibility set, while *polity*2 remains in the non-responsibility set. Thus, any inequalities stemming from our geographical variables (*latitude*, *landlocked*, and *island*) are used to determine the comparison point of zero inequality, whereas inequality explainable by political institutions remains a part of the adjusted Gini.

Figure 4 reveals that, coinciding with the declining explanatory power of institutions, geography has become better in predicting international inequality. In fact, geography today is able to explain approximately twice as much of international inequality as in the early 1980s.

5.2. *Robustness Checks*

Overall, the late 1980s appear to mark a crucial turning point in the extent to which political institutions can account for the distribution of income between countries. However, our primary sample only includes those countries for which data are consistently available dating back to 1960. Today, these countries tend to have marginally higher average levels of *GDP per capita* and *polity*2 scores than is found in a cross-section of all countries. Therefore, to ensure that this baseline sample is not driving the results we consider a shorter time period, from 1980 onwards. This allows for the inclusion of a larger sample of 129 countries, now capturing those for which data were missing for at least one year between 1960 and 1980. This sample represents 93 percent of the world population and includes the 20 most populous countries. As shown in Panel *A* of Figure 5, the key downward trend in the explanatory power of institutions is not unique to the baseline sample. Furthermore, with an even larger sample of 150 countries from 1991 (see Panel *B*),

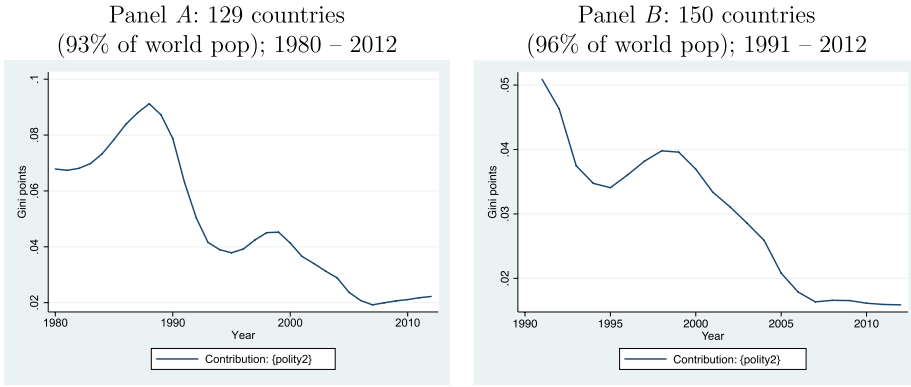

Figure 5. Explanatory power of institutional quality (*polity*2) for international inequality.
[Colour figure can be viewed at wileyonlinelibrary.com]

where data become widely available across Africa, Asia, and Eastern Europe in particular, the main trend continues to hold.

In addition to altering the sample of countries, we investigate robustness to a number of alternative measures for geography, institutional quality, and per capita incomes, with the results shown in Figure 6. First, using the index of *executive constraints* as an alternative indicator of institutional quality allows for a sample of 92 countries (79 percent of the world population) over 1980 to 2012. Shown in Panel *A*, this produces highly consistent trends, with a correlation of 0.981 with the baseline results.

However, given the high correlation between *executive constraints* and *polity*2, we also access the Freedom House index of civil liberties (introduced by Gastil et al., 1991) as another proxy for the quality of political institutions (Scully, 1988; Winiecki, 2004; Mirestean and Tsangarides, 2016). With an extensive sample of 151 countries (95 percent of the world population) over 1983 to 2012, the Ginis adjusted for *civil liberties* also highlight a general downward trend in the contribution of institutions from the late 1980s, as visualized in Panel *B*.

Next, considering that all results so far rely on *latitude*, *landlocked*, and *island* to proxy for geographical differences, we draw *alternative geography* proxies from Gallup et al. (2010), given their use in the associated literature (Gallup et al., 1999; Mirestean and Tsangarides, 2016). Following Gallup et al. (1999), this set of variables consists of (*i*) the share of land in tropical conditions, (*ii*) the mean distance to the nearest sea-navigable river or coastline, (*iii*) the share of land area within 100 kilometers of ice-free coast, (*iv*) the ratio of population within 100 kilometers of navigable river or ice-free coast to the total population, and (*v*) the distance from centroid of country to the nearest sea-navigable river or coast (in kilometers). These variables are summarized in Table A.2 of the appendix. Panel *C* confirms that the key finding prevails when using these alternative variables for *geography*.

Consistent results also prevail when the non-responsibility set is composed solely of *latitude* or, alternatively, when using a set of regional dummies to control for countries' geography (Panels *D* and *E*). Thus, the decreasing explanatory power of political institutions cannot be explained by differences in the physical

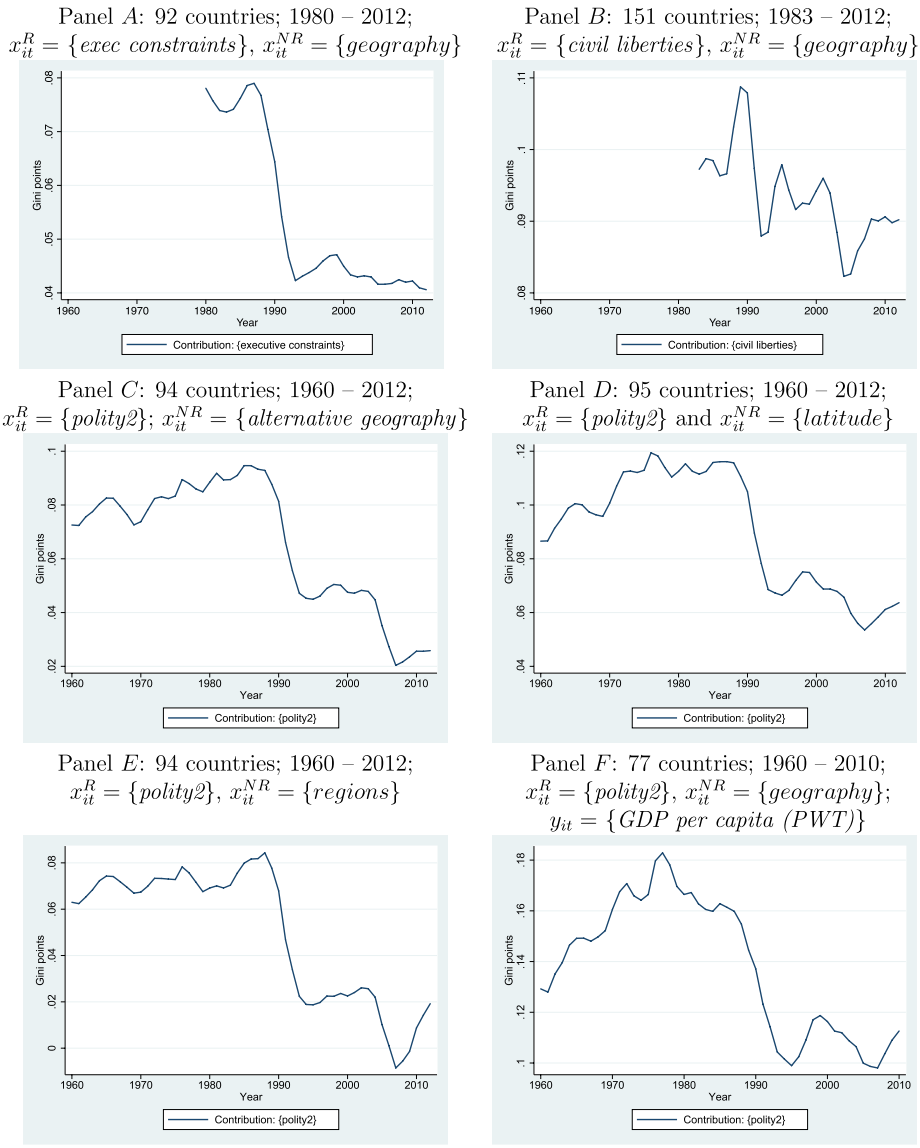

Figure 6. Explanatory power of institutional quality (*polity*2) for international inequality across various robustness checks.
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environment of countries or by region-specific dynamics. Further, we source GDP per capita (PPP, 2005 constant prices) data from the Penn World Table (Heston et al., 2012) and confirm that the baseline results are not sensitive to measuring income inequality using an alternative round of ICP PPP estimates (Panel *F*).

Until now, we have weighted each country equally to calculate Ginis which measure *unweighted* international inequality. Alternatively, if one is concerned with the distribution of income among all *individuals* in the world (global inequality), weighting countries by the size of their population moves one step in this direction.

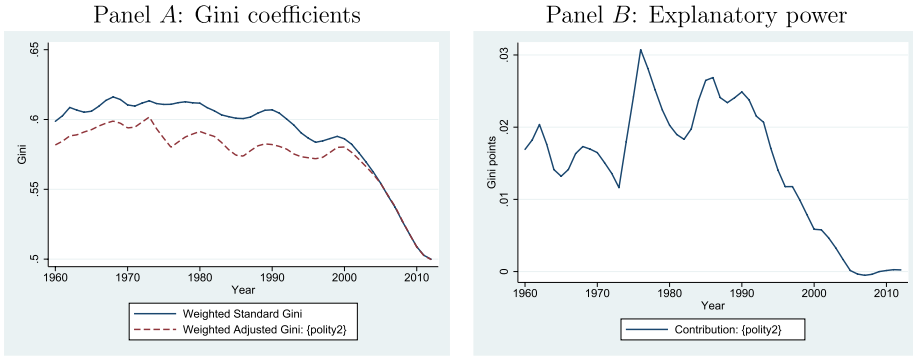

Figure 7. Considering population-weighted inequality, displaying annual Ginis for the baseline sample of 95 countries from 1960 to 2012.
[Colour figure can be viewed at wileyonlinelibrary.com]

Therefore, we also estimate population-weighted standard and adjusted Ginis by expanding the data in proportion to each country's share of total world population in any given year (Figure 7, Panel *A*).

Here, China matters far more than Luxembourg. In line with rapid growth in China, as well as India, the standard Gini fell quickly after 1990. Assessing the contribution of political institutions to this population-weighted inequality by taking differences between the standard and adjusted Ginis, we find that the explanatory power of institutions still declines substantially over the last two decades (Figure 7, panel *B*). Regardless of whether we are concerned with weighted or unweighted inequality, results suggest that over 30 years ago institutional quality was substantially more important for explaining inequality than today.

5.3. *Considering Cultural Attributes and Education*

Having focused thus far on political institutions, we now turn to investigating the explanatory power of cultural attributes and education as additional possible fundamental determinants of income levels. The potential correlation between these factors and political institutions may alter the apparent explanatory power of institutions, and may even help to shed some light on its sharp decline if a corresponding increase in the explanatory power of another factor is found. We consider several alternative proxies for culture and education and allow for all of the alternative orders in which culture, education, and institutions might each be included in the responsibility set.[17]

[17]It is worth briefly mentioning the potential role that international trade (or integration) might play as a "deep" determinant of income levels (Dollar and Kraay, 2004; Rodrik et al., 2004). In keeping with Acemoglu (2008) who views trade as a more proximate factor (where incentives for trade are ultimately shaped by the laws and regulations, i.e. institutions of society), we do not consider trade as a major fundamental determinant. Indeed, Rodrik et al. (2004) note that "one can question whether it is appropriate to treat trade as one of the ultimate determinants of economic prosperity". Regardless, the downward trend in the explanatory power of institutions is still apparent when we control for countries' level of integration using trade to GDP ratios (drawn from The World Bank, 2016; see Figure A.1 in the appendix) or the KOF index of economic globalization (Dreher, 2006; see Figure A.2).

The Role of Culture

Following Acemoglu et al. (2005), we begin by considering culture as a third fundamental determinant, in addition to institutions and geography. Given that a range of cultural attributes have been identified as important for countries' economic development, we use alternative sets of variables to capture a variety of cultural differences across countries. For each of these sets of variables, we first derive the adjusted Gini 1 (AG 1), which is adjusted for institutional differences only, i.e. with cultural attributes and geography remaining in the non-responsibility set. Then, AG 2 is computed, which simultaneously adjusts for both countries' institutional and cultural differences, with only geography remaining in the non-responsibility set.

As a first proxy for countries' culture we employ four *cultural traits* variables, which are drawn from the World Values Survey (WVS) and have been found to be significant for countries' income levels (Guiso et al., 2004, 2006; Tabellini, 2010). These variables capture the extent of "social capital" (*trust* and *respect*) and "confidence in the individual" (*obedience* and *control*).[18] As the WVS does not provide a balanced panel of data, we use the available individual-level responses across all years to generate average measures of these *cultural traits* for each country. These trait variables are therefore assumed to be time-invariant, which is consistent with the notion that many cultural aspects often tend to change slowly over time, if at all (Roland, 2004). Using these four *cultural traits* restricts the sample to 55 countries, which still represents a significant share (79 percent) of the world population.

Lastly, we use the shares of major religions in each country as an alternative, time-variant proxy for national culture (e.g. see Guiso et al., 2003, for the importance of religion in economic development). We access data from the World Religion Dataset (Maoz and Henderson, 2013) to form variables for the percentage of each country's population adhering to *Buddhism*, *Catholicism*, *Islam*, *Judaism*, *Protestantism*, or other *minor denominations*. As data are only available every half-decade, results are restricted to 11 observations over the period of 1960 to 2010. In the corresponding results, the contribution of institutions still falls substantially from the late 1980s onwards (Figure A.7).

The Role of Education

We next control for cross-country differences in education, accessing data from Barro and Lee (2013). Here, we consider education in line with Glaeser et al. (2004), who attest to the primacy of human capital as a basic source of economic growth (also consistent with the arguments of Barro, 1999, and Przeworski, 2000). Initially, we employ a measure of *secondary education* attainment. Moving the *secondary education* variable into the responsibility set allow us to derive AG 3, which estimates the inequality between countries that cannot be explained by differences in political institutions, culture, or education.

[18]Each of these *cultural traits* is categorical and reflects the answers of a representative sample of individuals from each country. For example, *trust* records responses to the question "Generally speaking, would you say that most people can be trusted or that you can't be too careful in dealing with people?" (World Values Survey, 1981). WVS data have been reported in six waves, with the first from 1981 to 1984.

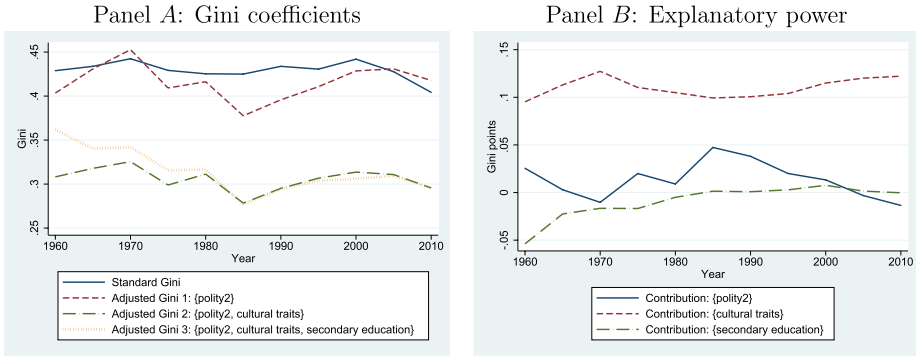

Figure 8. Ginis every five years for 53 countries (75% of world population) from 1960 to 2010, where AG 1: $x_{it}^{R} = \{polity2\}$ and $x_{it}^{NR} = \{cultural\ traits, secondary\ education, geography\}$; AG 2: $x_{it}^{R} = \{polity2, cultural\ traits\}$ and $x_{it}^{NR} = \{secondary\ education, geography\}$; AG 3: $x_{it}^{R} = \{polity2, cultural\ traits, secondary\ education\}$ and $x_{it}^{NR} = \{geography\}$. [Colour figure can be viewed at wileyonlinelibrary.com]

Data availability from Barro and Lee (2013) allows us to compute Ginis for a sample of 53 countries (75 percent of the world population), for every fifth year over 1960 to 2010. The corresponding results are displayed in Figure 8. Even with the smaller sample of countries, our established result of a declining role of political institutions prevails (AG 1). In fact, the adjusted Gini with only strength of political institutions in the responsibility set reaches its minimum (maximum explanatory power) in the mid-1980s and increases to actually meet or exceed the normal Gini coefficient in the last decade. By comparing successive adjusted Ginis, we gain some insight into the respective contributions of each additional determinant (Panel B). The addition of cultural traits to the responsibility set results in a substantially lower adjusted Gini. However, its explanatory power has remained relatively constant over time, with only a small but steady increase in recent years. Most notably, the sharp decline in unexplained inequality remains in the 1980s and follows the same trend since that time. The addition of education to the responsibility set carries no impact on our adjusted inequality measure from 1980 onward (and actually serves to increase the adjusted Gini prior to that time).

Additionally, the downward trend in the explanatory power of institutions is apparent when using the average number of *school years*, *primary education* attainment, or *tertiary education* attainment as alternative indicators within the non-responsibility set (Figure A.8).

The apparent contribution of each determinant may also vary, depending on the order in which determinants are moved into the responsibility set. Consequently, we derive results for all five alternative arrangements of the proxies for political institutions, culture, and education. Figure A.9 shows that regardless of the order of inclusion, differences in institutional quality consistently explain less of inequality today, compared to three decades ago.

The results from this expanded specification again imply that between country inequality that cannot be explained by institutional quality has increased since the late 1980s. However, it is worth noting that the inequality that cannot be explained by institutional quality, cultural attributes, and education together has remained

similar, or slightly decreased. This appears to be due to the fact that while the ability of political institutions to explain inequality across countries has decreased, the marginal explanatory power of the other two factors may have increased. That is, we observe some limited evidence that the declining role of political institutions may have been partially replaced by other factors, in particular cultural traits and, to a lesser degree, education. A counterpart to the dramatic decline in the explanatory power of political institutions often observed around the late 1980s is not found in these other factors, however.

6. Regional Explanations

To test whether the decline in the importance of political institutions for international inequality is being driven by major regional events, we consider three main developments over the late 1980s and early 1990s: the fall of the Soviet Union, the rise of China and other Asian success stories, and institutional monocropping in Africa.

6.1. *The Fall of the Soviet Union*

First, we turn to the fall of the Iron Curtain. Given that a "significant acceleration of the convergence process [in institutional quality] resulted from the end of the Cold War" (Savoia and Sen, 2016), one might speculate that the rapid drop in the explanatory power of institutions over 1988 to 1993 could be due to the coincident transitions in a number of Eastern European countries. To test this explanation, we remove Eastern Europe from the baseline sample, forming a new sub-sample of 89 countries.

Panel *A* in Figure 9 compares the results from this sub-sample with the baseline results for all 95 countries. If changes in Eastern Europe were driving the decreased explanatory power of institutions, one would expect the rapid drop to disappear in the new results. However, this is not the case. The contribution of institutions in fact falls by even more when Eastern European countries are not in the sample. Thus, the declining importance of institutions for inequality is not simply a result of institutional improvements in Eastern Europe following the collapse of the Soviet Union.

6.2. *The Rise of China and Asian Growth*

A second potential explanation focuses on the rise of China and a number of other Asian success stories that enjoyed high growth rates prior to and around the 1990s. Indeed, the extraordinary rise of China has provided one force for economic convergence between countries. And yet, by conventional measures, China has maintained relatively low quality political institutions over this period (Rodrik, 2003). Thus, it is possible that the inability of political institutions to explain Chinese growth could drive our benchmark finding.

Panel *B* of Figure 9 excludes all Asian countries from our sample. But, here again, the drop in the explanatory power of political institutions prevails, as highlighted in the right graph of Panel *B*. Although the drop decreases marginally in terms of its magnitude, we still observe the same tendency, especially

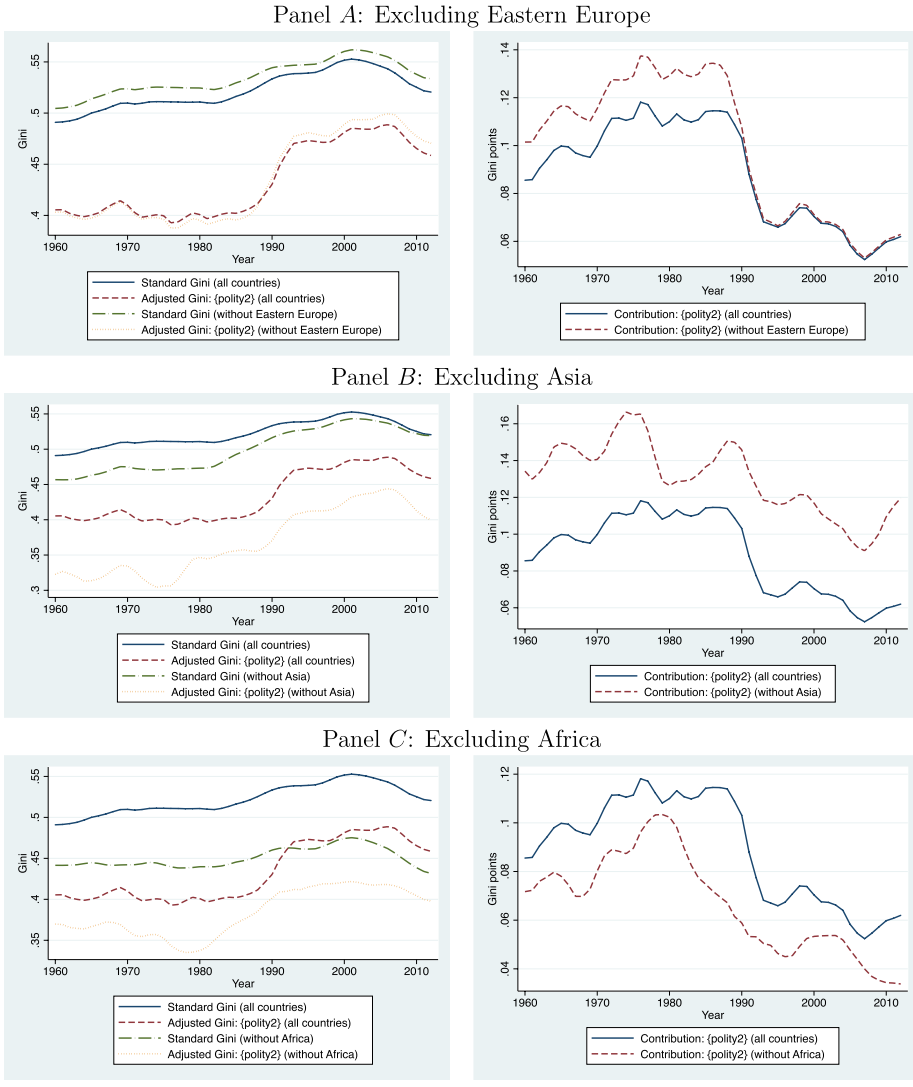

Figure 9. Excluding particular regions, showing the adjusted Gini (left) and the corresponding explanatory power of *polity*2 (right), where $x_{it}^{R} = \{polity2\}$ and $x_{it}^{NR} = \{geography\}$. [Colour figure can be viewed at wileyonlinelibrary.com]

when considering the period following the 1990s—political institutions continue to explain less of international inequality and Asia does not seem to be the unique driver for this development.

6.3. *Institutional Monocropping in Africa*

A final possible explanation considers "institutional monocropping", a term coined by Evans (2004) to refer to the imposition of uniform institutional blueprints upon the global South. As this concept may be less well-known than our first

two explanations, we briefly provide a historical background. In line with a number of "best practice" reforms prescribed by the Washington Consensus (Dunning and Pop-Eleches, 2004), the 1990s saw particularly rapid transplantation of what were presumed "ideal" Anglo-American institutions onto many developing economies (Evans, 2004; Savoia and Sen, 2016). However, this institutional monocropping often did not result in the expected improvements to economic performance (Evans, 2004; Chang, 2007). While monocropping saw institutional quality quickly "improve", it did not generate matching changes in countries' income levels. In this way, monocropping might be one factor leading to the decreasing explanatory power of institutions for international inequality.

This monocropping explanation appears even more plausible once we consider why it produced such disappointing results. One explanation for the poor economic returns is that there was ineffective enforcement of the correct functioning of the imposed institutions on behalf of the government (Khan, 2012). This would suggest a disparity between "official" measures and the actual quality of institutions in these countries, which might explain the decreasing explanatory power of institutions. However, a more widely supported explanation is that the cultural and social context of the recipient countries was typically not accounted for and was not conducive to the success of the imposed institutions (Djankov et al., 2003; Roland, 2004; Rodrik, 2008). Zweynert and Goldschmidt (2006) explain that "if formal institutions are transferred from one country to another, they mingle with the 'soil' of the prevailing informal constraints of behavior." Acemoglu et al. (2005) also acknowledge that, to some extent, culture may influence the outcomes of a set of institutions. Thus, the blueprint reforms may have underestimated the importance of local knowledge and "supporting norms" for building successful institutions (Rodrik et al., 2004; Rodrik, 2006).[19]

Given evidence of rapid institutional monocropping in Africa around the early 1990s (Mkandawire, 2012) and the methodological difficulty of listing exactly those countries in which institutional monocropping was particularly enforced, we focus on Africa. Panel *C* of Figure 9 presents results when this continent is excluded from our global sample. Overall, we continue to observe the continuous downward trend in the role of political institutions. In fact, once African countries are excluded from the sample, this development sets in even earlier around the early 1980s, as can be seen in the right graph of panel *C*. Thus, if anything, Africa appears to have delayed the declining role of political institutions in explaining international inequality.

Overall, these three major global events—the fall of the Soviet Union, the rise of Asia, and institutional monocropping—appear unlikely as the sole drivers of the declining importance of political institutions to explain international inequality.

[19]For example, regarding monocropping in Africa, Mkandawire (2012) contends that the "practice has blunted the effectiveness of institutions by denying them context specificity." Dunning and Pop-Eleches (2004) cite Botswana, China, and Mauritius as contrasting examples, which illustrate the importance of context-specific institutions, as opposed to "universal recipes" for success.

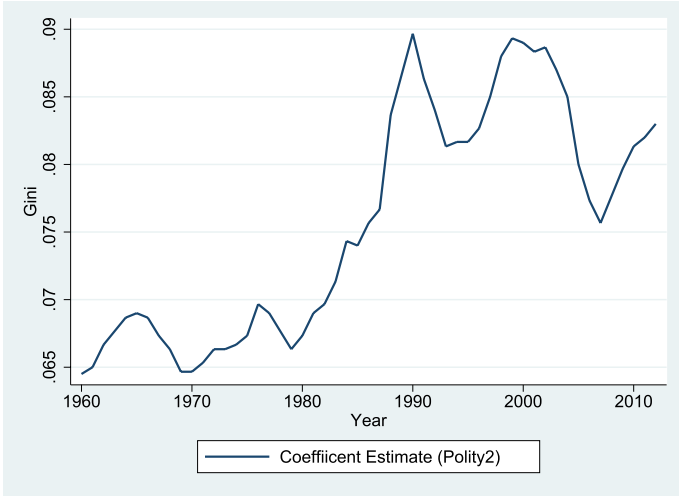

Figure 10. *Polity*2 coefficient estimate by year from 1960 to 2012, from regressions of *ln*(*GDP*/*capita*) on *polity*2 and geography variables. Displaying three-year moving averages.
[Colour figure can be viewed at wileyonlinelibrary.com]

7. Functional Explanations in the Link Between Institutions and Income

In this section, we further explore the nature of our findings and possible channels. The focus of our analysis is explaining inequality between countries, rather than explaining levels of GDP/capita or economic growth. As both the standard and adjusted Ginis are distributional statistics, the role of political institutions in explaining inequality can change over time due to two reasons: (*i*) a change in the explanatory power of institutions for income or (*ii*) a change in the functional form on how political institutions relate to income.

7.1. *A Change in the Polity2-GDP/Capita Relationship?*

To investigate possibility (*i*), we predict *ln*(*GDP*/*capita*) with *polity*2 in a conventional cross-country regression analysis for each year throughout our sample period. All regressions control for the familiar set of geographical covariates. Figure 10 visualizes the resulting coefficients. Interestingly, the coefficient associated with polity, always highly statistically significant, *increased*, most notably in the late 1980s. Thus, the role of institutions in explaining income levels remained strong.

7.2. *A Change in the Functional Relationship Between Polity2 and GDP/Capita?*

Given that the relationship between GDP/capita and institutional quality has been *increasing* in magnitude, we now further investigate possible heterogeneity in this relationship by allowing for non-linear effects of *polity*2. Intuitively, the "returns" to better institutions (in the form of economic growth) may differ between low and high *polity*2 values, perhaps differently so since the 1990s. In other words, a, say, three-point change along the *polity*2 scale may not always be

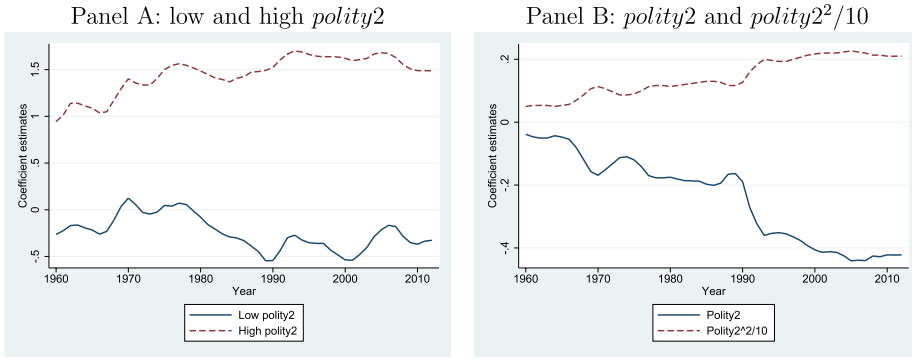

Figure 11. Panel A: Displaying coefficients of low (below 25th-percentile) *polity*2 and high (above 75th-percentile) *polity*2 from regressions predicting *ln*(*GDP*/*capita*). Panel B: Displaying coefficients of *polity*2 and *polity*2^2/10 from regressions predicting *ln*(*GDP*/*capita*).
Note: All yearly regressions include the familiar set of geography variables and we display three-year moving averages.
[Colour figure can be viewed at wileyonlinelibrary.com]

associated with the same quantitative adjustments in GDP/capita. For example, moving from a complete autocracy to a moderate autocracy may not be the same as moving from a moderate democracy to a complete democracy.

We explore such nonlinearity in two ways. First, we run repeated cross-sectional regressions with indicator variables for high polity (top quartile) and low polity (bottom quartile), with the results shown in Panel A of Figure 11. The corresponding results reveal that the effect of high polity has increased by over 50 percent over the sample period, while the (generally negative) effect of low polity has varied but overall remained relatively similar. In other words, good institutions appear to gain more dividends today than at the beginning of our sample.

Second, we run regressions including both *polity*2 and *polity*2^2, with the coefficient estimates visualized in Panel B of Figure 11. (We first re-scale the *polity*2 variable to range from zero to 20, in order to properly calculate squared values. We then divided the *polity*2^2 variable by 10 for clearer graphical comparison to the linear coefficients.) The results show a consistent picture: the returns to political institutions increase at the top end, i.e. the positive coefficient associated with *polity*2^2 has become larger. Further, the linear coefficient on *polity*2 has dropped substantially. Interestingly, both deviations increased substantially around 1990, which is precisely the period where our main results pertaining to global inequality emerge.

8. Discussion and Future Research

What do our findings related to the increasingly nonlinear relationship between institutions and GDP/capita imply in practice? One interpretation is that the traditional bounds of the *polity*2 measure do not provide enough variation, especially at the top end, to bring out institutional differences that matter for income levels. Another interpretation is that the returns to institutional quality in terms of GDP/capita have indeed become more nonlinear, i.e. a three-point move on the *polity*2

scale does not provide the same returns for GDP/capita throughout. And, more specifically, this nonlinearity has largely emerged since the 1990s. Future research should further explore these avenues.

Some caveats regarding our results should be noted. First, inequality between countries is only one (albeit large) component of global inequality. Future studies may seek to incorporate data regarding *within*-country inequality in order to provide a more complete picture, or combine within- and between-country inequality. While some recent studies, such as Milanovic (2015), use the World Income Inequality Database to evaluate global inequality, to our knowledge none have aimed to decompose these global measures based on fundamental determinants, potentially due to data limitations, especially over long time frames and a comprehensive set of countries.

Second, we focus on the *fundamental* determinants of income levels; thus, exploring the role of *proximate* determinants (e.g. factor accumulation and productivity) in explaining international inequality might produce more detailed insights. Related to this, we caution that the approach used in this paper does not eliminate the possibility of omitted variables from influencing our results, similar to most if not all studies related to explaining income levels on a global scale. Finally, we also point out that reverse causality can always be a concern: richer countries may choose higher *polity*2 levels. To the extent that these concerns likely prevail throughout the entire sample period, it is difficult to imagine how these endogeneity concerns, if present, may have changed systematically just around the 1990s. Nevertheless, we cannot exclude that possibility and any interpretations of our findings should keep that in mind.

9. Conclusion

This paper examines the role of political institutions as a fundamental determinant of income inequality between countries. If we are concerned with the question of whether developments in international inequality are man-made, then distinguishing between the role of "humanly-devised" political institutions and exogenous geographical conditions can provide us with a more detailed picture than analyzing standard Gini indices or other basic measures of income inequality.

To this end, we derive adjusted Gini coefficients, which capture the part of inequality that *cannot* be attributed to differences in political institutions. We find that since the late 1980s it has become increasingly difficult to explain inequality between countries with political institutions. Just 30 years ago, institutions could explain almost twice as much of inequality than they can today, according to baseline estimates analyzing 95 countries (covering 85 percent of the world population). Although international inequality has been decreasing over the new millennium, this does not seem to be explained well by differences in institutional quality. This result remains robust when considering (*i*) a larger sample of countries (over a shorter time frame), (*ii*) alternative variables, (*iii*) population-weighted inequality, or (*iv*) additional fundamental determinants of income (culture, education, and geography). In turn, the explanatory power of geography has doubled since the 1980s.

We then consider three contemporary historical events as potential explanations of this phenomenon: the fall of the Soviet Union, the rise of China and other Asian success stories, and institutional monocropping. However, neither excluding Eastern Europe, nor Asia or Africa, produces qualitatively different insights, suggesting that the decline in the explanatory power of political institutions for international inequality since the late 1980s is indeed a global phenomenon. This finding implies that institutional quality now matters less for improving international inequality.

Further analysis shows that while the relationship between institutional quality and GDP levels has remained relatively low for the majority of countries, there has been an *increase* in the impact of political institutions on GDP for countries in the upper quartile of institutional quality, such as those often found in Western nations over the last half-century. Thus, our results suggest that the declining role of political institutions in explaining global average income inequality is due to an increasingly non-linear relationship between polity and GDP, with this relationship becoming more pronounced in WENAO countries that tend to have experienced relatively high growth and consistently high quality of institutions.

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Supporting Information

Additional supporting information may be found in the online version of this article at the publisher's web site:

Appendix 1

Figure A.1: Explanatory power of institutional quality (polity2), cultural traits, secondary education and trade to GDP for international inequality

Figure A.2: Explanatory power of institutional quality (polity2), cultural traits, secondary education and economic globalisation for international inequality

Figure A.3: Explanatory power of institutional quality (polity2) and cultural traits for international inequality

Figure A.4: Explanatory power of institutional quality (polity2) and cultural traits for international inequality. Alternative ordering of inclusion in the responsibility set

Figure A.5: Explanatory power of institutional quality (polity2) and cultural dimensions for international inequality

Figure A.6: Explanatory power of institutional quality (polity2) and individualism for international inequality

Figure A.7: Explanatory power of institutional quality (polity2) and religions for international inequality

Figure A.8: Explanatory power of institutional quality (polity2), cultural traits and alternative proxies for education level

Figure A.9: Explanatory power of institutional quality (polity2), cultural traits and secondary education for international inequality. Alternative orderings of the responsibility set. Contributions every five years; 53 countries (75% of world population); 1960–2010

Appendix 2

Table A.1: Baseline sample of 95 countries and their polity2 scores

Table A.2: Summary of variables (1 of 2)

Appendix 3: Additional background