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Does Economic Freedom Boost Growth for Everyone?

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Abstract: While the association between economic freedom and long-run economic growth is well documented, the parallel research literature on the distributional consequences of economic freedom is full of conflicting findings. In this paper, we take a step towards reconciling the two literatures by exploring the within-quintile growth consequences of changes in three different types of economic freedom: the size of government, institutional quality and policy quality. While the associations are theoretically ambiguous, we find evidence that economic freedom affects all parts of the income distribution equally, and some indications that the growth effects are largest for the poorest and richest quintiles.

JEL Codes: O40, O43, P16

Keywords: Economic freedom, liberalization, economic growth, income inequality

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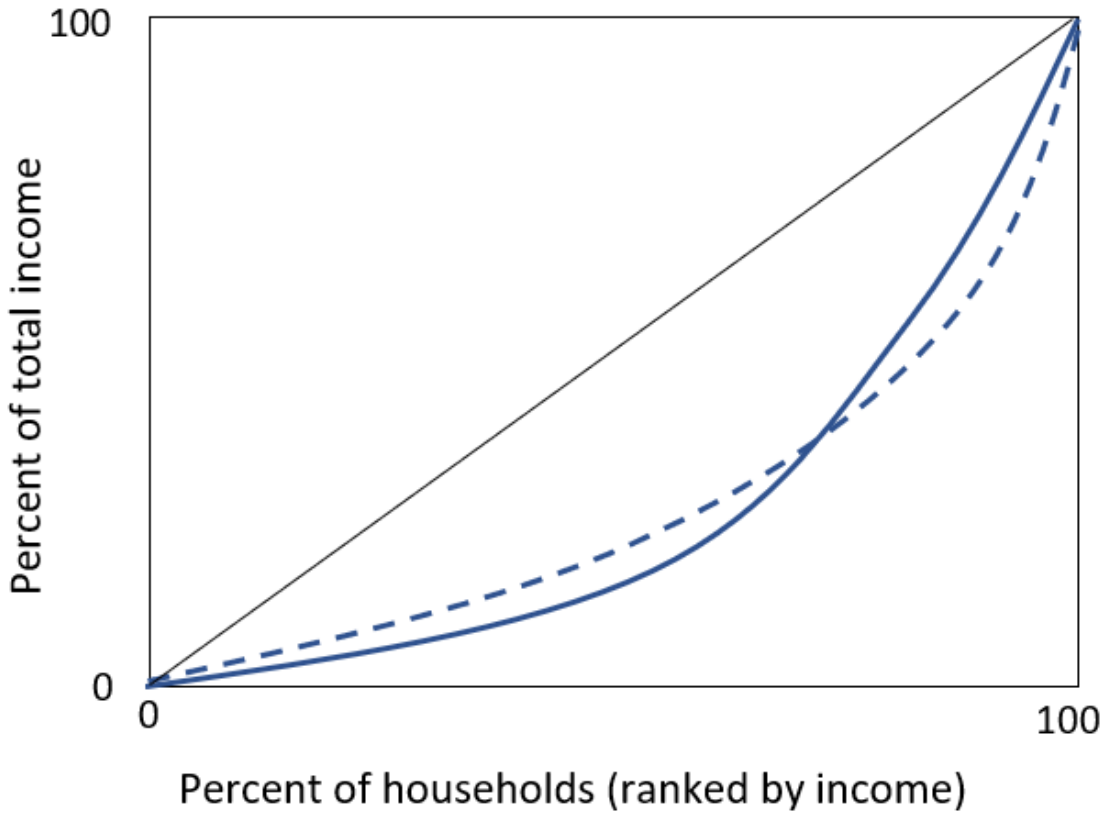
1. Introduction

The positive association between economic freedom and economic growth is well-documented (Ayal et al. 1998; Heckelman and Stroup 2000; Compton et al. 2011; Doucouliagos et al. 2006; Gwartney et al. 1999; Hall and Lawson, 2014; Rode and Coll 2012; Williamson et al. 2011; Xu et al. 2008), as is its relation with overall productivity (Klein and Luu 2003; Zhang et al. 2018). Approaches based on Granger causality and using instruments for economic freedom also suggest that the association at least partly reflects a causal effect of economic freedom on growth (Dawson 2003; Heckelman 2000; Justesen 2008; however see also Sturm et al. 2002). By now, there is also a growing body of micro-level evidence of the effects of specific reforms that increase economic freedom, suggesting that such reforms can causally affect firm-level productivity (e.g. Bjuggren 2018; Schivardi and Viviano 2011).

In contrast, the research on the distributional consequences of economic freedom is full of conflicting findings. After the field started with Berggren (1999), several studies have documented a negative association between economic freedom and income inequality (Bergh and Nilsson 2010; Carter 2006; Scully 2002). These studies typically report results that differ depending on the type of economic freedom, on the level of development or other types of heterogeneities (cf. Bennett and Nikolaev 2017). The heterogeneity between democracies and autocracies is of particular interest given recent political debates. Reich (2009) for example claims that capitalist institutions and policies consistent with economic freedom undermine democracy, and equates democratic institutions with substantial redistribution. Similarly, Piketty (2014) claims that capitalism without substantial redistribution and regulatory activity will lead to more inequality by allowing the richest segments of society to grow economically and politically apart from the rest.

This paper contributes by noting that a robust association between economic freedom and a unidimensional metric of income inequality such as the Gini-coefficient is unlikely to exist if economic freedom associates differently with income growth at different parts of the income distribution. For example, economic freedom may plausibly lead to disproportionally higher incomes at the top of the distribution by increasing the returns to capital or certain skills, while at the same time favoring low-income earners by lowering barriers to entry and promoting competition. If that is the case, more economic freedom will change the shape of the Lorenz-curve as illustrated in Figure 1, with ambiguous consequences for the Gini-coefficient (as the Gini-coefficient by definition is twice the area between the 45-degree line and the Lorenz-curve, see e.g. Lambert 1993).

Figure 1. Lorenz curve before (full) and after (dashed) a disproportional income increase at the bottom and at the top.



Until recently, reliable, global cross-country data on income growth at different points in the income distribution was not available. A few studies examined how the Economic Freedom of North America (EFNA) associated with income growth at different points in the US income distribution. Compton et al. (2014) found that increases in the EFNA index exert a positive and significant impact on the growth of mean household income for the top four quintiles, and a positive but insignificant impact on the bottom income quintile. Wiseman (2016), however, found that increases in economic freedom are associated with larger income growth rates for the bottom 90% of income earners relative to the top 10% (and also that the relationship between economic freedom and income inequality is negative and statistically significant). Also analyzing US states, Ashby and Sobel (2008) found that changes in economic freedom are associated with lower income inequality and increases in both levels and growth across all incomes. The potentially more precise state-level literature thus appears as mixed as the cross-country studies.

In this paper, we shed new light on these conflicting findings by examining the association between economic freedom and income growth at different points in the income distribution using (for the first time in this context) new data compiled by Lahoti et al. (2016) in the Global Consumption and Income Project (GCIP). The project uses available data from a large set of credible sources on the relative distribution and mean income for a country in each year since the 1960s and fills in the gaps using interpolation. The resulting database allows us to calculate within-quintile national income, and thus also growth rates of within-quintile income for 145 countries since the early 1970s. We match these data with data on economic freedom to estimate whether changes in economic freedom give rise to systematically different income growth rates for individuals within each of the five income quintiles. In general we find that changes in economic freedom are associated with higher income growth for all quintiles, though there are some signs that the effect for the highest quintile is smaller in autocracies, in particular autocracies with limited veto institutions.

The paper proceeds as follows: Section 2 provides a set of theoretical considerations, based on previous studies. Section 3 describes the data used in section 4 where we estimate growth effects of economic freedom for each quintile. Section 5 concludes.

2. Theoretical expectations and related literature

A lot of the research on economic freedom relies on the Economic Freedom of the World Index published yearly by the Fraser institute (Gwartney et al. 2017). Since the first publication of the index in 1995, the economic and social consequences of economic freedom has become a rapidly growing research field, as indicated by surveys such as Berggren (2003) and Hall and Lawson (2014). While early papers often treated economic freedom as a unidimensional concept, several scholars have focused on differences between different types of economic freedom (Bergh 2018; Heckelman et al. 2005; Ott 2018; Rode and Coll 2012). Perhaps most importantly, economic freedom in the sense of having limited government (area 1) correlates only weakly with other types of economic freedom while another important difference is between economic freedom of institutions and economic freedom of policies. For these reasons, results based on the aggregate index can be hard to interpret. In the empirical section, we therefore choose to follow previous studies in separating government size (area 1) and institutional quality (area 2) while treating results with policy quality (area 3 to 5) as a robustness test.

A second challenge is that the causal association between a numerical index of economic freedom and economic growth is admittedly difficult to establish beyond the Granger causality tests employed in studies like Dawson (2003) and Justesen (2008), and IV-estimations such as those in Faria and Montesinos (2009). There are, however, several examples of specific reforms that have been evaluated using sophisticated identification strategies. While the main purpose of the present paper is to examine if the association between economic freedom and income growth differs across the income distribution, a discussion of credibly identified evaluations of reforms is a useful starting point, both because they illustrate what kind of reforms higher economic freedom entails and because they feed into the discussion regarding distributional impact of such reforms. In doing so, we follow the conceptual distinction between components of economic freedom by organizing the discussion around 1) government size; 2) institutional quality; and 3) policy quality.

Area1: Government size.

Who benefits from limiting or expanding government size? The effects of changes to overall government expenditure depends on the distributional profile of funds allocated by the public sector, and the dynamic effects of the changes. One might expect public expenditure to be targeted towards low-income earners, but the largest welfare states tend to be universal rather than targeted (Korpi et al. 1998), engaging a lot in intra-individual redistribution (Bergh 2005) and be influenced by political economy mechanisms such that funds will tend to benefit the median or the pivotal voter (e.g. Goodin et al. 1987).

Examining the relationship between government size and income inequality in 35 African countries, Odedokun et al. (2004) find that smaller government need not increase income inequality. Yet, if the size and scope of government affect growth, the indirect effects of changes in government size may well be substantial. Bergh and Henrekson (2011) survey studies of the relationship between government size and growth and conclude that there are theoretical reasons to expect a positive association in poor countries and a negative one in rich countries.

While empirical studies are roughly in line with these expectations, identification of the causal impacts of changes in government size on real income growth complicated by endogeneity problems. For changes of specific taxes, studies with credible identification strategies do exist. One example is Ljungqvist and Smolyansky (2014) who exploit variation in corporate income tax rates across U.S. states, comparing contiguous counties straddling state borders. The spatial-discontinuity approach permits a causal interpretation of their findings that increases in corporate tax rates lead to significant reductions in employment and income. Interestingly, the results are not entirely symmetrical: the authors only find evidence that corporate tax cuts boost employment and income if implemented during recessions. Rosholm and Skipper (2009) instead focus on the effects of active labor market policies, which almost all large welfare states implement as a way to reduce unemployment among relatively low-skilled groups. They nonetheless find evidence from Denmark that such policies actively increase individual unemployment rates and reduce the employability of those enrolled in such programs. As such, many similar welfare state policies may have adverse distributional consequences.

Area 2: Institutional quality

Theoretically, there are several reasons to expect large inequalities to be associated with inferior institutions. Lacking rule of law is typically assumed to favor asset stripping over value building (Hoff and Stiglitz 2004). You and Khagram (2005) noted that rich interest groups and firms may use bribery or connections to influence both law-implementing processes as well as interpretations of the law. Sonin (2003) suggested that poor protection of property rights may actually be relatively more beneficial to those already rich, resulting in greater inequality.

A key feature of well-functioning institutions is to lower transaction costs (Davis and North 1971; North 1990). If transactions costs are approximately constant for all transactions (or at least do not increase in proportion to the value of the transaction), they are arguably more problematic for low-income earners. A well-known example is de Soto's (2000) description of how dysfunctional (or entirely absent) property rights institutions often create unsurmountable problems for the poorest population segments in developing countries. There is also evidence that low-income earners are more likely to have to pay bribes (Justesen and Bjørnskov 2014).

The causal effects of rule of law and property rights are difficult to pin down, and the survey by Lambsdorf (2006) mentions inequality as both a cause and a consequence of corruption. Still, some informative studies exist. The causal effect of successfully fighting corruption has been studied by Svensson and Reinikka (2005) using a (successful) newspaper anti-corruption campaign in Uganda. They identified a positive effect from lower corruption on school enrollment and student learning.

A natural experiment regarding property rights occurred in 1984 when some – but not all – squatters in Buenos Aires were given formal property rights to their land. As shown by Galiani and Schargrodsky (2010) these property rights had positive effects on housing investment and child education.

Area 3-5: Policy quality

Area 3 is another area where improvements should in theory benefit low-income earners relatively more. Inflation is typically regarded as more harmful to relatively poorer segments of society, as the value of land and physical property is not as affected by inflation as income from other sources and wealth held in other forms. The value of human capital, for example, is likely to be affected in the same way as the marginal product of labor once inflation reaches

a level at which it is not sufficiently foreseeable. Theoretically, inflation can therefore be seen as a regressive consumption tax (Erosa and Ventura 2002), and empirical cross-country evidence confirms a positive association between inflation and income inequality (Albanesi 2007).

For area 4, freedom to trade internationally, the distributional consequences are more complex, both in theory and empirically. According to standard trade theory, as reflected in the Stolper–Samuelson theorem, economic openness may lead to lower income inequality in developing countries where production is typically labor intensive and capital scarce. The same logic suggests that in rich countries, trade openness will increase the returns to capital and to high-skilled labor. In new trade theory, however, theoretical implications are less clear and the empirical evidence is also mixed (Harrison et al. 2011; Marsh 2016).[1]

Several studies suggest that economic openness impacts prices and productivity (Alcvala and Ciccone 2004; Auer et al. 2013; Auer and Fischer 2008). Improved labor market matching has been identified as an important mechanism in the link from openness to productivity (Davidson et al. 2014). In rich countries, the trade induced changes to consumer prices typically favor the poor because they spend relatively more in more traded sectors (Fajgelbaum et al. 2016). Most studies (including this one) will, however, fail to capture such effects because real incomes in official statistics are calculated using the same price index for all income earners (as discussed by Deaton and Muellbauer 1980).

Finally, a negative association between regulation and productivity has been documented several times, for example by Gray (1987) studying manufacturing industries in the US between 1958 and 1978. A review of both theory and evidence on how regulation affects productivity is provided by Crafts (2006). More recent studies have made progress in identification of causal effect: Using a minor reform of the Swedish labor market, Bjuggren (2018) shows that more flexible rules regarding the hiring and firing of workers, increases labor productivity (through factor productivity and capital intensity).

In summary, both theory and empirical provide support for a causal link from increases in economic freedom to income growth, but do not give any clear indication regarding the distributional profile.

[1] As the survey in Harrison et al. (2011) notes, the effects of trade liberalization theoretically depend on a number of factors including the flexibility of labor market institutions, specific firm dynamics and geographical mobility.

3. Data and empirical strategy

We employ the recently available data on income distributions from the Global Consumption and Income Project (GCIP, Lahoti et al. 2016). Using data from the Luxembourg Income Study (LIS), the Socio-Economic Database for Latin America and the Caribbean (SEDLAC), the European Union Statistics on Income and Living Conditions (EU-SILC), the World Bank's Povcalnet, Branko Milanovic's data on the World Income Distribution (WYD), the UNU-WIDER World Income Inequality Database (WIID) and primary sources (preferred in the order mentioned) on the relative distribution and mean income for each country in a given year, the GCIP project calculates disposable income in each decile of the distribution. For years with missing data, the income profile is interpolated or extrapolated using per capita growth rates from the World Development Indicators.[2]

We specifically use information in the CGIP database on the income shares of each decile of the income distribution, which we aggregate to quintiles. We combine the quintile shares with data on purchasing-power adjusted GDP per capita from the Penn World Tables (Feenstra et al. 2015) in order to arrive at average incomes in each quintile. We use these data to calculate cumulative growth within each five-year period from 1975 to 2015, and the logarithm to initial quintile income in each period. The five quintile growth rates are our dependent variables in the following.

The main independent variables derive from the Fraser Institute's annual report on *Economic Freedom of the World* (Gwartney et al. 2017). Economic freedom is there defined as a state in which individuals "are permitted to choose for themselves and engage in voluntary transactions as long as they do not harm the person or property of others." (p. 1). They measure the degree to which policies and institutions are consistent with the concept of economic freedom as an aggregate index of five elements: 1) the size of government, 2) the quality of the legal system and property rights, 3) sound money, 4) the freedom to trade internationally, and 5) a regulation component. All of these indices are themselves composed of a number of sub-indices, such that the full dataset allows any researcher to aggregate or disaggregate according to the relevant situation.

[2] For more details on the GCIP-data, see Lahoti et al. (2016). Although interpolated data may be problematic, we argue that it is not a major problem in our application. The main problems with using interpolated data occur in annual panel or time series data while we employ five-year periods. Changes are therefore already smoothed out across five-year periods and interpolating one or two years in between surveys is therefore unlikely to cause any practical problems.

Specifically, area 1 measures government size using indicators such as public consumption and transfers relative to GDP, top marginal tax rates and state-owned enterprises. Area 2 quantifies the quality and integrity of the legal system and the protection of property rights, and can be thought of as an attempt to quantify rule of law. This index is known to correlate substantially with alternative measures of the rule of law. Area 3, which is called 'sound money', captures the effect of high and unpredictable changes in inflation and money supply. Area 4 combines measures of trade taxes, tariff rates, non-tariff trade barriers and capital market controls to create a composite measure of freedom to trade. Finally, area 5 consists of three indices on the regulation of credit, labor, and business, which quantifies regulation of credit markets, labor markets and business in general. This area consists of measures of bank ownership, interest rate controls, hiring and firing regulations, and administrative and bureaucracy costs associated with starting and running businesses.

In addition, the most recent editions also include a correction for gender differences in the access to proper legal protection, which we apply in the following (Fike 2017). As described above, results based on the aggregate index are hard to interpret, as they may consist of different and potentially opposite effects of separate elements of the overall index of economic freedom. We therefore disaggregate the full index of economic freedom into conceptually coherent indices of government size, institutional quality and policy quality. Our interpretation of the indices is that area 2 is basically an indicator of institutional quality and is also the area that has been shown consistently to be most robustly associated with growth (Berggren and Jordahl 2005; Rode and Coll 2012; Hall and Lawson 2014).[3] This pattern is further confirmed by the literature on institutions as fundamental causes of growth (Acemoglu et al. 2005; Rodrik et al. 2004). Finally, areas 3, 4 and 5 are the policy areas that capture the economic freedom of monetary policy, trade policy and regulatory freedom respectively. We follow arguments in the literature that policies within these three areas can be substitutes with approximately equal consequences in aggregating them into one index (Gwartney et al. 2017). They are nevertheless a priori easier to change than basic property rights institutions and thus should be treated separately.

[3] Typically, area 2 of the EFW index is heavily correlated with alternatives such as the rule of law component of the Worldwide Governance Indicators (Kaufmann et al. 1999) – or indeed other components of these indicators, or that of the Heritage Foundation Index of Economic Freedom (2017). Within our sample, the correlations between and institutional quality and these measures are .8 or higher.

Because institutional quality and policy quality are highly correlated with each other (r=.60), we also do not include them simultaneously to avoid multicollinearity problems. Instead, we think of the results using policy quality as a form of robustness test of the main results using institutional quality, as slight changes in measurement ought not to change the main findings. On the other hand, the government size area is almost uncorrelated with institutional quality and policy quality (r = –.13 and r = –.19) and is therefore always included in the specification.

We keep the rest of the specification relatively simple in order not to include so-called bad controls or effectively control for relevant transmission mechanisms of economic freedom.[4] Our specification therefore follows the parsimonious standard in the growth literature by including only the logarithm of initial quintile income, trade volumes (export plus imports as a share of total GDP), investment rates as a share of total GDP, and a dummy for democracy. Trade volumes and investment shares also derive from Feenstra et al. (2015) while the democracy measure is the dichotomous minimalist measure developed by Cheibub et al. (2010) as updated by Bjørnskov and Rode (in press). In a set of separate tests, we replace the democracy measure with the PolCon III indicator of political constraints from Henisz (2000). That indicator captures the strength of effective institutional veto players and thus works as a proxy measure for the likely stability of changes in economic freedom.

The inclusion of democracy allows us to also include an interaction between democracy and the economic freedom variables, and thus account for the theoretical expectation that policies and institutions may have different consequences in democratic societies. By doing so we contribute to the debate regarding democracy and capitalism cited in the introduction.[5] We also provide tests in which we interact the political constraints measure with the economic variables. In both cases, we provide conditional marginal point estimates with conditional standard errors as calculated by the delta method (Brambor et al. 2006).

[4] While trade policy is part of area 4 of the EFW and thus part of our policy quality index, we include actual trade flows in the baseline specification. In additional test (not shown), we find no differences from the results reported in the following when we exclude trade flows.

[5] In addition, we include an interaction between democracy and the initial income. This interaction is necessary, as convergence may differ between democracies and autocracies when democratic economic performance is more similar (cf. Giavazzi and Tabellini, 2005). In addition, the interaction between institutional quality and democracy may arguably proxy for an interaction between income and democracy, which we effectively control for by including the latter.

We run regressions as in (1), where $\Delta Y_{i,j,t}$ denotes growth in income in quintile *i* in country *j* at time *t*, $X_{j,t}$ is a vector of country-specific variables, $EF_{j,t}$ is economic freedom in country *j* at time *t*, $DE_{j,t}$ is initial democracy, and $EF_{j,t}\,DE_{j,t}$ denotes the interaction between economic freedom and initial democracy. All regressions also include a full set of period and country fixed effects, which means that the findings are identified by the within-country variation over time.

$$\Delta Y_{i,j,t} = \alpha + \delta\, Y_{i,j,t-1} + \beta\, X_{j,t} + \mu\, EF_{j,t} + \eta\, DE_{j,t} + \chi\, EF_{j,t}\, DE_{j,t} + \varepsilon_{i,j,t} \qquad (1)$$

The full dataset, which consists of up to 977 observations with full data in nine five-year periods between 1975 and 2015 from 145 countries, is summarized in Table 1.

Table 1. Descriptive statistics

Variable	Mean	Standard deviation	Observations
Growth, first quintile	.079	.292	1219
Log initial income, first	7.081	1.583	1220
Growth, second quintile	.086	.227	1219
Log initial income, second	7.783	1.453	1220
Growth, third quintile	.088	.205	1219
Log initial income, third	8.234	.1365	1220
Growth, fourth quintile	.089	.192	1219
Log initial income, fourth	8.680	1.276	1220
Growth, fifth quintile	.092	.185	1219
Log initial income, fifth	9.674	6.226	1220
Trade volume	.498	.469	1424
Investment rate	.211	.101	1424
Democracy	.443	4.97	1590
Government size index	5.883	1.589	1223
Institutional quality	5.198	1.915	1111
Policy quality	6.493	1.642	1266
Political constraints	.219	.216	1351

As a final observation, we do not directly deal with potential endogeneity problems, since the established consensus from previous research suggests that the association between reforms that increase economic freedom and the growth of average income reflects a causal relationship (Dawson 2003; Faria and Montesinos 2009; Heckelman 2000; Justesen 2008; Bjuggren 2018; Schivardi and Viviano 2011). We can therefore be fairly certain that the *average* association between economic freedom and growth is causal, and the additional effect identified by differences among the five quintiles allows causal inference (cf. Nizalova and Murtazashvili, 2016).

4. Analysis

Table 2 provides our main estimates of the effects for government size and institutional quality across the five quintiles. The results indicate positive effects of trade and investments, in line with the literature, but these estimates vary across the quintiles. We find relatively larger estimates of trade for the low quintiles and larger estimates of investments for higher quintiles, although the differences are not significantly different across quintiles. Hence, we cannot say with any certainty that trade or investments in general cause unbalanced growth. Similarly, we find no effects of democracy whereas initial quintile income – that is, the convergence term – is significantly larger for the first quintile relative to the rest.[6] As such, countries with lower average income as well as countries with comparatively smaller income shares in the first quintile tend to become more equal over time. These results are thus consistent with the majority of our sample being on the downward sloping part of the Kuznets Curve (Kuznets 1955; Chong 2004).

Turning to the main variables of interest, our estimates in Tables 2 and 3 suggest that both institutional quality and policy quality are significantly and positively associated with growth.

We plot these estimates in Figures 2 (government size) and 3 (institutional quality) and note that the estimates from Table 3 for policy quality match those for institutional quality quite closely.

[6] The point estimates of democracy in the tables have to be interpreted as democracy at values of government size, institutional quality and policy quality of zero, which we never observe in the sample. However, it is worth noting that there are no values at which the marginal point estimate of democracy even approaches significance at any conventional levels. It appears that democracy is always insignificant with a point estimate close to zero.

Figure 2. Government size and quintile growth

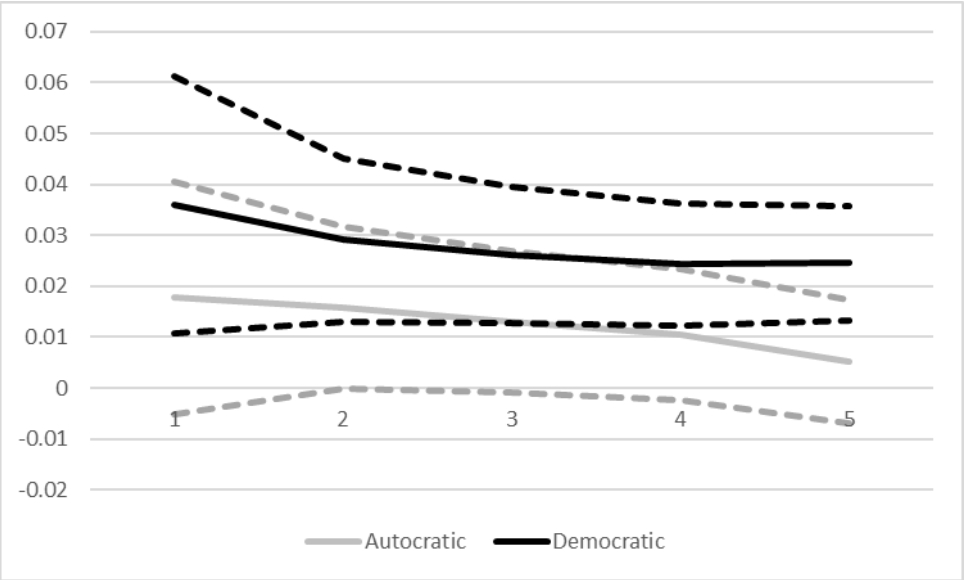
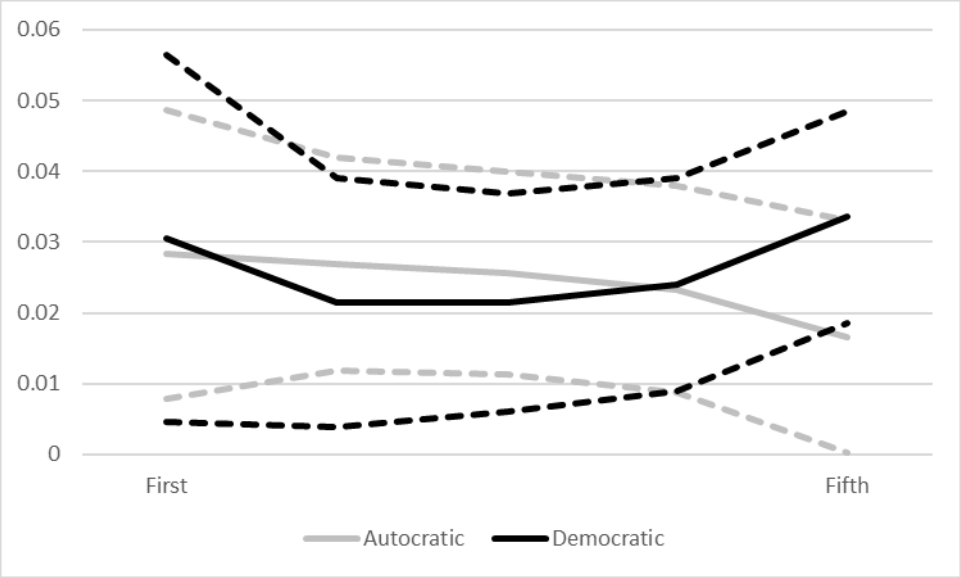


Figure 3. Institutional quality and quintile growth



The point estimates suggest that the effect of institutional quality is largest for the lowest quintile and smallest for the highest, but these differences are again not statistically significant, as the confidence intervals clearly overlap the point estimates. Conversely, we find that although the point estimates of the government index also do not differ significantly, these estimates are subject to substantially more noise in autocracies. As we report in the lower panel of the tables, the index of government size is significantly associated with growth

across all quintiles in democratic countries and always positively so. We find a similar pattern for both institutional quality and policy quality where the estimates are always significant. Although institutional quality appears marginally more important in autocracies and policy quality more so in democracies, none of these differences are near significance; neither are any differences across the five quintiles.

Table 2. Main results, government size and institutional quality

Quintile	First	Second	Third	Fourth	Fifth
Lagged quintile av. income	-.414*** (.036)	-.314*** (.033)	-.276*** (.029)	-.262*** (.026)	-.274*** (.024)
Trade volume	.079* (.042)	.065** (.029)	.059** (.025)	.058** (.024)	.059** (.025)
Investment rate	.439*** (.169)	.459*** (.129)	.466*** (.115)	.482*** (.106)	.538*** (.099)
Democracy	-.011 (.165)	-.092 (.118)	-.124 (.112)	-.142 (.115)	-.106 (.157)
Government size index	.018 (.012)	.016* (.008)	.013* (.007)	.010 (.007)	.005 (.006)
Institutional quality	.028*** (.010)	.027*** (.008)	.026*** (.007)	.023*** (.007)	.017** (.008)
Democracy * lagged income	-.015 (.019)	.007 (.015)	.009 (.014)	.008 (.015)	-.008 (.018)
Democracy * government	.018 (.015)	.013 (.010)	.013 (.009)	.014* (.008)	.019** (.008)
Democracy * quality	.002 (.015)	-.006 (.009)	-.004 (.009)	.001 (.009)	.017* (.009)
Country Fe	Yes	Yes	Yes	Yes	Yes
Period FE	Yes	Yes	Yes	Yes	Yes
Observations	977	977	977	977	977
Countries	145	145	145	145	145
Within R squared	.346	.333	.333	.336	.342
F statistic	18.48	16.19	15.18	14.83	17.54
Marginal effect in democracies					
Lagged quintile av. income	-.429*** (.039)	-.306*** (.033)	-.266*** (.028)	-.254*** (.025)	-.282*** (.023)
Government size index	.036*** (.013)	.029*** (.008)	.026*** (.007)	.024*** (.006)	.025*** (.006)
Institutional quality	.030** (.013)	.021** (.009)	.021** (.008)	.024*** (.009)	.034*** (.008)

Note: Standard errors clustered at the country level in parantheses *** (**) [*] denote significance at p<.01 (p<.05) [p<.10]. All regressions include a constant term.

Table 3. Main results, government size and policy quality

Quintile	First	Second	Third	Fourth	Fifth
Lagged quintile av. income	-.366*** (.033)	-.279*** (.029)	-.248*** (.026)	-.234*** (.024)	-.235*** (.023)
Trade volume	.059 (.038)	.051** (.025)	.048** (.022)	.049** (.020)	.051** (.020)
Investment rate	.315** (.159)	.369*** (.113)	.391*** (.098)	.416*** (.089)	.472*** (.087)
Democracy	-.047 (.151)	-.064 (.115)	-.065 (.113)	-.063 (.117)	-.023 (.146)
Government size index	.008 (.011)	.007 (.008)	.006 (.007)	.004 (.007)	.000 (.007)
Policy quality	.028** (.012)	.035*** (.009)	.037*** (.009)	.036*** (.009)	.037*** (.008)
Democracy * lagged income	-.024 (.019)	-.008 (.015)	-.007 (.014)	-.008 (.014)	-.013 (.016)
Democracy * government	.019 (.016)	.012 (.011)	.009 (.009)	.007 (.009)	.011 (.008)
Democracy * quality	.016 (.015)	.010 (.012)	.012 (.012)	.014 (.012)	.012 (.010)
Country Fe	Yes	Yes	Yes	Yes	Yes
Period FE	Yes	Yes	Yes	Yes	Yes
Observations	1052	1052	1052	1052	1052
Countries	145	145	145	145	145
Within R squared	.333	.347	.360	.364	.345
F statistic	19.38	21.39	20.56	20.18	19.00
Marginal effect in democracies					
Lagged quintile av. income	-.390*** (.039)	-.287*** (.027)	-.254*** (.024)	-.242*** (.022)	-.248*** (.021)
Government size index	.027** (.013)	.019** (.008)	.015** (.007)	.012* (.0076	.012** (.006)
Policy quality	.044*** (.013)	.045*** (.009)	.048*** (.009)	.051*** (.009)	.049*** (.008)

Note: Standard errors clustered at the country level in parentheses *** (**) [*] denote significance at p<.01 (p<.05) [p<.10]. All regressions include a constant term.

To illustrate the size of our estimated associations, we note first that (as shown in Table 1), incomes grow on average between 8 and 9 percent over a five-year period in our sample. Based on the estimates in democracies, a one standard-deviation increase in institutional quality is associated with roughly 6 percentage units higher income growth in quintile one and five, and roughly 4 percentage units higher growth in quintiles two, three and four. While these differences are in line with the idea that economic freedom reforms benefit the top and the bottom of the income distribution, the differences between quintiles are far from statistically significant. In summary we thus find no evidence that the positive effects of economic freedom differ across the income distribution, at least when separating the medium-run growth effects in the five quintiles of the initial distribution. For estimates of changes in government size in autocracies estimates are too noisy to yield a significant pattern.

In Table 4, we explore one of several reasons for these differences between democracies and autocracies. Previous studies argue that the potential effects of policy and institutional changes mainly materialize in countries in which strong veto institutions make reforms credibly stable (Henisz 2000; Justesen and Kurrild-Klitgaard 2013; Justesen 2014). We therefore replace democracy and its interactions with a direct measure for the strength of effective veto players in the policy process. We report the results in Table 4 where the lower panel contains conditional point estimates of government size and institutional quality evaluated at the median and 90th percentile of veto player strength. The results in the upper panel can therefore be interpreted as marginal effects at the 25th percentile, which is essentially *no* veto players and thus a subset of the most autocratic autocracies.

The results first indicate that while government size affects the growth rate in all quintiles and the effects do not differ significantly in democracies, the effect is insignificant in the fifth quintile in autocracies and the much larger estimate for the first quintile is significantly different from that in the fifth quintile. Put differently, we find that increases in government size (i.e. reductions in the economic freedom index area 1) are significantly associated with lower growth for the first to fourth quintiles, but not for the richest quintile when there are no effective veto institutions.

Table 4. Veto results, government size and institutional quality

Quintile	First	Second	Third	Fourth	Fifth
Lagged quintile av. income	-.417*** (.039)	-.313*** (.035)	-.276*** (.031)	-.263*** (.027)	-.271*** (.024)
Trade volume	.076* (.042)	.060** (.027)	.054** (.024)	.053** (.022)	.058** (.024)
Investment rate	.452*** (.160)	.459*** (.123)	.464*** (.109)	.479*** (.102)	.526*** (.097)
Political constraints	-.147 (.350)	-.292 (.279)	-.384 (.252)	-.449* (.248)	-.206 (.298)
Government size index	.022* (.012)	.018** (.008)	.014** (.007)	.011* (.006)	.005 (.006)
Institutional quality	.019 (.012)	.020** (.009)	.019** (.008)	.019** (.008)	.012 (.009)
Constraints * lagged income	-.018 (.046)	.021 (.036)	.029 (.032)	.029 (.030)	-.027 (.035)
Constraints * government	.022 (.031)	.022 (.020)	.024 (.018)	.027 (.017)	.043*** (.015)
Constraints * quality	.045 (.035)	.016 (.024)	.015 (.021)	.022 (.020)	.055*** (.021)
Country Fe	Yes	Yes	Yes	Yes	Yes
Period FE	Yes	Yes	Yes	Yes	Yes
Observations	977	977	977	977	977
Countries	145	145	145	145	145
Within R squared	.347	.336	.339	.343	.348
F statistic	16.77	15.29	15.12	15.19	17.83
Marginal effect at median veto strength					
Lagged quintile av. income	-.423*** (.037)	-.307*** (.032)	-.267*** (.028)	-.254*** (.025)	-.279*** (.023)
Government size index	.029*** (.009)	.025*** (.007)	.022*** (.006)	.020*** (.005)	.019*** (.005)
Institutional quality	.034*** (.009)	.025*** (.007)	.025*** (.006)	.026*** (.006)	.031*** (.006)
Marginal effect at 90th perccentile veto strength					
Lagged quintile av. income	-.427*** (.039)	-.302*** (.033	-.261*** (.028)	-.248*** (.025)	-.285*** (.025)
Government size index	.034*** (.013)	.029*** (.009)	.027*** (.007)	.026*** (.007)	.028*** (.006)
Institutional quality	.043*** (.014)	.029*** (.009)	.028*** (.008)	.030*** (.008)	.042*** (.008)

Note: Standard errors clustered at the country level in parantheses *** (**) [*] denote significance at p<.01 (p<.05) [p<.10]. All regressions include a constant term.

We find a similar difference for institutional quality in countries without veto institutions, where the association fails significance in both the first and fifth quintiles. Conversely, we cannot exclude that the effects of government size and institutional quality are identical in countries with at least a minimum of veto players with de facto influence. As such, we find that economic freedom only has non-inclusive growth consequences in countries without any effective veto institutions. Importantly, these countries are always autocratic, yet within the present sample, a third of all autocratic societies have governments that are subject to veto institutions with some power. The rather weak indications of heterogeneous effects in Tables 2 and 3 between democracies and autocracies and the somewhat stronger heterogeneity in Table 4 across degrees of veto player strength thus indicate that the restricting features are not democracy or veto institutions per se, but are likely associated with particular types of autocracies.

We perform a set of further analyses, some of which are reported in full in the appendix, which indicates that the main findings are robust to a number of additional tests. These tests consist of excluding post-communist countries, and replacing the conditioning effect of democracy with conditions that observations are either above the sample median average income or above the sample median level of institutional quality.

We for example find that they are not driven by the inclusion of post-communist countries in which both economic freedom and the shape of the income distribution has changed dramatically since the collapse of communism; these results are reported in appendix Table A1. Tests in which we exclude the 10 % poorest or 10 % richest observations in our sample also yield qualitatively identical (and quantitatively very similar) estimates of particularly government size and institutional quality. Neither does the exclusion of observations with substantially negative economic growth – i.e. around the financial crisis after 2008 or the Latin American debt crisis in the early 1980s – change the main findings. A further observation before proceeding to a discussion of the overall findings therefore is that they are very robust to most standard tests.

A final question is to which extent we can establish that there are – or there are no – effect differences due to democracy, or if alternative factors are more likely. In the appendix, we explore two such factors, which we use to form a dummy similar to the democracy measure: Real GDP per capita, and good institutional quality. In both cases, we form dummies that take the value 1 if the observation is above the sample median and 0 otherwise.

As expected, the overlap between the subsamples characterized by having democracy, high incomes and high institutional quality is substantial, but far from perfect. Our sample for

example includes 181 observations in which countries are democratic, but have below-median institutional quality, 101 observations from autocratic countries with above-median institutional quality, as well as 151 observations from relatively poor democracies and 136 observations from relatively rich autocracies. Finally, the sample includes 158 observations from countries with above-median real income that nonetheless have institutional quality below the median, and 84 observations from countries that in a five-year period were characterized by having relatively low incomes but above-median institutions. As such, the variation across these ways of dividing the sample ought to be sufficient to identify differences between the splits.

We nevertheless find very similar results when we replace the interaction with democracy with an interaction with whether or not a country was below or above the sample median real income in a given five-year period; results are reported on appendix Table A2. Again, we observe that the main difference is in the precision of the estimate, and not in the size of the effect, as government size is only significant in countries above the median income. Conversely, when interacting government size, policy quality and institutional quality with a dummy indicating whether institutional quality is above the sample median (appendix Table A3), we observe that effects of changes in government size are always larger in societies with relatively good institutional quality, and that the difference is most precisely measured for the fifth quintile. We also see indications that convergence is substantially faster in countries with relatively high institutional quality, implying that the long-run effects of policy and institutional changes in these countries are substantially larger. As such, these findings, although much more general, are similar to Freund and Bolaky's (2008) result that trade policy has larger income effects in countries with good institutions.

In a final test (not shown), we perform a 'beauty contest' between the interactions by simultaneously including each combination of two of the three interactions in the same regression. While this inevitably creates multicollinearity problems, we take the results as first indications of the strength of each separate conditional effect. The results of the beauty contest suggest that the precisely estimated effects of government size on the first quintile are strongest when we condition on democracy while the estimated effects of policy quality and institutional quality are strongest when condition on whether or not institutional quality is above the median. As such, although this type of test can never be definitive, we find some evidence that political institutions are more likely to mediate the effects of government size while judicial institutions are more likely to mediate the effects of policy and institutional differences. With this final indication, we proceed to discuss the findings.

5. Conclusions

Numerous studies by now document the effects of economic freedom on growth and long-run development (Hall and Lawson 2014). However, the literature on the relation between economic freedom and income inequality is mixed and claims of its pernicious consequences regularly appear in political debate. In this paper, we have therefore explored whether economic freedom really 'raises all boats', or if policy and institutional changes towards more economic freedom lead to unbalanced growth across the initial income distribution. To do so, we combine standard data on economic freedom from the Fraser Institute with new and extensive data on income distribution from the Global Consumption and Income Project. We use the resulting panel dataset of 145 countries observed in up to nine five-year periods to test the effects of economic freedom on income growth within the five quintiles of the distribution.

Overall, our results suggest that institutional quality and policy quality are positively associated with income growth across the income distribution. These effects appear in both democracies and autocracies while limited government is significantly associated with income growth across all quintiles only in democracies. In societies with no effective veto institutions, which is a subset of autocratic societies within our sample, we find that limited government is associated with higher income growth for the lowest quintile, with no significant effect for the top quintile.

In all other cases, we find no significant differences in the effects of economic freedom on quintile income growth. Yet, although the differences in how economic freedom is associated with income growth at different points in the income distribution are not significant, they may still help to explain why studies using inequality as the dependent variable are so mixed. First, the strongly significant differences in the convergence term between the first quintile and the rest of the distribution – and thus the substantially larger long-run multiplier of changes for income in the first quintile – suggest that there are large differences between short-run and long-run distributional effects, and the long-run equilibrium consequences of economic freedom may actually imply a more equal distribution of income. Second, when focusing on the medium-run dynamics, our findings suggest that the sample composition may strongly affect the overall results. In particular, findings in samples dominated by poor, autocratic countries with limited veto institutions are likely to be quite different from findings in samples dominated by modern democracies. Because most existing studies with conflicting findings arguably capture medium-run effects and differ in sample

composition, our result suggests that the conflicting findings in previous studies are less puzzling than they might seem.

Finally, our findings highlight the importance of taking seriously that features of political institutions may moderate the distributional consequences of effects of economic freedom. In any case, our findings clearly suggest that the consequences of reforms that increase economic freedom will boost medium-run growth for all five income quintiles. In other words, economic freedom does seem to lift all boats.

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Appendix: Robustness tests

Table A1. Results, no post-communist countries

Quintile	First	Second	Third	Fourth	Fifth
Lagged quintile av. income	-.344***	-.258***	-.230***	-.222***	-.222***
	(.033)	(.028)	(.025)	(.022)	(.019)
Trade volume	.056	.043*	.041*	.044**	.050**
	(.041)	(.026)	(.022)	(.021)	(.023)
Investment rate	.379**	.389***	.395***	.412***	.452***
	(.157)	(.107)	(.093)	(.086)	(.086)
Democracy	-.113	-.124	-.124	-.123	-.092
	(.155)	(.122)	(.119)	(.121)	(.138)
Government size index	.009	.008	.006	.004	-.001
	(.011)	(.008)	(.008)	(.007)	(.007)
Policy quality	.023**	.030***	.032***	.032***	.035***
	(.011)	(.009)	(.009)	(.009)	(.009)
Democracy * lagged income	-.004	-.008	-.007	-.004	-.004
	(.021)	(.016)	(.016)	(.015)	(.016)
Democracy * government	.016	.011	.009	.008	.013
	(.017)	(.011)	(.009)	(.009)	(.008)
Democracy * quality	.011	.003	.004	.008	.008
	(.014)	(.011)	(.011)	(.012)	(.011)
Country Fe	Yes	Yes	Yes	Yes	Yes
Period FE	Yes	Yes	Yes	Yes	Yes
Observations	924	924	924	924	924
Countries	117	117	117	117	117
Within R squared	.295	.311	.326	.331	.329
F statistic	17.17	19.54	19.34	19.86	23.15
With institutional quality					
Democracy	-.044	-.099	-.122	-.139	-.129
	(.173)	(.127)	(.119)	(.118)	(.149)
Government size index	.016	.014	.011	.008	.002
	(.012)	(.009)	(.008)	(.007)	(.006)
Institutional quality	.026**	.027***	.026***	.024***	.018**
	(.009)	(.007)	(.007)	(.007)	(.009)
Democracy * lagged income	-.006	.011	.011	.009	-.004
	(.022)	(.017)	(.015)	(.015)	(.017)
Democracy * government	.014	.011	.012	.014	.019***
	(.017)	(.011)	(.009)	(.008)	(.007)
Democracy * quality	.002	-.008	-.007	-.002	.012
	(.015)	(.009)	(.009)	(.009)	(.009)

Note: Standard errors clustered at the country level in parentheses *** (**) [*] denote significance at p<.01 (p<.05) [p<.10]. All regressions include a constant term.

Table A.2. Interacted results, median real income

Quintile	First	Second	Third	Fourth	Fifth
Lagged quintile	-.406***	-.291***	-.236***	-.205***	-.182***
av. income	(.044)	(.033)	(.031)	(.029)	(.025)
Trade volume	.072*	.069**	.073***	.081***	.098***
	(.043)	(.031)	(.028)	(.026)	(.024)
Investment rate	.325**	.344***	.339***	.341***	.368***
	(.159)	(.114)	(.101)	(.095)	(.085)
Democracy	.008	.012	.008	.003	-.003
	(.026)	(.018)	(.016)	(.016)	(.015)
Above median	-.077	.181	.492	.803**	1.525***
income	(.349)	(.343)	(.365)	(.387)	(.416)
Government	.019*	.016**	.012*	.009	-.000
size index	(.011)	(.007)	(.007)	(.006)	(.006)
Policy quality	.031***	.035***	.037***	.038***	.041***
	(.011)	(.008)	(.007)	(.007)	(.007)
Above median *	.023	-.016	-.055	-.089*	-.159***
lagged income	(.052)	(.046)	(.046)	(.0469	(.044)
Above median *	-.008	-.009	-.009	-.007	.009
government	(.015)	(.011)	(.009)	(.009)	(.009)
Above median *	.010	.012	.012	.011	.004
quality	(.016)	(.012)	(.011)	(.010)	(.009)
Country Fe	Yes	Yes	Yes	Yes	Yes
Period FE	Yes	Yes	Yes	Yes	Yes
Observations	1052	1052	1052	1052	1052
Countries	145	145	145	145	145
Within R squared	.335	.351	.365	.370	.363
F statistic	19.27	20.23	20.18	20.46	19.90
With institutional quality					
Above median	-.301	.007	.338	.623	1.364***
income	(.443)	(.407)	(.390)	(.389)	(.411)
Government	.028**	.021**	.016**	.012*	.003
size index	(.012)	(.008)	(.007)	(.006)	(.006)
Policy quality	.019	.020**	.021***	.022***	.021**
	(.014)	(.008)	(.007)	(.007)	(.008)
Above median *	.039	-.002	-.043	-.075	-.155***
lagged income	(.064)	(.055)	(.049)	(.046)	(.044)
Above median *	.000	.003	.006	.009	.024***
government	(.015)	(.010)	(.009)	(.008)	(.007)
Above median *	.021	.009	.005	.004	.008
quality	(.017)	(.012)	(.009)	(.009)	(.009)

Note: Standard errors clustered at the country level in parentheses *** (**) [*] denote significance at p<.01 (p<.05) [p<.10]. All regressions include a constant term.

Table A.3. Interacted results, institutional quality

Quintile	First	Second	Third	Fourth	Fifth
Lagged quintile	-.401***	-.290***	-.249***	-.235***	-.256***
av. income	(.036)	(.031)	(.027)	(.024)	(.023)
Trade volume	.075*	.061**	.055**	.053**	.057**
	(.046)	(.029)	(.025)	(.023)	(.022)
Investment rate	.359***	.370***	.375***	.392***	.451***
	(.164)	(.122)	(.106)	(.098)	(.096)
Democracy	.003	.008	.004	-.000	-.003
	(.027)	(.018)	(.016)	(.016)	(.015)
Above median	.177	.158	.165	.171	.208
inst. quality	(.156)	(.109)	(.108)	(.122)	(.174)
Government	.013	.011	.009	.007	.002
size index	(.011)	(.007)	(.007)	(.006)	(.006)
Policy quality	.029***	.036***	.039***	.038***	.035***
	(.011)	(.008)	(.008)	(.007)	(.007)
Above median *	-.036*	-.026**	-.026**	-.027*	-.034*
lagged income	(.018)	(.013)	(.013)	(.014)	(.018)
Above median *	.019	.009	.007	.006	.014*
government	(.015)	(.010)	(.009)	(.008)	(.008)
Above median *	.004	.004	.006	.009	.012
quality	(.016)	(.013)	(.011)	(.011)	(.009)
Country Fe	Yes	Yes	Yes	Yes	Yes
Period FE	Yes	Yes	Yes	Yes	Yes
Observations	977	977	977	977	977
Countries	117	117	117	117	117
Within R squared	.355	.356	.368	.376	.373
F statistic	16.33	17.73	19.21	20.09	17.37
With institutional quality					
Above median	.009	.080	.106	.106	.101
inst. quality	(.169)	(.122)	(.112)	(.119)	(.175)
Government	.018*	.016**	.014**	.011**	.007
size index	(.011)	(.007)	(.006)	(.006)	(.005)
Institutional	.019	.025**	.029***	.031***	.027***
quality	(.014)	(.010)	(.009)	(.009)	(.009)
Above median *	-.044**	-.027**	-.022*	-.021	-.029*
lagged income	(.019)	(.013)	(.012)	(.013)	(.017)
Above median *	.027**	.018**	.016**	.016**	.025***
government	(.013)	(.009)	(.008)	(.007)	(.008)
Above median *	.031	.005	-.005	-.007	.006
quality	(.022)	(.015)	(.012)	(.011)	(.012)

Note: Standard errors clustered at the country level in parentheses *** (**) [*] denote significance at p<.01 (p<.05) [p<.10]. All regressions include a constant term.

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