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# Corruption, judicial accountability and inequality: Unfair procedures may benefit the worst-off

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ABSTRACT

We ask whether, as many seem to think, corruption worsens, and judicial accountability improves, inequality, and investigate this empirically using data from 145 countries 1960–2014. We relate perceived corruption and *de facto* judicial accountability to gross-income inequality and consumption inequality. The study shows that corruption is *negatively*, and that judicial accountability is *positively*, related to both types of inequality. The estimates are particularly pronounced in democracies and arguably causal in the case of consumption inequality, which we show using a novel identification method indicating that the full effect only occurs after institutional stability has been established. The findings suggest that "unfair procedures" – corruption and deviations from judicial accountability – may benefit the economically worst off and worsen the situation of the economic elite.



## 1. Introduction

Corruption is largely regarded as a pernicious activity that involves breaching procedural justice, that distorts political decisions and that generates various undesirable outcomes, such as lower economic growth.[1] One common concern is that corruption favors the rich and powerful. Conversely, judicial accountability (a prime aspect of institutional quality) is often seen not only as an antidote to corruption but also as something valuable *per se*, although the focus is rarely on the distributional consequences.[2] When corruption is present, and judicial accountability is compromised, "unfair procedures" in public governance tend to become endemic. In this study, we aim to analyze how these unfair procedures, whereby people gain

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[1] On the generally negative relation between corruption and economic growth, see, e.g., Aidt (2009) and Pellegrini (2011). However, Méon and Weill (2010) find that in settings with very poor institutions, corruption can be efficiency-enhancing.

[2] For examples of a small literature relating, among other things, the quality of the legal system to inequality, see Berggren (1999) and Bergh and Nilsson (2010). For one of many studies showing a positive relationship between judicial accountability and GDP per capita, see Voigt (2008).

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influence over policy, legislation and their implementation in violation of the general system of rules, affect income and consumption inequality. Which income and consumption quintiles benefit and which are made relatively worse by corruption and by the absence of judicial accountability?[3]

We follow Aidt (2003, p. F632) by regarding corruption as "an act in which the power of public office is used for personal gain in a manner that contravenes the rules of the game (Jain, 2001)"; and judicial accountability obtains when "judges [who] are found responsible for serious misconduct […] are […] removed from their posts or otherwise disciplined" (Coppedge et al., 2017a, p. 211). We thus study political corruption, or what Gutmann and Lucas (2018) call public-sector corruption, i.e., corruption involving politicians, bureaucrats and jurists, as well as the degree to which the legal system sanctions legal officials who are corrupt or who allow corruption in the public sector.[4]

On theoretical grounds, there are reasons to expect both corruption and judicial accountability to affect income and consumption inequality, but it is ambiguous whether the effects are positive or negative. Changes in economic policy and institutions brought about by corrupt practices can benefit different parts of the income distribution differently. While many probably expect those with higher income and consumption to benefit more, it remains possible that those people realize that they cannot push through policies that primarily benefit them, due to the risk of social turmoil; or they can have an altruistic streak, so as to act to benefit others out of concern for their welfare; or it could be that people other than the richest are more successful, at times, in getting favors (e.g., on the local level, with much personal interaction between people in general and public officials). In these latter cases, more corruption could entail less inequality. It remains an empirical question if this is the case.

Previous studies are limited by focusing on small groups of countries, by employing somewhat dated data and by a lack of causal identification; furthermore, the results are conflicting between the studies. While Dobson and Ramlogan-Dobson (2010) and Andres and Ramlogan-Dobson (2011) find lower corruption to be associated with more income inequality in Latin America, others – such as Gupta et al. (2002), studying 38 countries over 1980–1997, and Gyimah-Brempong (2002), looking at Africa only – find the opposite relationship.[5]

What we add to the existing literature is a much more comprehensive dataset – we look at 145 countries over the period 1960–2014 and thus capture a much more diverse group of countries and a much longer time period than any previous study; and, importantly, we control for political institutions and interact their stability with corruption, which allows us to make more credible causal claims. This identification strategy builds on Mancur Olson's idea of institutional sclerosis, implying that such stability can give greater options for corrupt people to engage in corruption. Hence, one would expect the relationship between corruption and inequality to become stronger, in whatever direction, with more political stability. Any additional effect of corruption that arises once institutions stabilize after major changes and Olsonian sclerosis sets in can arguably be interpreted as causal.

The results indicate that corruption is *negatively* related to both gross-income and consumption inequality (based on income/consumption shares per quintile of the population and as Gini and Theil coefficients), while judicial accountability is *positively* related to such distributional outcomes. More specifically, the more corruption there is, the higher is the income and consumption shares of the bottom quintile of the income/consumption distribution, and the more accountable the *de facto* procedures of the judicial institutions are, the higher are the income and consumption shares of the top quintile. These results are confirmed, in the case of consumption inequality, when using Gini and Theil coefficients instead of quintile shares. However, using the identification strategy described briefly above (and more fully below), we can only make causal claims with reasonable confidence when the outcome variable is consumption inequality for which we observe increasing effects over time, as implied by Olson's sclerosis hypothesis.

Our findings suggest that in spite of what popular perceptions might be, corruption does not necessarily benefit the economic elites, and investing in judicial accountability may in fact skew the income distribution. Rather, the findings are compatible with the replacement-theory prediction that elites will allow others to benefit when they fear that their power will otherwise risk being eroded (which is plausibly the case in highly corrupt societies). They are also compatible with the elites having an altruistic streak; with non-elites being more successful at using corruption to their advantage than elites; and with the notion that market outcomes may simply turn out to benefit the non-elites, irrespective of what the corrupt instigators had aimed at accomplishing.

We believe this study matters in at least two ways. First, it brings new knowledge to bear on the important issue of what the consequences of corruption and judicial accountability are. If one dislikes inequality, our study suggests that corruption may not only have negative effects, and that judicial accountability may entail negative effects, which suggests that combatting corruption and strengthening judicial accountability may have unintended consequences. Second, it furthermore sheds new light on what determines income and consumption inequality, not only showing that corruption and judicial quality are important explanatory factors but also that political institutions – and not least their stability – matter. This should provide useful insights for those working in policy areas where corruption is present.

[3] Meyer and Sullivan (2017) argue that consumption inequality is a useful complement to income inequality because consumption often provides a more accurate picture of economic well-being than income.

[4] For a conceptualization of judicial accountability as more or less the inverse of corruption, see Gutmann and Voigt in press. Also see Voigt and Gutmann (2015) on judicial corruption.

[5] Relatedly, Bjørnskov and Justesen (2014) uncover, for an African sample, that the poor are obliged to pay bribes to officials to a larger extent than others, which is compatible with corruption benefitting the poor more than others.

## 2. Theoretical considerations

How do corruption and judicial accountability affect income inequality and consumption inequality? We here present our theoretical considerations for each type of inequality.

### 2.1. Income inequality

Corruption will increase income inequality if economic institutions and policies, or the degree to which they are enforced, are transformed such that those with higher incomes will benefit to a larger degree. Conversely, corruption will decrease income inequality if those with lower income gain more. The latter outcome may be explained either by those with lower incomes being more effective at using corruption, not least of a petty kind, or by others helping them benefit more than themselves, through the market process or through redistribution. Such outcomes favoring other groups with lower incomes could be accidental or motivated by altruistic concerns – or by insights that "too much inequality" is bad, in the long-term, for overall social cohesion and the society in which they live and, according to the replacement-effect logic, for their own power base.[6]

Low judicial accountability implies corruption in the judicial sphere as well as the absence of protection against corruption in the political sphere, and hence that corruption is more prevalent. The reasoning above for how corruption relates to income inequality thus applies. High judicial accountability indicates the absence of corruption among judges, as well as other unfair influences in the judiciary, and a potentially effective constraint on corruption elsewhere in the public sector. In this case, there is a link to income inequality in the sense that whatever the *de jure* economic institutions and policies are, and whatever distributional outcomes they generate, these are upheld by the legal system (cf. de Soto, 1989). Hence, while we can delineate these "structural" links, on the basis of theory, the relationship could be either positive or negative.

### 2.2. Consumption inequality

Consumption inequality is a function of differences in available resources (net incomes) and differing personal preferences with regard to how much to spend and how much to save (Dynan et al., 2004).[7] Corruption and judicial accountability can thus influence consumption inequality if they affect net incomes, if they affect savings decisions and if they influence consumption opportunities. The effect through incomes was covered in Section 2.1; we now propose three mechanisms linking corruption and judicial accountability to savings decisions and consumption opportunities.

First, corruption can affect the trade-off between consuming and saving by changing capital and consumption taxes and the degree to which these can be exempted or evaded; and judicial accountability makes this more difficult. While people strong in resources can probably exercise more power vis-à-vis the political decision-makers and bureaucrats, people with fewer resources can be more skillful, e.g., through small businesses, to evade the taxes in place. Corruption may therefore lead to more favorable tax rates for or tax evasion from both the relatively rich and the relatively poor, although evasion through operating in the underground economy is a more likely strategy for the poor (Bjørnskov, 2011).

Second, corruption may affect the price structure in a pro-poor direction by enabling increased international trade (Fajgelbaum and Khandelwal, 2016). When, for example, prices on certain goods are higher than in neighboring countries, petty corruption at the border will enable smuggling. As price differences on bulk goods can be sizeable due to trade barriers (Golub and Mbaye, 2009), corruption therefore effectively reduces the prices that people pay on ordinary goods (Schwarz, 2012), which differentially benefits low-income earners.

As for the final mechanism, policies that entail price controls will have similar effects as trade barriers and can affect the consumption opportunities of different groups differently. While Brazil and Chile for example implemented very similar price controls in the early 1970s, they had different economic consequences. As bureaucrats supposed to enforce the price controls could be easily bribed in Brazil but not in Chile, the controls had strongly adverse consequences for the Chilean poor but not those in Brazil (Leff and Heidenheimer, 2017). Actual consumption inequality therefore increased in Chile while the intended effects were offset by corruption in Brazil.[8] Similar effects may also pertain when corruption, at times due to low judicial accountability, allows individuals and other firms to circumvent domestic regulation that create or enforce monopolies (Stigler, 1970).

Hence, as in the case of income inequality, there are theoretical possibilities for either a positive or negative relationship between corruption and consumption inequality. And the higher the judicial accountability, the less corruption, and effects thereof, there will be.

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[6] The spirit of such behavior is captured in the model of Alesina and Angeletos (2005), where elites want to contain public discontent by helping the less well off, and in the model of Acemoglu and Robinson (2006), where politicians can assist the less well off in order to make sure they are not replaced as leaders.

[7] If those with higher incomes save a larger share, this points at consumption inequality being lower than net-income inequality, which is also confirmed in empirical studies for several countries (see note 5 above).

[8] Also see Bergh and Nilsson (2014) for a related finding. They show that the poor can benefit from price changes induced by higher income inequality. The idea is that more poor consumers lead to cheap products becoming more profitable and hence more supplied. They confirm a negative relation between income inequality and the price of inferior goods.

## 3. The data and identification strategy

### 3.1. The data

The data we use cover 145 countries from all over the world for the period 1960–2014 for which we have data on corruption, judicial accountability and the income distribution. Our dependent variables are income and consumption inequality, primarily measured as the shares of total (wage as well as non-wage) incomes obtained per population quintile and as the share of all consumption spent per quintile, but also measured, in a follow-up analysis, in the form of Gini coefficients and the Theil index (for a presentation of the latter, see Conceição and Ferreira, 2000). [9] The income inequality measures capture gross incomes (i.e., incomes before taxes and transfers), which implies that redistribution is ruled out as a direct mechanism through which corruption can affect the studied income distribution. Similarly, the consumption measures capture all consumption enjoyed by each quintile, and thus also capture redistribution as well as the consumption out of unofficial income. The source is the Göttingen Consumption and Income Project (GCIP, 2018), which provides both comprehensive coverage of multiple inequality measures as well as data on decile and quintile income shares. We use these data instead of more commonly used data from the World Bank and the United Nations as the GCIP not only provides one of the largest datasets in which inequality can be broken down to quintile and decile shares, but also provides us with the unique option of comparing income and consumption inequality.

Our main explanatory variables are corruption, judicial accountability, as well as political institutions and their stability. We derive our measure of corruption from the *Varieties of Democracy* (V-Dem) dataset, where we also get a measure of *de facto* judicial accountability (Coppedge et al., 2017a). The V-Dem corruption index is an aggregate of measures of six types of corruption in political and judicial institutions, distinguishing between bribery and embezzlement in executive, legislative and judicial processes. Its intention is to capture both "corruption aimed and influencing law making and that affecting implementation" (Coppedge et al., 2017a, p. 72).[10] The V-Dem corruption measure therefore conceptually captures the type of problems outlined in our theoretical considerations, and it conforms to the general definition of Aidt (2003) presented in the Introduction.

The judicial accountability index from V-Dem is constructed in the same way and intended to specifically capture the likelihood that "judges [who] are found responsible for serious misconduct […] are […] removed from their posts or otherwise disciplined" (Coppedge et al., 2017a, p. 211). One reason for adding this index is to alleviate a well-known problem in corruption research: that the attempt to measure behavior, which the involved parties try to keep a secret, is subject to considerable measurement error. Another reason for exploring both measures is that institutional quality could affect inequality in several other ways than corruption, not least through affecting the degree of protection of private property rights (e.g., Dong and Torgler, 2010). Yet, as judicial accountability is nevertheless associated with better control of corruption at all levels of society, it is therefore strongly (and negatively) correlated with corruption. Not controlling for a factor such as judicial accountability would therefore cause such effects to be captured by our measure of corruption, and vice versa, which would lead to potentially biased estimates. While its inclusion therefore allows us to estimate effects of, e.g., protection of property rights, it also ensures us that we are capturing approximately the full effects of corruption, and no consequences of spuriously correlated factors.[11]

We match these data to information on political institutions from Bjørnskov and Rode (in press). Political institutions – not least democracy as such as well as various features of democracy, such as press freedom, free and recurring elections and a division of power – may help stifle corrupt behavior (Aidt, 2003).[12] They may also affect what the consequences of corruption look like, given that corruption occurs, by contributing to shaping which policies are instituted. One such consequence concerns the distribution and use of resources. These characteristics first include whether the country has a single-party system, is an electoral autocracy – i.e. that it has a multi-party system but where elections are not free and fair and thus cannot lead to a change of government – or if it is a full democracy; the baseline category is countries without elections. From the same source, we obtain information on whether or not the parliament is bicameral and whether

[9] Income is measured net of bribes. However, it must be noted that it is far more difficult to hide consumption, which implies that any corrupt income is likely to affect the distribution of consumption.

[10] For a full description of the V-Dem measurement methodology, see Coppedge et al. (2017b). The V-Dem measure appears very similar to standard alternatives, and for example correlates at about 0.9 with the Transparency International (2018) Corruption Perceptions Index. Admittedly, this type of perceptions-based measure has faced critique, e.g., by Donchev and Ujhelyi (2014), who claim that it is biased downwards and that large countries are penalized since it measures absolute corruption perceptions, and by Ko and Samajdar (2010), who point out the risk of selection bias, longitudinal sensitivity and measurement errors. However, there are also defenders of the measure, most notably Kaufmann et al. (2007), Uslaner (2017) and Versteeg and Ginsburg (2017), who find that different measures capture the same underlying phenomenon. We tend to agree with the defenders. The measure is not without its imperfections, but it seems valid overall and better than available alternatives for a large cross-country sample such as ours. This conclusion obtains support from Gutmann et al. (2018), who document a rather clear positive correlation between perceptions of corruption and experience of corruption, using microdata.

[11] Since corruption is causally affected by judicial accountability (Bjørnskov, 2011), it is possible to imagine a mechanism in which judicial accountability affects corruption that in turn affects the distribution of income or consumption. By directly controlling for judicial accountability, we may underestimate the full effects of such mechanisms, and the estimated effects of corruption in the following can therefore best be thought of as lower-bound estimates of the full effect but correct unbiased estimates of the *direct* effects.

[12] Previous studies have shown that there are links between political institutions and corruption – see, e.g., Gerring and Thacker (2004), Lederman et al. (2005), Dreher et al. (2009) and Bjørnskov (2011).

**Table 1**
Descriptive statistics.

| | Mean | Standard deviation | Observations |
|---|---|---|---|
| Income quintile 1 | 0.049 | 0.027 | 8,839 |
| Income quintile 2 | 0.089 | 0.033 | 8,839 |
| Income quintile 3 | 0.133 | 0.034 | 8,839 |
| Income quintile 4 | 0.199 | 0.027 | 8,839 |
| Income quintile 5 | 0.529 | 0.117 | 8,839 |
| Consumption quintile 1 | 0.065 | 0.019 | 8,839 |
| Consumption quintile 2 | 0.106 | 0.022 | 8,839 |
| Consumption quintile 3 | 0.149 | 0.021 | 8,839 |
| Consumption quintile 4 | 0.212 | 0.017 | 8,839 |
| Consumption quintile 5 | 0.466 | 0.075 | 8,839 |
| Gini coefficient | 0.391 | 0.085 | 8,839 |
| Theil index | 0.272 | 0.145 | 8,839 |
| Log GDP per capita | 8.635 | 1.173 | 7,579 |
| Log population | 1.956 | 1.782 | 7,579 |
| Trade share | 0.478 | 0.520 | 7,579 |
| Government size | 0.196 | 0.106 | 7,579 |
| Investment price | 1.356 | 0.995 | 7,579 |
| Coup, success | 0.022 | 0.152 | 8,739 |
| Coup, failed | 0.026 | 0.163 | 8,739 |
| Single-party regime | 0.201 | 0.401 | 8,672 |
| Electoral autocracy | 0.239 | 0.427 | 8,672 |
| Democracy | 0.454 | 0.498 | 8,672 |
| Bicameral system | 0.419 | 0.497 | 7,386 |
| Proportional voting | 0.439 | 0.496 | 7,087 |
| Large institutional change | 0.115 | 0.319 | 8,784 |
| Log time since change | 2.141 | 1.184 | 8,704 |
| Judicial accountability | 2.019 | 0.955 | 7,597 |
| Political corruption | 0.479 | 0.276 | 7587 |

elections are based on proportional voting or some form of first-past-the-post system. Finally, we capture the stability of political institutions through a measure counting how long ago a major change in political institutions occurred. We define such a change as either a successful coup, the implementation of a new or strongly amended constitution, or non-coup regime transition including peaceful regime transitions. In our data, this latter category mainly consists of democratization episodes.

We follow the general literature on income inequality back to Kuznets (1955) by first adding the logarithm to real GDP per capita and its square. We also include the trade share of GDP, the share of government consumption and the price level of capital relative to the US; the data are all from the Penn World Tables, mark 9.1 (Feenstra et al., 2015). Finally, we add dummies for whether successful and failed coups occurred in a country; these data are from Bjørnskov and Rode in press. While our baseline specification is thus relatively simple, it includes measures of most time-variant factors that the literature has found robust support for, and for which data are available for a large panel of countries. We summarize all data in Table 1, and we present definitions and sources in Table A1 in the Online Appendix.

### *3.2. Identification strategy*

In the following, we estimate a panel with yearly observations and control variables lagged one year, using OLS with two-way fixed effects. As such, the inclusion of year and country fixed effects takes care of all changes due either to common international trends and potential changes in measurement methodology as well as the large number of time-invariant country-specific factors suggested in previous literature (e.g. Treisman, 2000). We note that we cannot fully establish causality in the relation between corruption, judicial accountability and inequality, as several mechanisms exist that could create reverse causality (e.g. Jong-sung and Khagram, 2005). The standard method of applying an instrumental variables estimator is unfortunately not applicable, as it is in practice impossible to find plausibly exogenous and sufficiently strong factors that are also time-variant.

As a key contribution to the literature, we therefore, for the first time in studies of how corruption affects inequality, follow Nizalova and Murtazashvili (2016) in adding an interaction term between corruption and the (logarithm to) time since the last major institutional change (cf. Dreher et al., 2018). As such, we allow the effects of corruption and judicial accountability to vary systematically over time in a particular way.[13] As long as the time since the last change is approximately exogenous to income or consumption inequality, Nizalova and Murtazashvili (2016) show that causality can arguably

[13] To the best of our knowledge, our identification strategy is not only unique in the corruption literature, but is also the first *dynamic* application of Nizalova and Murtazashvili's method of using heterogeneous effects to identify causal associations.

be directly inferable from the effect heterogeneity (the interaction term).[14] In other words, even though we cannot claim that the association that we observe between corruption and inequality *around* regime transitions is causal in a particular direction, any additional effect that arises over time after a major institutional change must be so.

Our causal identification strategy is moreover based on a particular theoretical expectation. Specifically, an increasing effect of corruption in the years after an institutional regime change is fully consistent with Olson's (1982) theory of institutional sclerosis. Olson hypothesized that as political institutions become stable, the cost of all types of rent-seeking decrease, as uncertainty regarding procedures decreases, personal relations are built and bureaucratic and political actors develop ways to avoid detection. In some cases, what would otherwise have been a corrupt relation or expensive lobbying activity becomes built into the logic of the political institutions in the form of standing committees, requirements to hear special interests etc. One of several results of these political problems is that special interests are more able to capture regulatory agencies (Stigler, 1970) or influence decision-makers to favor them (including at the local level, where petty corruption is often present). Olson's (1982) argument was therefore that occasional large-scale political or institutional change is required in order to avoid this situation, which he termed "institutional sclerosis". We note that Olson's empirically backed hypothesis also implies that the distributive effects of changes in corruption and judicial quality would be increasing over time, given that no major changes take place. Hence, when considering a potential moderating effect, we expect a reinforcement: Those that are favored by corruption (in the distribution of income or consumption) are even more favored the more stable the political institutions are. In the following, it is this *increase* that we can plausibly identify as causal.

## 4. Results

### 4.1. Baseline findings

We begin by presenting the baseline findings in Tables 2 and 3, in the form of effects of corruption and judicial accountability, and other explanatory variables, on quintile shares of the distribution of income and consumption, respectively. In both tables, columns 1–5 report the results for the first to fifth quintile for the full sample, while columns 6–10 report results for a subsample where we exclude all observations from non-democracies.

Throughout Tables 2 and 3, stronger judicial accountability is associated with substantially larger top quintile shares, while political corruption is associated with smaller top quintile shares, and particularly so in democracies. Comparing the results for the distribution of income (in Table 2) and consumption (Table 3), we also observe that these associations are significantly stronger for consumption than for income. Hence, what might be called unfair procedures – corruption and deviations from judicial accountability – are related to distributional outcomes that are adverse to the economic elites and beneficial for the relatively worse-off!

Regarding control variables, we observe evidence of a Kuznets Curve for GDP per capita, as well as a more equal distribution of income associated with faster population growth. In addition, international trade is associated with more inequality as more trade can be linked to a concentration of income and consumption in the top quintile. Moreover, while a larger size of government appears to be associated with a more equal distribution of income in Table 2, it is associated with a *less* equal distribution of consumption in Table 3.

As for political institutions, single-party regimes appear to be associated with a concentration of incomes in the top quintile. Yet, focusing on consumption, we find that all party-based regimes have more equal consumption distributions than countries without elections, and that full democracies on average exhibit the most equal consumption distribution (cf. Dorsch and Maarek, 2019). Bicameral regimes tend to have income distributions that benefit the top quintile, but consumption distributions that are slightly skewed towards the fourth quintile. Proportional voting systems are also in general associated with more skewed distributions of income and consumption.[15]

### 4.2. Causal identification

Yet, as noted in Section 3.2, we cannot claim that these associations as such are causal. As a key contribution to the literature we therefore apply the identification strategy described in Section 3.2. In Table 4, we introduce interactions between corruption and judicial accountability and the logarithm to the time since a large institutional change occurred; we illustrate the estimate heterogeneity in Figs. 1 and 2. The basis for this exercise is Olson's (1982) theory of institutional sclerosis: when institutional structures become very stable, rent-seeking in the form of both lobbying and corruption becomes cheaper and special interest groups become an integral part of political and judicial life. As we furthermore include interactions between corruption / judicial accountability and a dummy capturing whether any major institutional change

[14] This assumption implies that our causal strategy is only valid under the assumption that subsequent institutional stability after an institutional change is not affected by the initial distribution of consumption or income. While one might be able to set up a theoretical model in which distributional aspects affect institutional stability, the association depicted by Fig. A1 in the Online Appendix indicates that this is not likely to be an actual problem. Further results in Table A5 also suggest that this is not the case.

[15] Although previous research has not explored the apparently equalizing effects of successful coups, the effect may not be entirely unexpected. The purpose of many coups is to remove an entrenched political elite that in most cases enjoy substantial rents. If that happens, we would expect to observe a decline, although perhaps only temporarily, in the income or consumption share of the elite.

**Table 2**
Main results, income distribution.

| | All countries | | | | | Democratic subsample | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1<br>Q 1 | 2<br>Q 2 | 3<br>Q 3 | 4<br>Q 4 | 5<br>Q 5 | 6<br>Q 1 | 7<br>Q 2 | 8<br>Q 3 | 9<br>Q 4 | 10<br>Q 5 |
| Log GDP per capita | −2.980*** (.361) | −2.476*** (.375) | −1.594*** (.381) | .198 (.404) | 6.868*** (1.326) | −3.232*** (.435) | −3.294*** (.444) | −3.224*** (.449) | −2.359*** (.484) | 12.085*** (1.553) |
| Log GDP per capita squared | .179*** (.022) | .146*** (.022) | .089*** (.023) | −.019 (.024) | −.396*** (.079) | .190*** (.025) | .187*** (026) | .176*** (.026) | .119*** (.028) | −.671*** (.090) |
| Log population | .139 (.108) | .323*** (.112) | .450*** (.114) | .373*** (.121) | −1.275*** (.397) | −.132 (.125) | .197 (.128) | .621*** (.129) | .931*** (.139) | −1.589*** (.447) |
| Trade share | −.375*** (.076) | −.294*** (.079) | −.283*** (.079) | −.222*** (.085) | 1.156*** (.277) | −.348*** (.083) | −.279*** (085) | −.255*** (.086) | −.169* (.092) | 1.026*** (.296) |
| Government size | .871*** (.174) | .944*** (181) | .969*** (.184) | .906*** (.195) | −3.572*** (.639) | .886*** (214) | .862*** (.219) | .832*** (.221) | .674*** (.238) | −3.076*** (.765) |
| Investment price | −.041*** (.016) | −.031* (.017) | −.008 (.017) | .049*** (.018) | .031 (.061) | −.054*** (.020) | −.059*** (.021) | −.035* (.021) | .036 (.023) | .114 (.073) |
| Coup, success | .112 (.109) | .102 (.114) | −.004 (.116) | −.216* (.123) | .009 (.402) | .223* (132) | .179 (135) | .001 (.137) | −.305** (.147) | −.092 (.473) |
| Coup, failed | −.081 (.078) | −.066 (.081) | −.034 (.082) | .060 (.087) | .118 (.287) | −.152* (.091) | −.163* (.093) | −.130 (.094) | .003 (.101) | .443 (.326) |
| Single-party regime | −.267*** (.101) | −.304*** (.105) | −.268** (.106) | −.099 (.113) | .929*** (.370) | – | – | – | – | – |
| Electoral autocracy | −.157 (.096) | −.086 (.099) | .027 (.101) | .227** (.107) | −.007 (.352) | – | – | – | – | – |
| Democracy | −.318*** (.099) | −.169* (.103) | −.003 (.104) | .219** (.110) | .273 (.362) | .026 (.054) | .075 (.055) | .078 (.056) | .009 (.060) | −.192 (.193) |
| Bicameral system | −.357*** (.047) | −.299*** (.049) | −.190*** (.049) | −.039 (.053) | .886*** (.174) | −.302*** (.054) | −.281*** (.055) | −.191*** (.055) | −.050 (.059) | .825*** (.191) |
| Proportional voting | −.467*** (.056) | −.572*** (.059) | −.628*** (.059) | −.545*** (.063) | 2.194*** (.207) | −.219*** (.069) | −.467*** (.071) | −.635*** (072) | −.653*** (.078) | 1.949*** (.249) |
| Judicial accountability | −.151*** (.036) | −.144*** (.037) | −.101*** (.038) | −.011 (.040) | .395*** (.132) | −.139*** (.039) | −.073* (.041) | .023 (.041) | .151*** (.044) | .019 (.142) |
| Political corruption | .196 (.136) | .022 (.142) | .172 (.144) | .579*** (.153) | −1.048** (.501) | .624*** (.166) | .414*** (.169) | .488*** (.171 | .655*** (.185) | −2.299*** (.592) |
| Observations | 6172 | 6172 | 6172 | 6172 | 6172 | 5043 | 5043 | 5043 | 5043 | 5043 |
| Countries | 145 | 145 | 145 | 145 | 145 | 142 | 142 | 142 | 142 | 142 |
| Within R squared | .099 | .071 | .058 | .049 | .066 | .079 | .065 | .066 | .066 | .067 |
| F statistic | 9.38 | 6.47 | 5.26 | 4.45 | 6.04 | 6.06 | 4.94 | 4.99 | 5.04 | 5.12 |

*** (**) [*] denote significance at $p<.01$ ($p<.05$) [$p<.10$].

**Table 3**
Main results, consumption distribution.

| | All countries | | | | | Democratic subsample | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1<br>Q 1 | 2<br>Q 2 | 3<br>Q 3 | 4<br>Q 4 | 5<br>Q 5 | 6<br>Q 1 | 7<br>Q 2 | 8<br>Q 3 | 9<br>Q 4 | 10<br>Q 5 |
| Log GDP per capita | −3.303*** (.312) | −3.363*** (.341) | −2.765*** (.347) | −1.366*** (.346) | 10.797*** (1.191) | −2.961*** (.354) | −3.412*** (.389) | −3.098*** (.413) | −1.883*** (.427) | 11.355*** (1.419) |
| Log GDP per capita squared | .189*** (.019) | .189*** (.020) | .150*** (.021) | .064*** (.021) | −.593*** (.071) | .171*** (.021) | .193*** (.023) | .169*** (.024) | .092*** (.025) | −.626*** (.083) |
| Log population | .797*** (.093) | 1.052*** (.102) | 1.129*** (.104) | .861*** (.104) | −3.838*** (357) | .544*** (.102) | .864*** (.112) | 1.033*** (.119) | .894*** (.123) | −3.334*** (.408) |
| Trade share | −.259*** (.065) | −.205*** (.071) | −.058 (.072) | .198*** (.072) | .324 (.249) | −.229*** (.068) | −.189** (.074) | −.012 (.078) | .308*** (.081) | .124 (.271) |
| Government size | −1.385*** (.150) | −.205*** (.071) | −.612*** (.167) | .420** (.167) | 2.702*** (.574) | −1.528*** (.174) | −1.277*** (.192) | −.733*** (.204) | .451** (.210) | 3.088*** (.699) |
| Investment price | −.005 (.014) | −.011 (.016) | .002 (.016) | .032** (.016) | −.018 (.054) | −.017 (.017) | −.031* (.018) | −.012 (.019) | .048** (.02) | .012 (.067) |
| Coup, success | .319*** (.095) | .416*** (.104) | .364*** (.105) | .133 (.105) | −1.231*** (.361) | .283*** (.108) | .274** (.119) | .183 (.126) | −.003 (.129) | −.736* (432) |
| Coup, failed | −.064 (.067) | −.065 (.074) | −.087 (.075) | −.088 (.075) | .304 (.258) | −.152** (.074) | −.137* (.082) | −.121 (.087) | −.048 (.089) | .457 (.298) |
| Single-party regime | .330*** (.087) | .479*** (.095) | .433*** (.097) | .095 (.097) | −1.334*** (.333) | – | – | – | – | – |
| Electoral autocracy | .372*** (.083) | .575*** (.091) | .599*** (.092) | .298*** (.092) | −1.842*** (.316) | – | – | – | – | – |
| Democracy | .686*** (.085) | .979*** (.093) | .989*** (.095) | .527*** (.095) | −3.177*** (.325) | .377*** (.044) | .437*** (.048) | .389*** (.051) | .192*** (.053) | −1.393*** (.176) |
| Bicameral system | −.004 (.041) | −.003 (.045) | .009 (.045) | .024 (.045) | −.024 (.156) | −.122*** (.044) | −.096** (.048) | −.028 (.051) | .124** (.053) | .122 (.175) |
| Proportional voting | −.119** (.049) | −.179*** (.053) | −.202*** (.054) | −.167*** (.054) | .666*** (.186) | −.003 (.057) | −.102 (.062) | −.124* (.066) | −.070 (.068) | .299 (.228) |
| Judicial accountability | −.339*** (.031) | −.341*** (.034) | −.276*** (.034) | −.070** (.034) | 1.026*** (.118) | −.239*** (.032) | −.215*** (.036) | −.141*** (038) | .039 (.039) | .556*** (.129) |
| Political corruption | .272** (.118) | .186 (.129) | .286** (.131) | .638*** (.131) | −1.379*** (.450) | 1.074*** (.135) | 1.008*** (.149) | .984*** (.158) | .923*** (.163) | −3.986*** (.541) |
| Observations | 6172 | 6172 | 6172 | 6172 | 6172 | 5043 | 5043 | 5043 | 5043 | 5043 |
| Countries | 145 | 145 | 145 | 145 | 145 | 142 | 142 | 142 | 142 | 142 |
| Within R squared | .117 | .113 | .108 | .109 | .109 | .117 | .099 | .097 | .125 | .096 |
| F statistic | 11.31 | 10.85 | 10.29 | 10.37 | 10.42 | 9.39 | 7.86 | 7.60 | 10.15 | 7.55 |

*** (**) [*] denote significance at p<.01 (p<.05) [p<.10].

**Table 4**
Conditional results, both distributions, democratic subsample.

| | Income distribution | | | | | Consumption distribution | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Q 1 | Q 2 | Q 3 | Q 4 | Q 5 | Q 1 | Q 2 | Q 3 | Q 4 | Q 5 |
| Large institutional change | −.003 (.003) | .002 (.003) | .004 (.003) | .002 (.003) | −.006 (.009) | .004* (.002) | .006** (.002) | .005* (.003) | .001 (.003) | −.015* (.009) |
| Judicial accountability | −.004*** (.001) | −.001 (.001) | .001* (.001) | .003*** (.001) | .000 (.002) | −.001*** (.001) | .000 (.000) | .001* (.001) | .002*** (.001) | −.002 (.002) |
| Political corruption | .003 (..002) | .006** (.002) | .007*** (.003) | .008*** (.003) | −.026*** (.009) | .008*** (.002) | .009*** (.002) | .009*** (.002) | .006** (.002) | −.032** (.008) |
| Log time since change | −.003*** (.001) | .001 (.001) | .002** (.001) | .002* (.001) | −.002 (.003) | .001 (.001) | .002*** (.001) | .002** (.001) | .000 (.001) | −.005* (.003) |
| Accountability * large change | .001 (.001) | −.000 (.001) | −.001 (.001) | −.001 (.001) | .001 (.003) | −.001*** (.000) | −.002*** (.001) | −.002*** (.001) | −.001 (.001) | .007** (.003) |
| Corruption * large change | .002 (.003) | −.001 (.003) | −.002 (.003) | .000 (.003) | .001 (.010) | .002*** (.001) | −.003 (.003) | −.002 (.003) | .001 (.003) | .005 (.009) |
| Accountability * time | .001*** (.000) | .000 (.000) | −.000* (.000) | −.001*** (.000) | −.000 (.001) | −.000** (.000) | −.001*** (.000) | −.001*** (.000) | −.001*** (.000) | .004*** (.001) |
| Corruption * time | .001 (.001) | −.001 (.001) | −.001 (.001) | −.001 (.001) | .001 (.003) | .002** (.001) | .000 (.001) | .001 (.001) | .002*** (.001) | −.005 (.003) |
| Observations | 5043 | 5043 | 5043 | 5043 | 5043 | 5043 | 5043 | 5043 | 5043 | 5043 |
| Countries | 142 | 142 | 142 | 142 | 142 | 142 | 142 | 142 | 142 | 142 |
| Within R squared | .085 | .069 | .069 | .069 | .070 | .129 | .115 | .111 | .132 | .110 |
| F statistic | 5.91 | 4.70 | 4.71 | 4.69 | 4.80 | 9.42 | 8.22 | 7.91 | 9.66 | 7.84 |

*** (**) [*] denote significance at $p<.01$ ($p<.05$) [$p<.10$].

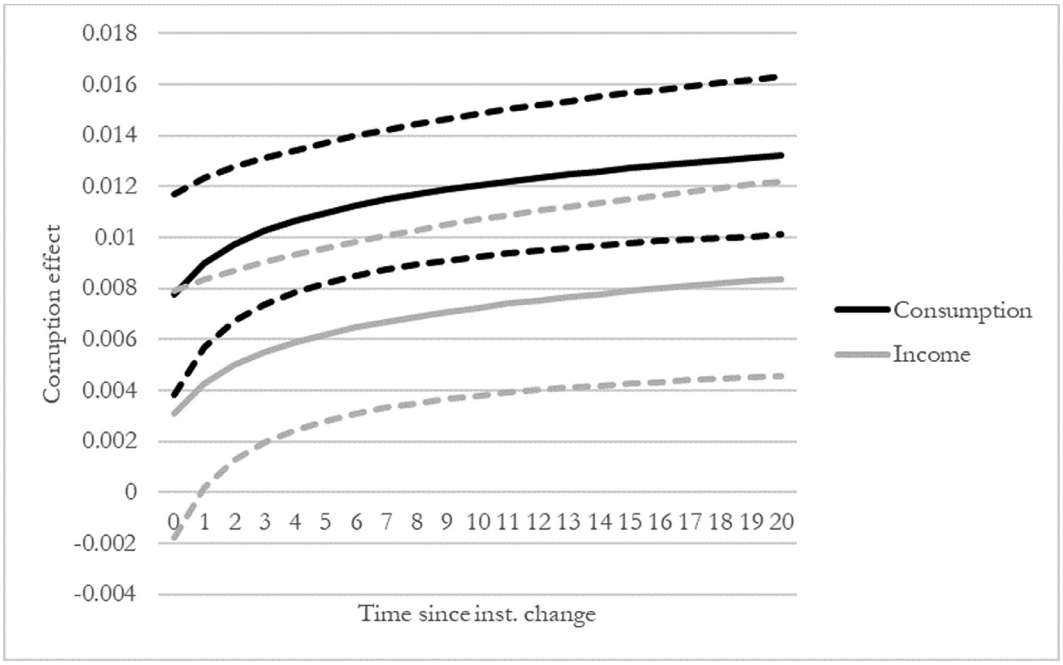


**Fig. 1.** Marginal effects of corruption on inequality, bottom quintile of income versus consumption distribution.

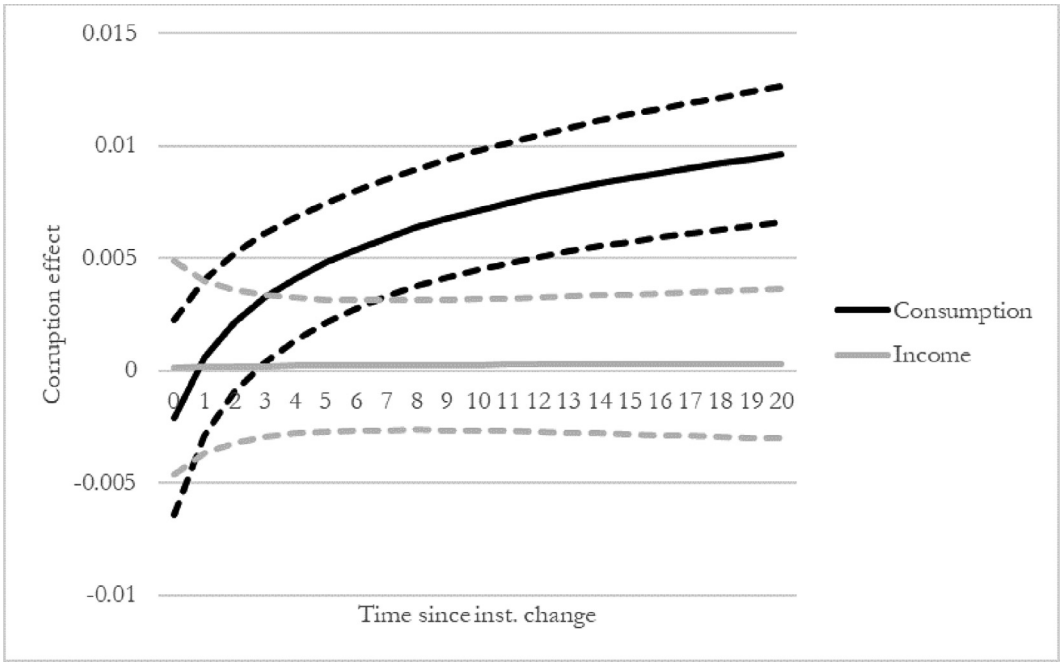


**Fig. 2.** Marginal effects of judicial accountability on inequality, top quintile of income versus consumption distribution.

took place in a given year, any effect of political corruption and judicial accountability that is increasing over time as the institutional structure becomes entrenched can thus be interpreted causally.

This is exactly what we observe in Table 4 (which includes an identical baseline specification as previous tables and which is based on our democratic subsample). We illustrate the findings in Fig. 1, which depicts the marginal effect of corruption on the share pertaining to the bottom quintile of income and consumption and Fig. 2, showing the marginal effect of judicial accountability on the top quintiles of the income and consumption distributions. We refrain from plotting

the rest of the associations as they either are insignificant in Table 4 or subsequently prove to be fragile (see Tables A3 and A4 in the Online Appendix).

While the estimates in Table 4 and the illustration in Fig. 1 seem to show heterogeneity over time in the case of income, those results prove to be fragile in our ensuing regional jackknife analysis (see below), and for income we consequently cannot claim any causal evidence. However, the effects of corruption on the distribution of consumption are clearly increasing in the time since the last major institutional change. After about ten years, the estimate on the bottom quintile of the distribution of consumption is approximately .012 – calculated as the "pure" estimate plus the interaction term times the log to 10 – and significantly different from the estimate at time zero. In other words, a one standard deviation change in corruption is associated with a long-run increase in the share of the bottom quintile of about 7–8% . We observe quite similar effects of judicial accountability that do not appear heterogeneous for the distribution of income, but clearly are so for the distribution of consumption. The heterogeneity is evident in Fig. 2 where the association between judicial accountability is clearly zero for the top income quintile, but strongly increasing over time for the top consumption quintile.

Hence, while we cannot claim that the *full* estimates of corruption – the pure estimate of corruption plus the interaction effect – or that the full estimates of judicial accountability can be thought of as causal, we can still make causal claims. Because the time since the last major institutional change is exogenous to the quintile consumption shares, we can with statistical confidence say that the *increases* in the estimates that occur over the time since the last major institutional change *causally* affect the distribution of consumption. For example, the estimate of corruption of .008 on the bottom consumption quintile may or may not be causal, but the significant increase of an additional .004 after ten years can be interpreted as evidence of a causal effect of corruption.

Moreover, we are confident that the mechanisms through which this effect runs is distinct from any mechanisms affecting the distribution of income. Because we include judicial accountability and find a similar pattern of heterogeneity in the estimates of judicial accountability, which even appears somewhat stronger for the consumption distribution, we can be quite certain that the identified corruption effects do not merely reflect consequences of other parts of the institutional framework such as the quality of judicial institutions or the shape of political institutions, which would be captured by the inclusion of judicial accountability and democracy. Consistent with our theoretical considerations, we therefore find that institutional features not related to the control of corruption also affect the distribution of income and consumption in the longer run, as judicial accountability also appears important (cf. Dreher and Schneider, 2010; Bjørnskov, 2011).

### *4.3. Sensitivity analysis*

So far, the results show substantial support for equalizing effects of political corruption on consumption, and most likely that judicial accountability has the opposite effect. Yet, the option remains that these findings are specific to exploring quintile shares of the distribution of income and consumption, and that the overall findings are driven by specific countries or small groups of countries. We therefore perform the following sensitivity analyses.

We first re-estimate our main findings using two measures of the overall shape of the consumption distribution: Gini coefficients and the Theil index. We report the findings in Table A2 in the Online Appendix, using the full sample in columns 1 and 2 and the democratic subsample in columns 3 and 4. The overall findings are similar to those in Tables 2–4 with evidence for a Kuznets Curve, population effects and a positive association with the size of government. We also observe more evidence for the equalizing effects of coups and consequences of democratic political institutions. Most importantly, we can confirm a negative association between corruption and consumption inequality, with substantial evidence for heterogeneous effects of corruption and judicial accountability across the distribution of consumption. The strongly significant interaction terms in the lower panel of Table A2 show that the effects of corruption and judicial accountability are increasing in institutional stability, and a comparison between estimates using the full sample and the democratic subsample provide clear indications that these effects are stronger in democratic societies. Our main findings therefore do not appear to be specific to a particular way of measuring consumption inequality.

Second, we have performed two jackknife exercises to investigate whether there are particular regions in the world that drive the results and whether they can be associated with particular decades. The regions that we included are the West, South East Asia, the rest of Asia, North Africa and the Middle East, Sub-Saharan Africa, Latin America and the Caribbean, and the Pacific. The results, reported in Table A3 in the Online Appendix, show the particular results for effects of corruption on the bottom quintile of the consumption distribution, and effects of judicial accountability for the top quintile of the consumption distribution, that are statistically robust and not driven by single regions or decades. A further country jackknife (not shown) furthermore support these two particular results. There is, however, one exception: The heterogeneity over time we identified in Fig. 1 for the marginal effects of corruption on the income share of the bottom quintile is not robust to our region jackknife test: the distribution changes shape when excluding Asia, and the differences over time become insignificant when excluding the Western countries.

A further worry could be that some of our findings are driven by observations that are interpolated in the GCIP dataset. We deal with this problem in Table A4 in the Appendix, where we delete all obviously interpolated data, which we identify when income or consumption shares do not change at all from year to year, or if the changes perfectly follow a linear change (i.e., a linear interpolation) between years. As is evident in the table, this final test reaffirms our main findings for corruption (the bottom quintile) and judicial accountability (the top quintile). On this basis, we conclude that the main results are statistically robust, and also that the size of the estimates appear relatively stable across tests.

Next, the results may reflect purely distributional changes or differential *growth* performance across quintiles. We address this concern in Table A6 in the Online Appendix, where we instead of consumption shares use the log of absolute consumption levels within each decile. Bearing the caveat in mind that the main assumptions behind our causal identification do not apply to these estimates, more corruption is associated with substantial declines in the consumption level of the fifth quintile, whereas improvements in judicial accountability are associated with consumption gains for the fifth quintile in the long run. [16] If one was to interpret these results as causal – which we advise against – they would indicate that the equalizing effects of corruption are mainly due to destructive effects for the relatively highest income earners. The slight indications of heterogeneity across quintiles may be taken to suggest that our results are not likely to be driven by pure growth differences.

Finally, to ease concerns about the error terms of the five quintile regressions being correlated, we have estimated a set of seemingly unrelated regressions with regional fixed effects (see Table A7 in the Online Appendix). Even with the substantially different estimator, we get very similar results as in Table 4. While we cannot claim that these estimates are conclusive, the results from applying seemingly unrelated regressions at least indicate that our main results are unlikely to be fragile to problems deriving from cross-equation contemporaneous correlations in the error terms.[17]

## 5. Conclusions

In our desire to pinpoint how corruption and judicial accountability affect inequality, we have explored a large cross-country sample covering more than half a century, which we uniquely collect by combining data on the income distribution from the Global Consumption and Income Project with institutional data from the Varieties of Democracy project. Contrary to common intuition, our results reveal that corruption is related to both income and consumption inequality in a negative way and that judicial accountability is related to these inequality indicators in a positive way. This suggests that the relative position of economic elites worsens with corruption, which in turn indicates either that other parts of the income and consumption distributions are better able to take advantage of corruption, e.g., by evading taxes and regulations, or that the elites, either consciously or unconsciously, use their *de facto* power to favor others more than themselves (perhaps in a preemptive way to retain power). Conversely, judicial quality appears to protect the consumption shares of the economic elite, indicating that having accountable judiciaries may serve to fossilize an unequal distribution of consumption in society.

For average effects of corruption or judicial accountability we cannot claim any causal inference. However, as a central contribution to the literature, we are the first to follow recent studies from related fields in establishing causality by exploring effect heterogeneity. We do so by applying Nizalova and Murtazashvili's (2016) insight that interaction terms under specific conditions can inform about causality, and we moreover apply a specifically dynamic version of the argument: Interacting corruption and judicial accountability with the time since the last major change in political institutions allows us to test a version of Olson's institutional sclerosis thesis, which uniquely also allows us to draw partial causal inference. Assuming that the time since the last major change is exogenous to inequality – an assumption that we cannot test but which the available data, as shown in Fig. A1 in the Online Appendix, strongly indicate – we find that the effects of corruption and judicial accountability are increasing in this factor for consumption inequality. In other words, we observe that corruption contributes to a more equal distribution of consumption and that judicial accountability contributes to a less equal distribution the longer the political institutions have been stable. These implications are independent of the specific way we measure inequality, are valid across time and regions and are not specific to autocracies.

We see this study as a contribution to the literature on the consequences of institutional quality that also sheds new light on the determinants of inequality. Our findings suggest that although corruption and poor judicial institutions may violate norms of just conduct and give rise to other detrimental outcomes, they need not necessarily worsen inequalities in society. Moreover, judicial quality, despite its positive connotations, may indeed do the opposite. Yet, we must emphasize that both corruption and judicial accountability also affect long-run growth such that investing in accountability and combatting corruption would lead to *absolute* advances for the entire society.

Both factors could also, in principle, affect the precision of national accounts data if, for example, the relatively rich either avoid corruption by diverting consumption to other countries, or use corrupt practices to hide both income and consumption from regular measurement. In addition, while we observe distributional changes, we have no way of knowing whether corruption and institutional accountability affect the degree of social mobility. In other words, we observe changes in the distributions of consumption, but do not know how likely individuals and individual households are to stay in specific parts of the distribution. Our findings nevertheless seem to us important to take into careful account when considering policy

[16] While we argue that the identifying assumption that the stability of institutional changes is approximately orthogonal to the distribution of income or consumption, we cannot make the same claim when it comes to absolute income or consumption levels. The reason is that institutional stability is known to be more likely in relatively rich countries. As all dependent variables in Table A2 are highly correlated with overall economic growth, which we cannot claim is plausibly exogenous to institutional quality or, indeed, to the stability of political institutions, our identification strategy is compromised when we employ absolute levels (cf. Przeworski, 2005; Rock, 2009).

[17] Additionally, we have experimented with adding a number of other control variables. We do not report any such results here, as this exercise may be problematic for two reasons. First, adding variables that to some extent picks up relevant policy changes implies that we would be controlling for likely transmission mechanisms and thus add "bad controls" (Angrist and Pischke, 2009, ch. 3). Second, many such variables are only available for a subset of our countries or only available in recent years, and thus substantially restrict the sample. However, we have found no additional control variables that challenged our main findings.

measures that try to combat corruption and strengthen judicial accountability: possible side effects along distributional margins may need to be deliberately counteracted.

## Declaration of Competing Interest

None.

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## Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.jebo.2019.12.010.

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