

The Effect of Democracy on Corruption: Income is Key

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Summary. — This paper provides an explanation for the ambiguous relationship between democracy and corruption. Using rich panel data with annual observations from 1998 to 2012 allows us to control not only for country- and time-invariant factors but also for potential reverse causality between corruption and income levels in a 3SLS framework. Democracy reduces corruption but only in economies that have already crossed a GDP/capita level of approximately US\$2,000 (in 2005 US\$). For poorer nations, democratization is suggested to increase corruption. Other institutional characteristics are unlikely to drive this result and findings are robust to a variety of robustness checks and quantile regressions.

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1. INTRODUCTION

Despite the substantial literature concerning corruption determinants, a clear consensus related to the role of democracy is yet to emerge. Are democratic countries less prone to corrupt behavior than non-democratic regimes? Understanding the link between regime types and corruption levels is fundamental, especially considering recent political developments around the globe, such as the Arab Spring or the current crisis in Ukraine, which has been traced to increasing corruption levels after transitioning to democratic structures in the post-Soviet era. First, it may help explain why many countries experience *higher* corruption levels after democratization, even though conventional wisdom would predict otherwise. Second, it may help policymakers make well-informed decisions, understanding the potential consequences of democratization.

The following analysis provides an explanation for why some countries, such as Ukraine, may struggle with widespread corruption after turning away from autocratic structures, such as the Soviet Union. Once a nation moves away from autocratic structures (where participation in the public sector is impossible for the average citizen) to a democratic institutional framework, opportunities arise to abuse the newly found political power. Citizens will find a whole new set of options to participate in shaping governments with public offices becoming available to people not directly associated with the previous autocratic regime. In the spirit of Acemoglu, Johnson, and Robinson (2005), *de jure* political power shifts from a small elite to broad masses, at least partially. Thus, the opportunity to engage in corrupt activities opens up for the majority of people, who previously had no access to the public sector, and consequently, corruption may increase. However, corruption may decrease because we now observe competition over public funds in a democratic institutional setting (see Mohtadi & Roe, 2003, for a theoretical framework). Thus, *a priori*, it is not clear whether democracy should increase or decrease corruption. So, when would one decide to abuse this newly found political power to engage in corrupt activities?

Our empirical analysis points toward income levels as an essential ingredient: if a country has not yet reached a certain development level (a GDP per capita of approximately US\$2,000), democratization is accompanied by increasing cor-

ruption. An explanation for this finding, although speculative at this point, may be that in poorer countries the outside option of working in the productive sector is not lucrative enough to prevent the misuse of public funds. In other words, taking advantage of public funds may appear more attractive if the alternative income from working in the productive sector is sufficiently small. However, after a certain development level is reached, democratization actually decreases corrupt activities, as suggested by the traditional literature (e.g., Sandholtz & Koetzle, 2000; Shleifer & Vishny, 1993; and Treisman, 2000). Beyond this point, the richer the country, the more democratization will reduce corruption.

Our analysis incorporates the benchmark control variables of the associated corruption literature, and, in addition, it addresses a variety of notorious problems that have bothered this line of research. First, and most importantly, we show that the link between democracy and corruption remains ambiguous if one does not consider the above-mentioned heterogeneity in income. Second, we incorporate two-way fixed effects, allowing us to control for any country- and time-invariant unobservables. Third, we show that this nonlinearity along the lines of income remains robust to the inclusion of a battery of other potential corruption determinants, particularly other institutional characteristics. Fourth, we address the potential endogeneity problem of income—richer countries may be less corrupt, but less corrupt countries may also be richer—in a simultaneous estimation framework (Three-Stage-Least-Squares, 3SLS). Fifth and finally, we use quantile regression analysis to show that this result does not change across different levels of corruption; it is observed throughout the entire distribution, ranging from the most corrupt nations, such as Afghanistan or Somalia, to the cleanest economies, such as Finland or New Zealand.

The following section provides a brief overview of the related literature, introducing the intuition for our hypothesis. Section 3 summarizes our methodology. Section 4 presents our

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data, whereas Sections 5–7(c) show our empirical results. Finally, Section 8 provides a brief discussion of our findings.

2. BACKGROUND

(a) Previous research on the effect of democracy on corruption

A general problem in analyzing corruption determinants is that one unifying theoretical framework does not exist. For example, the seminal paper by [Shleifer and Vishny \(1993\)](#) provides an intuition as to how the structure of public institutions determines corruption, but many empirically identified correlates, such as overall income levels or historical aspects, are naturally not captured by their model. This is not surprising given the long and colorful list of corruption determinants that have been suggested at some point by empirical analyses.

The idea that democratization can increase corruption in the short run dates back to [Huntington \(1968, first version\)](#), attributing this phenomenon to underdeveloped institutional frameworks in young democracies. In a more recent study, [Andvig \(2006\)](#) argues “the larger the norm shifts, the larger the prospects for corruption” in general in transition economies. A priori, we could distinguish between two basic consequences from a democratization: (1) increasing corruption, as more people have access to public funds and positions in the public sector and (2) decreasing corruption, introducing competition over the use of public funds and the filling of government positions.

For instance, [Mohtadi and Roe \(2003\)](#) create an endogenous growth model and find that corrupt activities may first increase after democratization but could decrease naturally over time, owing to more competition among rent seekers. In a similar vein, [Ehrlich and Lui \(1999\)](#) and [Corchón \(2008\)](#) find that an autocratic regime may actually produce less corruption than a democratic setting if parliament is dominated by rent seekers. Due to the difficulty of comprehensively modeling corrupt behavior, the associated literature has mostly turned to empirical methodologies. Focusing on characteristics surrounding democracy and its link to corruption, [Table 1](#) provides a basic overview of the most recent empirical

studies. Most articles find that democracy reduces corruption, although a curious nonlinearity is noted in at least five of these works.

(b) Why income levels could matter

To the best of our knowledge, no paper explicitly highlights income levels as the mitigating factor relating democracy to corruption.¹ In general, the degree of economic development has been shown to affect corruption levels directly (see [Treisman, 2000](#), or [Serra, 2006](#), among many others). Our analysis extends the importance of economic development in explaining the democracy–corruption link. We propose that if basic income levels are not met, newly found political power will be abused for private gains. If countries are sufficiently poor, individuals face limited income opportunities in the productive sector, and political power may simply represent an opportunity to increase one’s meager income. However, after a basic degree of economic development is reached, political power does not seem to be corrupted on a systematic basis. In the spirit of [Becker \(1974\)](#), criminal acts are more likely to be committed if alternative options are scarce and not promising substantial income. Higher income levels provide more lucrative opportunities for the individual in the productive sector. If an individual receives political power in a position where basic needs are met the traditional hypothesis about democratization reducing corruption may be accurate.²

To formalize this notion, consider an economy normalized to one with a fraction of p private, identical citizens. On the other hand, a fraction of $e = 1 - p$ represents the political elite. Consistent with the concept of a small societal elite, assume $p > e$. In times of autocracy, a private person has no access to political power (and therefore corruption), and her utility consists of

$$U_p = y(1 - t), \quad (1)$$

where y represents her positive wage and t the exogenously fixed tax rate with $0 \leq t \leq 1$. Further assume that the political elite (e) is not constrained, meaning that committing corrupt acts does not impose any cost on them, neither in monetary nor moral terms. This assumption will be relaxed

Table 1. Literature on the effect of democracy on the absence of corruption

Author	Conclusion	Data	Measurement of democracy
Iwasaki and Suzuki (2012)	Positive relationship	Panel 1998–2006	Democratization policy index (World Bank)
Billger and Goel (2009)	“Democracy is likely more effective in the conditionally most corrupt nations”	CS ^a observations from 2001 to 2003	Political Rights and Civil Liberties (Freedom House)
Rock (2009)	U relationship	Panel 1982–1997	Democratic years
Serra (2006)	Consecutive democracy has a positive effect on corruption	CS ^a average values 1990–1998.	Political rights index (Freedom House); Dummy for democracy uninterrupted for a 46 year period (1950–1995)
Sung (2004)	Cubic relationship	Panel 1995–2000	Political Rights Index (Freedom House)
Chowdhury (2004)	Positive relationship	CS ^a , Panel 1995–2003	Vanhanen’s democratization index (PRIO)
Paldam (2002)	“The independent effect of democracy is dubious”	CS ^a 1999	Gastil index (Freedom House).
Sandholtz and Koetzle (2000)	Positive relationship	CS ^a 1996	Political Rights and Civil Liberties (Freedom House). Democratic Years
Treisman (2000)	Consecutive democracy has a positive effect on corruption	CS ^a 1996, 1997, 1998	Political liberties (Freedom House). Democratic years

^a Pure cross-sectional analysis with one observation per country.

below for the ordinary citizen. Consequently, a member of the elite chooses the degree of corruption α (with $0 \leq \alpha \leq 1$) to maximize her utility:

$$U_e = y + \alpha \frac{pty}{e}. \quad (2)$$

In other words, all tax income (pty) is equally accessible by all members of the elite (e). It is straightforward to see that the elite is not facing any constraint and each member of the elite is choosing $\alpha = 1$ in equilibrium. The overall degree of corruption as a percentage of GDP will then be³

$$\left(\frac{corr}{GDP}\right)_{autoc} = pt. \quad (3)$$

Now consider a democratization, where public power shifts uniformly to the masses. Specifically, utility functions now become

$$U_e = y(1 - t) + \alpha ty \quad (4)$$

and

$$U_p = y(1 - t) + \beta ty - (\beta y)^{1+\gamma}. \quad (5)$$

First, a former member of the elite now needs to pay taxes like everybody else, but it is possible for her to recover the entirety of her taxes by corrupt activities. The private citizen can do the same (with $0 \leq \beta \leq 1$), but is bound by a standard cost function $(\beta y)^{1+\gamma}$ with $0 \leq \gamma \leq 1$. Intuitively, more corruption (i.e., a larger β) imposes both moral costs on her (indicated by β in the cost function) and these costs are increasing with income levels (indicated by y in the cost function). The first assumption is merely a representation of monitoring efforts, as more corruption is increasing the expected cost of detection. The second assumption is consistent with a number of associated findings in the existing literature, indicating that larger income levels cause corruption to decrease (see Treisman, 2000, for example). Note that with γ , the cost parameter associated with the risk of detection and moral doubts about committing corrupt acts, being a positive fraction the cost function is increasing in both β and y at increasing rates, consistent with a generic cost function. Thus, minor corrupt acts (a low β) impose lower marginal costs than larger corrupt acts.

The resulting equilibrium corruption levels in a democratic regime are then simple to derive by maximizing Eqns. (4) and (5) with respect to α and β . As before, the previous elite is not bound by any costs and will choose $\alpha = 1$. Every ordinary citizen will choose $\beta = \left(\frac{t}{(1+\gamma)y^\gamma}\right)^{\frac{1}{\gamma}}$. Overall, society will suffer from an absolute degree of corruption indicated by $ety + pty\left(\frac{t}{(1+\gamma)y^\gamma}\right)^{\frac{1}{\gamma}}$. In relative terms to GDP, corruption occupies the following share:

$$\left(\frac{Corr}{GDP}\right)_{democ} = et + pt\left(\frac{t}{(1+\gamma)y^\gamma}\right)^{\frac{1}{\gamma}}. \quad (6)$$

Finally, the effect of a democratization on the degree of corruption will then depend on income levels (y). To see this, compare Eqn. (6) to (3) if

$$y < \frac{p\left(\frac{t}{1+\gamma}\right)^{\frac{1}{\gamma}}}{p - e}, \quad (7)$$

then corruption will actually be larger in the democratic regime than under autocracy. If income is larger, on the other hand, a democratization will decrease corruption.

It is important to place this hypothesis in the context of the overall literature on corruption determinants. Beyond the effects of democracy, numerous correlates have been proposed. Seminal works here include the comprehensive cross-country analysis conducted by Treisman (2000) and the more recent extreme-bounds analysis by Serra (2006). Their studies identify five factors that are consistently associated with lower corruption levels: Protestant traditions, histories of British rule, higher levels of income and imports, and long-standing history of democratic institutions. Colonial heritage and federal structure, however, are associated with higher corruption levels.

Our analysis is able to control for all of these characteristics, thereby attempting to isolate the relationship between democracy and corruption. It is important to note that using repeated cross-country data allows for incorporating country fixed effects. Thus, we are able to control for any unique country-specific characteristics and not only the commonly suggested aspects, such as Protestant tradition or colonial rule. Finally, recent developments in the availability of macroeconomic panel data allow us to test our findings against alternative explanations, most notably the roles of various political indicators, in explaining corruption levels.

3. METHODOLOGY

(a) OLS and two-way fixed effects

We start by estimating the relationship between a country's regime type and its corruption level using a panel data set beginning in 1998, which is when broad international data for corruption became available, until 2012. For country i (with $1 \leq i \leq 155$ countries) in year t (with $1998 \leq t \leq 2012$), our basic specification takes the following form:

$$CPI_{it} = \alpha_0 + \alpha_1 Pol_{it} + \alpha_2 Lngdp_{it} + \alpha_3 Pol_{it} \times Lngdp_{it} + \alpha_4 X_{it} + \alpha_5 C_i + \alpha_6 Z_t + \delta_{it}. \quad (8)$$

We choose the Corruption Perceptions Index (CPI , ranging from zero to ten) as our dependent variable, where higher values indicate less corrupt governments, i.e., more freedom from corruption. The variable Pol_{it} measures the political regime type, ranging from completely autocratic to completely democratic. $Lngdp_{it}$ represents the logarithm of GDP per capita, the most persistent determinant of corruption levels in the associated literature. The sources of and relationships between all variables are described in detail in Section 4. The main innovation of our analysis is the interaction term between the political regime type of a country and its income level ($Pol_{it} \times Lngdp_{it}$).⁴

X_{it} incorporates additional control variables that have been found to be relevant in determining corruption levels, such as freedom of the press ($Freepress$), history of democracy in subsequent years ($Lndurable$), imports ($Lnimports$), government size (Gov), population size ($Lnpop$), urbanization rate ($Urbanrate$), and education levels (Edu , the duration of primary education, a proxy for education). This list follows the most comprehensive empirical studies on the time-varying determinants of corruption levels (Dincer, 2008; Dreher, Kotsogiannis, & McCorriston, 2009; Fisman & Gatti, 2002; Paldam, 2002; and Treisman, 2000). Following these studies and facilitating the interpretation of the derived relationships, we take the natural logarithm of the number of consecutive years of democracy [$Ln(1 + durable)$] to avoid losing observa-

tions for non-democratic countries], GDP per capita, imports, and population size, as denoted by Ln before the variable name.

C_i introduces country fixed effects, controlling for any country-specific heterogeneity in time-invariant factors, such as colonial origin, federal structure, common law system, or geographical components (e.g., degree of latitude). Given the 15-year time span of our data, country dummies also reasonably control for variables that only change slowly over time, such as the ethnic and religious distributions (e.g., fraction of Protestants) or inequality in a society. Incorporating country fixed effects in macroeconomic models has proven crucial, as a variety of popular results may change compared to a simple cross-country framework. Notable examples can be found in the literatures on growth (Islam, 1995) and government size determinants (Ram, 2009). In the context of corruption, an aggravating factor remains the open-endedness of potential determinants, as no comprehensive theoretical framework exists to date that is capable of explaining *all* factors influencing corruption levels. Thus, controlling for two-way fixed effects assures that unobservables that do not change within a country over time are not confounding the results of our analysis.

For similar reasons, we also include time fixed effects (Z_t), controlling for any common worldwide phenomena, such as the global financial crisis of 2007–08. In summary, our empirical analysis is able to control for any other potential determinants of corruption that have been highlighted by previous macroeconomic-level research. In addition, given the importance of the general institutional framework in this context, Section 7 discusses various robustness checks of our findings. Finally, δ_{it} corresponds to the usual error term.

(b) Controlling for the endogeneity of income levels

A problem of most conventional analyses of the determinants of corruption lies in the implicit endogeneity of income levels. Throughout the literature, GDP per capita stars as the most persistent corruption predictor, as richer countries tend to exhibit less corruption. However, although recent evidence points toward stronger causality running from income levels to corruption (Gundlach & Paldam, 2009), causality remains difficult to assess. Corruption may also influence income levels, as famously shown by Mauro (1995). Thus, simultaneity, especially with respect to income levels, may plague a conventional regression framework. To cope with this issue, we also estimate corruption in a three-stage-least-squares (3SLS) setting, simultaneously determining income and corruption levels. To further address potential endogeneity we use lagged values of the control variables, which has been shown to be a useful methodology for addressing endogeneity problems in related bodies of literature (e.g., see Temple, 1999, for the growth literature).⁵ Specifically, we re-estimate corruption as

$$CPI_{it} = \beta_0 + \beta_1 CPI_{i,t-1} + \beta_2 Pol_{it} + \beta_3 Lngdp_{it} + \beta_4 Pol_{it} \times Lngdp_{it} + \beta_4 X_{i,t-1} + \beta_5 C_i + \beta_6 Z_t + \epsilon_{it} \quad (9)$$

and simultaneously estimate income levels as

$$Lngdp_{it} = \gamma_1 + \gamma_2 Lngdp_{i,t-1} + \gamma_3 Pol_{it} + \gamma_4 W_{i,t-1} + \gamma_5 C_i + \gamma_6 Z_t + \zeta_{it} \quad (10)$$

Beyond the lagged value of income levels and the main variable of interest, Pol_{it} , Eqn. (10) also controls for the most persistent predictors of income in the literature, following Levine and Renelt (1992) and, more recently, Mirestean and Tsangarides (2009). This means that $W_{i,t-1}$ contains popula-

tion growth, life expectancy, inflation rates, investment, trade openness, government size, and education levels. All variables and their sources are explained in Table 10.

Ideally, we would like to have instrumental variables for either equation—one variable that uniquely identifies corruption and another solely predicting income levels. This task is difficult in a pure cross-country setting, yet it becomes substantially more complicated in a panel setting.⁶ Thus, we choose lagged values of the respective dependent variable as the main identifiers because past values of income and corruption are strongly correlated with their current values.

Overall, Eqns. (9) and (10) are identified by unique variables. For the corruption regression, these are $CPI_{i,t-1}$, the interaction term between the degree of democracy and GDP per capita ($Pol_{it} \times Lngdp_{it}$), population size, and urbanization rate. For the income regression, these are $Lngdp_{i,t-1}$, population growth, inflation, investment, and trade openness (all lagged). *F*-Tests for the joint insignificance of the unique dependent variables are provided for all respective regressions, and they firmly support our choices. Finally, the seemingly unrelated regression equations (SUR) model accounts for potential correlation of the error terms, extending the common 2SLS to a 3SLS system. This extension ensures that we control for any potentially omitted variables that may influence both corruption and income levels and therefore bias our coefficients.

(c) Quantile analysis

In addition to accounting for the endogeneity of income levels, we also want to test whether the derived results are specific to certain corruption levels. For instance, it may be that the findings are driven by some highly corrupt countries. In this case, a pure OLS or 3SLS framework merely returns coefficients at the mean of the distribution. One way to check for such heterogeneity is provided by a quantile regression framework.

Previously, Billger and Goel (2009) have incorporated quantile analysis into the corruption literature, investigating whether previous corruption levels are indicative of contemporary degrees of corruption. We follow Harding and Lamarche (2009) and Canay (2011) in estimating quantile regressions in a panel data setting. This recently developed technique provides two advantages: first, it allows us to take into account unobserved heterogeneity and heterogeneous covariate effects, and second, it allows us to acknowledge individual- and time-specific effects. In particular, we follow the approach developed by Canay (2011), where the incidental variable problem (fixed effects) can be eliminated in this setting through a simple transformation. This two-stage estimator is consistent and asymptotically normal with standard errors computed using a bootstrap methodology.

4. DATA

All our data are derived from common sources of international macroeconomic data, as displayed in Table 10. Overall, our main sample includes 155 countries, yet the sample is unbalanced, which means that not all countries have all yearly observations during 1998–2012. Table 11 shows all countries included in our sample with their respective number of observations. Our measure of corruption comes from Transparency International (the Corruption Perceptions Index, *CPI*), the most frequently used source for corruption studies. The index ranges from zero to ten, where higher values indicate less

corruption, i.e., more freedom from corruption. Compared to other corruption indices, the *CPI* is composed of both citizen perceptions and expert analyses, mostly conducted to assess the risk level of doing business in a country.⁷ As noted by Serra (2006, page 5) and detailed by Knack and Azfar (2000), the interests of risk analysts can differ from individual assessments of corruption in a country. Thus, combining both sources can lead to a more reliable measurement of corruption levels. Of course, the usual skepticism about the precision of corruption indices remains: as with all illegal activities, it is difficult to gather exact data. In this context, the use of two-way fixed effects can further alleviate doubts about the comparability of *CPI* scores across countries and time, as it controls for measurement errors that are consistent within countries and years.

Our main explanatory variable, the regime type of a country, is derived from the Polity IV project. Specifically, we use the variable *Polity2*, which ranges from -10 (total autocracy) to $+10$ (perfect democracy). Several previous works have used the Polity IV data set in this context, most prominently Swamy, Knack, Lee, and Azfar (2001) and Gatti (2004). To facilitate comparability, we re-scale the index to range from zero to 20 (labeled *Pol*). Figure 1 provides a basic comparison between the observed values of the *CPI* and *Pol* for both the first year of our sample (1998) and the final year (2012). We also display the *LOWESS* curve between both variables (locally weighted regression), allowing us to assess the basic descriptive relationship between regime type and corruption without requiring any advanced specification of the functional form (Jacoby, 2000).

This simple scatterplot already provides an intuition as to why the link between democracy and corruption has been so hard to detect in the past: when broad data on corruption first became available in 1998, the relationship appeared positive, but the main reason seems to be data availability (81 countries *versus* 159 in 2012).⁸ The picture in 2012 is quite different; we see that countries caught in between autocracy and democracy tend to exhibit higher levels of corruption, i.e., less freedom from corruption. This phenomenon is in line with previous findings, for example, Rock (2009). Although these basic graphs are purely descriptive, they indicate an intimate relationship between democracy and corruption.

Because the Polity index only captures de jure political power, i.e., offices filled through elections, we also incorporate a variable measuring the possibilities of civil participation (a proxy for de facto political power), namely, media freedom.⁹

Several papers indicate that freedom of the press can have a beneficial effect in combating corruption (e.g., Brunetti & Weder, 2003, or Chowdhury, 2004), as an independent press may be more likely to uncover and publish corrupt behavior. We access the Freedom House website and incorporate the variable press freedom into our analysis, which ranges from zero (no press freedom) to 100 (total freedom of the press). Figure 2 plots the *CPI* and *Freepress* for the years 1998 and 2012. Once again, we note that there are substantially more observations available in 2012 (172 *versus* 82). However, the relationship seems positive in both 1998 and 2012, and we do not observe a U-shape, as Figure 1 indicates. For both years, it seems that liberty of the press is associated with freedom from corruption.

We obtain a measure of the number of consecutive years of democracy, another relevant aspect of a political regime, from the Polity IV project. Cultural traits have been shown to persist over long periods, such as the role of women in society (Alesina, Giuliano, & Nunn, 2013) or solidarity behavior within societies (see Brosig-Koch, Helbach, Ockenfels, & Weimann, 2011). In the context of democratic structures, Treisman (2000) and Serra (2006) find that a longer history of democracy reduces corruption in a cross-country analysis. Fisman and Miguel (2007) use a measure of diplomat parking tickets and a regulatory change in legal enforcement as a natural experiment to show that traditional cultural norms are important determinants of corruption.

Regarding the conventional control variables (indicated by X_{it} in Eqn. (8)), we access the World Development Indicators (published by the World Bank) to obtain data for GDP per capita (in 2005 US\$), imports and government size (both as a percentage of GDP), duration of primary education in years, population size, and urbanization rate. Although all of these variables appear in a variety of studies analyzing corruption determinants, the most consistent finding is related to income levels.¹⁰ Figure 3 plots income levels against the *CPI* (top) and Polity index (bottom) for the years 1998 and 2012. The link between freedom from corruption and income does appear to be firmly positive. The connection between income and a country's regime type, however, seems less clear. The *LOWESS* curves describe a weak quadratic relationship in the bottom graphs of Figure 3, but we can observe numerous outliers in both years.

Overall, these graphs must be interpreted with care, as they are purely descriptive. To provide a deeper picture of the sample data, Table 12 displays the correlation coefficients between the major variables used in our analysis.

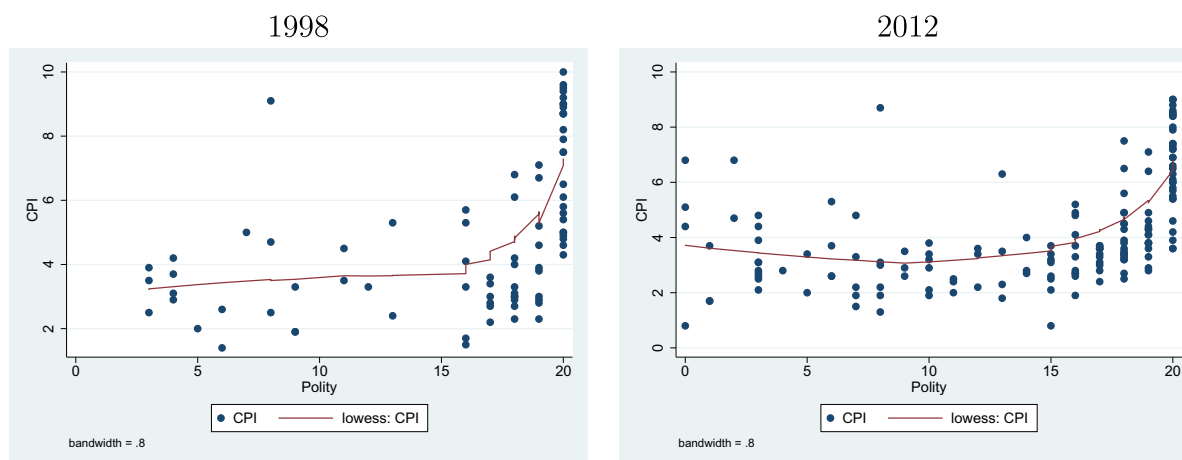
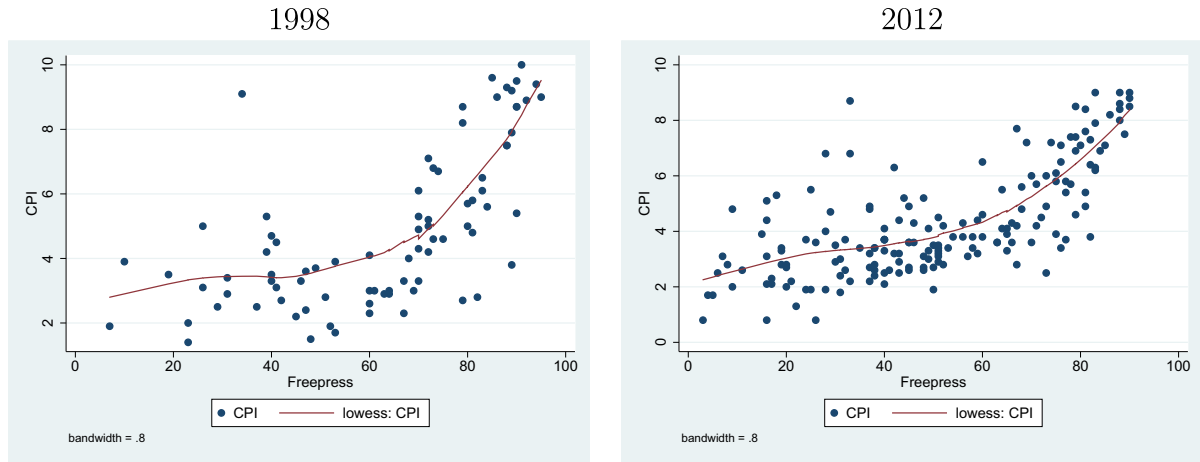
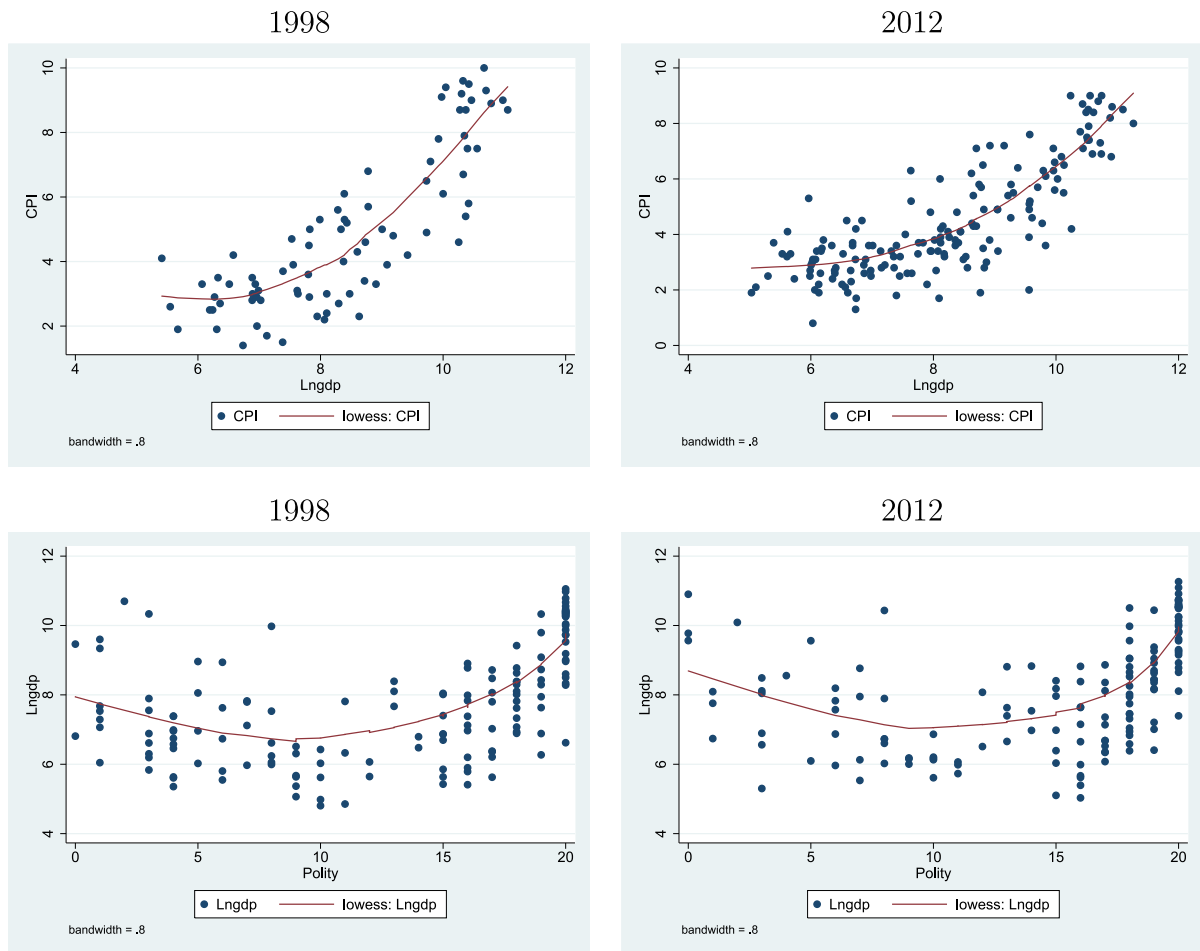


Figure 1. Corruption levels (y-axis) and regime form (x-axis) across countries

Figure 2. *Corruption levels (y-axis) and press freedom (x-axis) across countries*Figure 3. *Top: The relationship between income and corruption. Bottom: The relationship between regime form and income.*

After presenting our main results, Section 7 then considers a variety of alternative specifications. We focus on additional institutional characteristics that may be closely related to corruption and may potentially mitigate the relationship between democracy and corruption. To ensure that our main result (the mediating effect of income levels in explaining the democracy-corruption link) is not spurious, the analysis considers several additional aspects related to political institu-

tions, such as political rights, civil liberties, rule of law, and regulatory quality.¹¹ Beyond that, we test whether our results can be explained by the degree of informality in society (measured by the extent of the shadow economy) or the degree of social capital (measured as trust in other people).

The following regression analysis focuses on the non-trivial relationship between regime type and corruption, introducing the crucial role of income levels.

Table 2. Results from pooled OLS regressions, estimating the freedom from corruption (CPI)

	(1)	(2)	(3)	(4)	(5)	(6)
<i>Dependent variable: CPI (sample mean = 4.24)</i>						
<i>Pol</i>	0.148*** (0.007)	0.031*** (0.005)	−0.326*** (0.024)	−0.321*** (0.023)	−0.336*** (0.023)	−0.329*** (0.022)
<i>Lngdp</i>		1.045*** (0.036)	0.308*** (0.066)	0.295*** (0.059)	0.280*** (0.064)	0.273*** (0.058)
<i>Lnimp</i>		0.352*** (0.079)	0.416*** (0.082)	0.465*** (0.083)	0.496*** (0.083)	0.527*** (0.084)
<i>Gov</i>		0.027*** (0.007)	0.022*** (0.005)	0.018*** (0.005)	0.020*** (0.005)	0.016*** (0.005)
<i>Edu</i>		0.446*** (0.024)	0.441*** (0.023)	0.367*** (0.024)	0.421*** (0.024)	0.355*** (0.024)
<i>Lnpop</i>		0.048** (0.023)	0.012 (0.022)	0.046** (0.021)	0.014 (0.021)	0.046** (0.021)
<i>Urbanrate</i>		−0.001 (0.003)	0.007*** (0.003)	0.009*** (0.002)	0.008*** (0.003)	0.009*** (0.002)
<i>Pol × Lngdp</i>			0.044*** (0.003)	0.034*** (0.003)	0.039*** (0.003)	0.031*** (0.003)
<i>Freepress</i>				0.029*** (0.002)		0.027*** (0.002)
<i>Lnendurable</i>					0.241*** (0.030)	0.196*** (0.028)
Threshold (2005 US\$)			1,650	12,581	5,513	40,666
# of countries	155	155	155	155	155	155
<i>N</i>	1,806	1,806	1,806	1,806	1,806	1,806
<i>R</i> ²	0.173	0.726	0.756	0.775	0.764	0.780

Robust standard errors in parentheses.

* $p < 0.10$.

** $p < 0.05$.

*** $p < 0.01$.

5. ANALYZING THE DATA AS A POOLED SAMPLE

We start by estimating Eqn. (8) using the data as a pooled sample of annual observations with the results displayed in Table 2. In total, we consider 1,806 observations for which all required variables are available. The univariate format of column (1) confirms the intuition derived from Figure 1: democratic countries seem to be characterized by more freedom from corruption. A literal interpretation of this regression would mean that a one-unit increase in the Polity index toward democracy (measured from zero to 20) is associated with a 0.15 point increase in the CPI (measured from zero to ten). However, incorporating common control variables from the corruption literature in column (2) decreases the magnitude of this finding to a coefficient of 0.03. In addition, the explanatory power of regression (2) is raised substantially, increasing the R^2 from 0.17 to 0.73. Thus, these variables are able to account for as much as 73% of the variation in corruption levels from year to year—even without accounting for country- or time-specific unobservables.

Column (3) then includes the interaction term between *Pol* and income levels, suggesting that the effect of democracy on corruption may vary across income levels. Note that the pure effect of democratization is now negative, but it becomes positive for income levels over $Lngdp \cong 7.41$, which corresponds to approximately US\$1,650 in 2005 US\$.¹² For convenience, the respective threshold levels are displayed below the regression estimates. Columns (4) to (6) then add two important political factors to the list of explanatory variables: freedom of the press (*Freepress*) and the logarithm of the number of consecutive years the country experienced democracy until year t . Note that significance levels for both *Pol* and

Pol × Lngdp remain unaffected, yet the magnitude of the suggested effects changes. In fact, the proposed threshold level for a positive effect of democracy on corruption fluctuates substantially (up to US\$40,666), depending on which variables are included in the control set. In terms of the remaining control variables, we confirm previous findings: income levels, imports, government size, education, population size, urbanization, press freedom, and a history of democracy all seem to be related to less corruption. The following tables will mostly indicate whether these control variables are included, but the individual coefficients are omitted (available upon request). In general, the main results from Table 2 are confirmed throughout our analysis for these covariates.

From analyzing yearly observations, we now move to a pure cross-sectional analysis, using one observation per country. The time horizon of the sample data can be important if we want to focus on short- versus long-run effects. Table 2 and the majority of our following analysis focus on annual observations, but we also wish to test the link between democracy and corruption in a long-term context of up to 15 years, given data availability. To derive one observation per country, we use the average value during 1998–2012 for each variable and country. Notice that this analysis faces a tradeoff in terms of precision and data availability. Because we are incorporating up to nine explanatory variables, we naturally witness gaps in the data, i.e., not all variables are available for all 15 years for all countries.

Table 3 displays the results from taking pure averages, which creates the largest possible country sample (155).¹³ As before, we are moving from a univariate regression toward including more control variables and adding the interaction term between *Pol* and income levels in column (3). The results

Table 3. *Pure cross-sectional analysis of one observation per country (all variables are averaged from 1998 to 2012 using the most observations available)*

	(1)	(2)	(3)	(4)	(5)	(6)
<i>Dependent variable: CPI (sample mean = 4.24)</i>						
<i>Pol</i>	0.136*** (0.026)	0.040*** (0.014)	-0.310*** (0.080)	-0.341*** (0.076)	-0.337*** (0.077)	-0.361*** (0.075)
<i>Lngdp</i>		0.955*** (0.116)	0.292 (0.198)	0.208 (0.181)	0.222 (0.193)	0.153 (0.180)
<i>Pol × Lngdp</i>			0.042*** (0.010)	0.037*** (0.009)	0.039*** (0.010)	0.034*** (0.009)
<i>Freepress</i>				0.029*** (0.008)		0.027*** (0.008)
<i>Lndurable</i>					0.310*** (0.116)	0.268*** (0.113)
Control variables ^a		Yes	Yes	Yes	Yes	Yes
Threshold (2005 US\$)			1,604	10,059	5,659	40,849
<i>N</i> (# of countries)	155	155	155	155	155	155
<i>R</i> ²	0.170	0.724	0.759	0.777	0.769	0.785

Robust standard errors in parentheses.

* $p < 0.10$.^a Includes *Lnimp*, *Gov*, *Edu*, *Lnpop*, and *Urbanrate*.** $p < 0.05$ *** $p < 0.01$.

closely mimic the previous findings: in poorer nations, democratic structures promote corruption. Only in richer nations do we find a positive effect from democratization on the freedom from corruption index. Notice that the respective threshold values of income are almost identical to the values derived in Table 2. Thus, the mitigating role of income levels in the relationship between democracy and corruption also seems to hold over the long run, at least for the 15-year period from 1998 to 2012. However, as in the pooled OLS regressions from Table 2, the derived threshold level varies substantially, suggesting strong sensitivity to the model specification. As a next

step, the following section incorporates fixed effects into the analysis.

6. INCORPORATING COUNTRY AND TIME FIXED EFFECTS

Table 4 replicates the same sequence of regressions from Tables 2 and 3, accounting for country-specific heterogeneity (all columns) and time fixed effects (column 7). We also display the results of Hausman tests below each regression, confirming

Table 4. *Results from incorporating country- and time-specific effects, estimating freedom from corruption (CPI)*

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<i>Dependent variable: CPI (sample mean = 4.24)</i>							
<i>Pol</i>	0.001 (0.010)	-0.006 (0.010)	-0.205*** (0.070)	-0.196*** (0.068)	-0.198*** (0.069)	-0.191*** (0.067)	-0.227*** (0.073)
<i>Lngdp</i>		0.495** (0.202)	0.170 (0.240)	0.241 (0.226)	0.175 (0.239)	0.242 (0.226)	0.505** (0.227)
<i>Pol × Lngdp</i>			0.029*** (0.010)	0.025** (0.010)	0.027*** (0.010)	0.024** (0.010)	0.030*** (0.011)
<i>Freepress</i>				0.011*** (0.003)		0.011*** (0.003)	0.008** (0.004)
<i>Lndurable</i>					0.035 (0.041)	0.022 (0.037)	0.043 (0.037)
Control variables ^a		Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE							Yes
Threshold (2005 US\$)			1,175	2,540	1,530	2,859	1,933
Hausman test ^b	0.00***	0.00***	0.00***	0.00***	0.00***	0.00***	0.01***
# of countries	155	155	155	155	155	155	155
<i>N</i>	1,806	1,806	1,806	1,806	1,806	1,806	1,806

Robust standard errors in parentheses.

* $p < 0.10$.^a Includes *Lnimp*, *Gov*, *Edu*, *Lnpop*, and *Urbanrate*.^b Testing for fixed versus random effects.** $p < 0.05$.*** $p < 0.01$.

the relevance of fixed effects over random effects. Starting with the main variable of interest, Table 4 produces telling results. In fact, without the interaction term in columns (1) and (2), the regime type is suggested to have no impact on corruption at all. Were we to stop here, the conclusion would be that democracy has no impact on corruption, once country- and time-specific unobservables are accounted for. However, the introduction of $Pol \times Lngdp$ in column (3) recovers our previous result, and income plays a crucial mediating role in the link between democracy and corruption. This result is then stable to not only inclusion of press freedom and history of democracy but also the introduction of time fixed effects in column (7). Notice that the threshold level is now substantially more consistent throughout different estimations, ranging from US\$1,175 to US\$2,859.

In the final and most complete specification, we find that countries with a GDP per capita level higher than approximately US\$2,000 are suggested to benefit from democracy, reducing corruption levels. This beneficial effect further increases with income. This threshold level of income corresponds to countries such as the Republic of the Congo, Georgia, and recently, Ukraine, which had income levels between US\$1,120 and US\$1,450 from 1994 to 2002, even though Pol increased from 15 to 17 during that timeframe. Consistent with our explanation, the country experienced a decrease in its CPI score (i.e., more corruption) throughout that timeframe from 2.8 (in 1998, the first available year) to as low as 1.5 in 2000. Corruption was strongly prevalent to begin with but then worsened. For the richest countries in our sample (Luxembourg in 2012 with a GDP per capita of US\$77,899), a theoretical increase of the Polity score of 5 points should decrease corruption by 0.55 points, implying an elasticity of approximately 0.1. Put differently, a one standard deviation of the Polity score (6.2) is suggested to increase the freedom from corruption score by 0.69 points for the richest countries. For the poorest countries, such as Burundi or Malawi, a one standard deviation of $Polity$ would imply a decrease in the CPI score (and therefore a worsening of corruption) of 0.08 points.

Regarding the remaining political variables related to a country's political environment, we find interesting differences from the results derived in Table 2. Including fixed effects now renders the coefficient on $Lndurable$ firmly insignificant at conventional levels. Press freedom, however, remains strongly associated with corruption levels, although the magnitude is substantially decreased.

Notice that we could also consider the interaction term between Pol and $Lngdp$ from the opposite point of view: increasing income alleviates corruption in general (the coefficient on $Lngdp$), but this effect is even stronger in democracies. In fact, countries with a Pol score of approximately 17 (out of a maximum of 20) enjoy twice the income effect on corruption compared to a pure autocracy ($Pol = 0$).¹⁴ Thus, the positive connection between income and corruption in Bolivia or Senegal ($Pol = 17$ for both in 2012) should be twice as strong as in Saudi Arabia or Qatar ($Pol = 0$ for both in 2012).

Using our preferred and most complete specification in column (7), Figure 4 displays the Pol and $Lngdp$ scores for all our sample countries. The straight line shows the threshold level for $Lngdp$, and green (red) circles represent Pol values higher (lower) than 10 out of a maximum of 20. Some interesting differences emerge when comparing our sample countries in 1998 and 2012. First, we find that quite a few countries today would profit from shifting to more democratic structures, such as Kazakhstan (KAZ), the United Arab Emirates (ARE), or even

Singapore (SGP), which is a country with a relatively low level of corruption (CPI in 2012 = 8.7). Second, there still remains a long list of countries that are suggested to incur higher corruption levels when moving up the Pol ladder. On this list, we find countries that face high rates of corruption and have previously experience severe instability, such as Zimbabwe, but also some former Soviet Union members, such as Moldova and Kyrgyzstan ($Pol > 15$, $CPI < 4$, and $Lngdp < 7.56$). In fact, Iwasaki and Suzuki (2012) have noted the high corruption levels registered by transition economies, recognizing that corruption can worsen in the disorder following the collapse of a socialist planning system. Our results generalize this finding, suggesting income levels as a crucial mitigating variable.

Figure 5 then shows the predictions of our results on a world map in 1998 and 2012. Several countries have moved from a suggested negative effect of democratization on corruption (red countries) to a positive one since 1998 (blue). Notable examples are China, Morocco, and Ukraine. However, there are also numerous countries that are still suggested to suffer from more corruption when transitioning to democracy, which signals that the heterogeneous effect of democracy on corruption is not merely a concern of the 20th century.

7. ROBUSTNESS CHECKS

(a) Additional control variables and other nonlinearities

Departing from these main findings, we now evaluate whether other common corruption determinants are also mitigated by income levels. In fact, there is no reason to assume a priori that only the effect of democracy on corruption changes with GDP per capita. Table 5 considers a variety of these specifications, departing from the baseline regression displayed in column (7) of Table 4.

First, column (1) follows Sung (2004) and Rock (2009) in suggesting a pure non-linearity for democracy. As countries start to democratize their political systems, corruption may increase, but in the final stages toward becoming a full democracy, this effect might be reversed. This argument corresponds to the analytical model provided by Mohtadi and Roe (2003), who suggest an inverted-U effect of democratization on rent seeking. In fact, Figure 1 may lead one to believe that this is accurate, especially considering the plotted data for 2012. We find no indication of pure nonlinearity, yet the mitigating role of income levels remains significant and economically meaningful.

Column (2) considers a balanced sample, where only countries with observations for CPI , Pol , and $Lngdp$ for all years during 2000–12 are included. This robustness check helps to ensure that outliers with only few observations are not confounding our results. The general result remains intact, yet significance levels are decreased. Heightened standard errors are mostly responsible here, potentially owing to the reduced sample size (nearly 50% of observations are lost).

Columns (3) to (5) then evaluate whether other conventional corruption determinants are also mitigated by GDP per capita by incorporating interaction terms for press freedom, education, and government spending with income levels. However, none of these additional variables produces statistically significant coefficients or changes the interpretation of our main result. In terms of magnitudes, we only observe marginal changes in Pol and $Pol \times Lngdp$. Thus, the influence of development levels appears to be unique to the effect of democracy

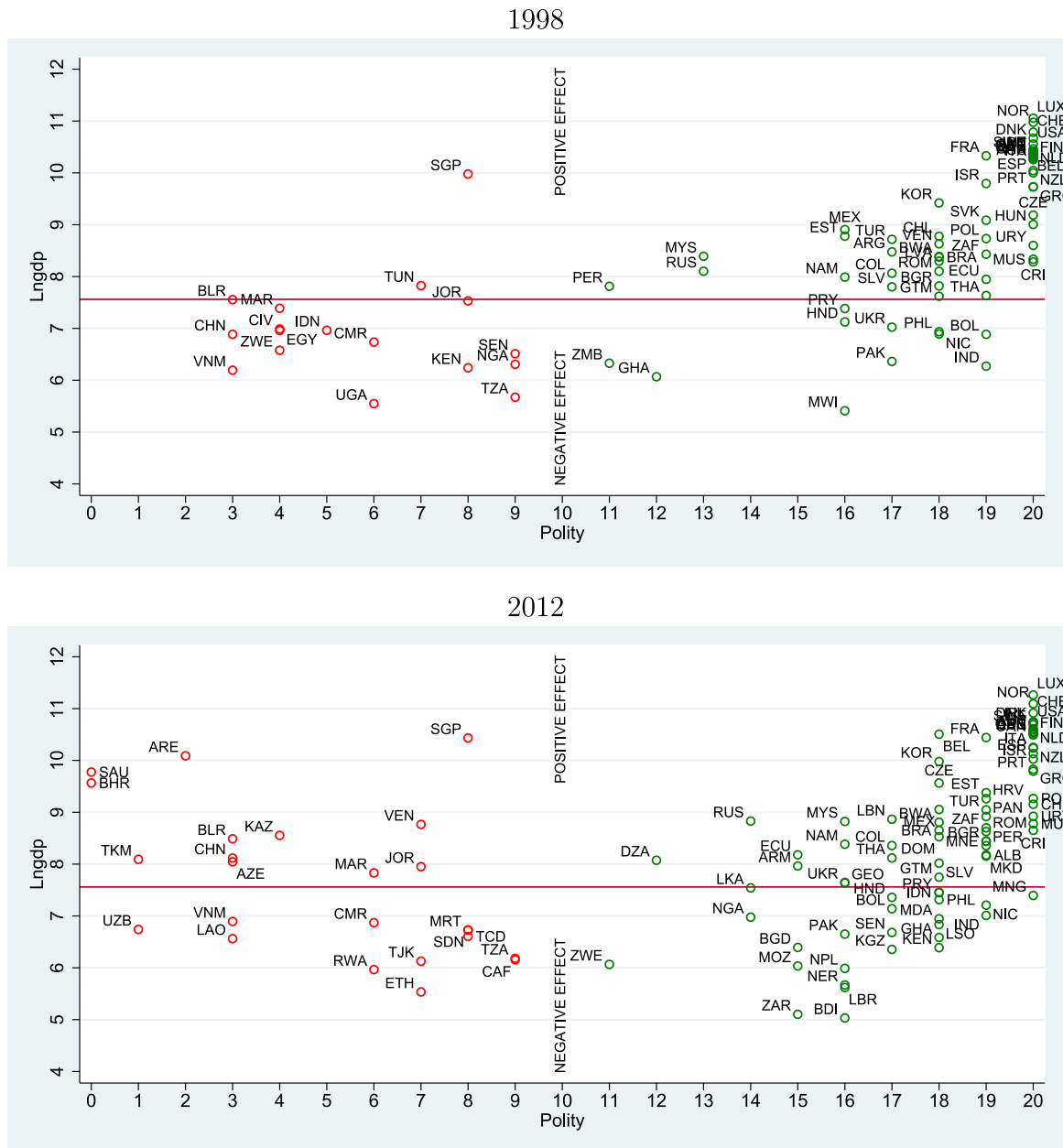


Figure 4. Levels of *Pol* and *LnGdp* for all sample countries available in 1998 (top) and 2012 (bottom). The red line displays the threshold level: above (below) the line, the effect of democratization on corruption is suggested to be positive (negative). (For interpretation of the references to color in this figure legend, the reader is referred to the web version of this article.)

on corruption when turning to conventional corruption determinants. We also experimented with interaction terms of the remaining control variables with income levels and *Pol*, yet none of these specifications change our main result.

However, as initially suggested by Huntington (1968, first version), the surrounding political institutions may be the crucial ingredient when evaluating the effects of democracy on corruption. Thus, our results may be spurious, as income levels may simply reflect other institutional factors that happen to be correlated with income levels.¹⁵ As a first approach, column (6) of Table 5 incorporates government effectiveness in the analysis. However, we find no evidence for this theory, as both *Goveff* and its interaction term with *Pol* remain insignif-

icant at conventional levels. In addition, the coefficient on the interaction term between *Pol* and income levels remains virtually unchanged.

Tables 6 and 7 address a variety of institutional characteristics in this context (see Table 10 for summary statistics and data sources). Specifically, we first include a potential corruption determinant. Then, we test for a possible interaction with the Polity index. If our result regarding the mitigating role of income levels was spurious, then the coefficient associated with the interaction between Polity and income levels would lose its statistical relevance. In particular, Table 6 incorporates political rights, civil liberties, another measure of regulatory quality, prevalence of the rule of law, and degree of political

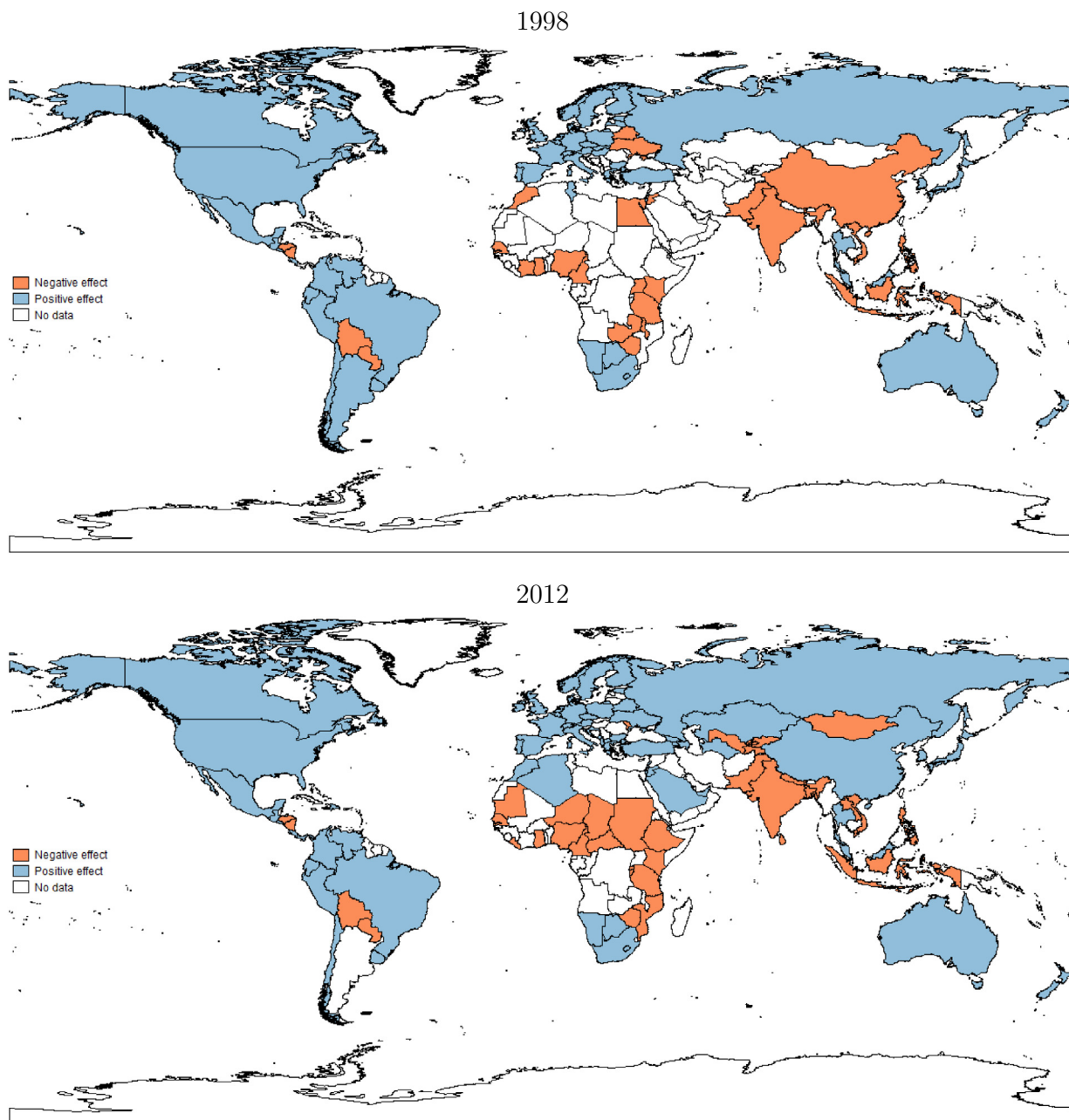


Figure 5. Marginal effect of *Pol* on CPI for all sample countries available in 1998 (top) and 2012 (bottom). The red (blue) color displays the countries which are below (above) of the threshold level. (For interpretation of the references to color in this figure legend, the reader is referred to the web version of this article.)

constraints into the analysis.¹⁶ Note that the interaction term between income levels and *Pol* remains statistically meaningful, with a magnitude ranging from 0.016 to 0.028.

Further, Table 7 includes additional indicators of political institutions, specifically the independence of the judiciary and the functioning of government. Beyond these institutional variables, we incorporate the extent of the shadow economy and two measurements indicating the degree of trust in society. Throughout all of these estimations, the mitigating role of income prevails. Only when including the degree of the shadow economy (columns 3 and 4) do we see a sizeable drop in the coefficient related to $Pol \times Lngdp$. However, note that we

lose nearly 45% of our main observations (1,005 instead of 1,806 observations), and this lower coefficient might be due to the observations that are excluded. Indeed, we find that re-estimating the baseline regression using only the observations for which the level of shadow economy is available returns a similarly low coefficient (0.013). Thus, the degree of the shadow economy does not drive the mediating role of income levels.

Overall, it appears unlikely that institutional characteristics are driving the importance of income levels in mitigating the effect of democracy on corruption levels. Although we cannot completely exclude this possibility, of course, our additional

Table 5. *Robustness checks and interaction terms of other control variables*

	(1)	(2)	(3)	(4)	(5)	(6)
<i>Dependent variable: CPI (sample mean = 4.24)</i>						
<i>Pol</i>	-0.191** (0.090)	-0.213* (0.117)	-0.211*** (0.076)	-0.225*** (0.072)	-0.226*** (0.073)	-0.252*** (0.074)
<i>Lngdp</i>	0.499** (0.227)	0.965*** (0.269)	0.476* (0.245)	0.388 (0.362)	0.483** (0.231)	0.486** (0.226)
<i>Pol</i> × <i>Lngdp</i>	0.032*** (0.010)	0.027* (0.016)	0.028** (0.011)	0.030*** (0.011)	0.030*** (0.011)	0.032*** (0.011)
<i>Pol</i> ²	-0.002 (0.002)					
<i>Freepress</i> × <i>Lngdp</i>			0.001 (0.003)			
<i>Edu</i> × <i>Lngdp</i>				0.026 (0.056)		
<i>Gov</i> × <i>Lngdp</i>					0.003 (0.006)	
<i>Goveff</i>						0.258 (0.196)
<i>Goveff</i> × <i>Pol</i>						-0.016 (0.012)
Control variables ^a	Yes	Yes	Yes	Yes	Yes	Yes
Country & time FE	Yes	Yes	Yes	Yes	Yes	Yes
Balanced sample		Yes				
# of countries	155	76	155	155	155	153
<i>N</i>	1,806	976	1,806	1,806	1,806	1,794

Robust standard errors in parentheses.

^a Includes *Lnimp*, *Gov*, *Edu*, *Lnpop*, *Urbanrate*, *Freepress*, and *Lndurable*.* $p < 0.10$.** $p < 0.05$.*** $p < 0.01$.Table 6. *Robustness checks including the role of institutions*

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
<i>Dependent variable: CPI (sample mean = 4.24)</i>										
<i>Pol</i>	-0.203*** (0.045)	-0.335*** (0.053)	-0.192*** (0.045)	-0.206*** (0.055)	-0.181*** (0.048)	-0.191*** (0.053)	-0.201*** (0.048)	-0.205*** (0.053)	-0.125** (0.057)	-0.127** (0.057)
<i>Lngdp</i>	0.347** (0.136)	0.310** (0.135)	0.301** (0.136)	0.293** (0.137)	-0.064 (0.154)	-0.085 (0.161)	-0.046 (0.152)	-0.053 (0.156)	0.411** (0.178)	0.402** (0.179)
<i>Pol</i> × <i>Lngdp</i>	0.023*** (0.007)	0.028*** (0.007)	0.024*** (0.007)	0.024*** (0.007)	0.024*** (0.007)	0.025*** (0.008)	0.026*** (0.007)	0.026*** (0.007)	0.016** (0.008)	0.017** (0.008)
Additional control	Political rights	Political rights	Civil liberties	Civil liberties	Regulatory quality	Regulatory quality	Rule of law	Rule of law	Political constraints	Political constraints
Interaction term with <i>Pol</i> ^b		Yes		Yes		Yes		Yes		Yes
Control variables ^a	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country & time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
# of countries	153	153	153	153	153	153	153	153	152	152
<i>N</i>	1,402	1,402	1,402	1,402	1,223	1,223	1,223	1,223	1,116	1,116

Robust standard errors in parentheses.

* $p < 0.10$.^a Includes *Lnimp*, *Gov*, *Edu*, *Lnpop*, *Urbanrate*, and *Lndurable*.^b Includes interaction term between the respective additional control and *Pol*.** $p < 0.05$.*** $p < 0.01$.

estimations strengthen the robustness of our findings. We also want to highlight that, even though some institutional variables produce statistically meaningful coefficients by themselves, none of these are able to explain the change in

direction from a negative net effect to a positive net effect of *Pol* on corruption. This finding is unique to income levels and therefore explains why we sometimes observe that democracy increases corruption (in poor countries) and

Table 7. Additional robustness checks including the role of institutions, the shadow economy, and interpersonal trust in society

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Dependent variable: CPI (sample mean = 4.24)										
<i>Pol</i>	-0.137** (0.056)	-0.145*** (0.056)	-0.107* (0.058)	-0.093 (0.061)	-0.205*** (0.076)	-0.227*** (0.076)	-0.469*** (0.138)	0.042 (0.375)	-0.469*** (0.138)	-0.459*** (0.124)
<i>Lngdp</i>	0.356** (0.176)	0.306* (0.178)	0.173 (0.227)	0.137 (0.233)	0.143 (0.297)	0.108 (0.296)	-0.175 (0.407)	0.078 (0.448)	-0.175 (0.407)	0.078 (0.448)
<i>Pol</i> × <i>Lngdp</i>	0.018** (0.008)	0.020** (0.008)	0.015* (0.008)	0.017* (0.009)	0.026** (0.011)	0.036*** (0.012)	0.055*** (0.019)	0.043** (0.021)	0.055*** (0.019)	0.043** (0.021)
Additional control	Independent judiciary	Independent judiciary	Shadow economy	Shadow economy	Functioning of government	Functioning of government	Most people can be trusted	Most people can be trusted	Interpersonal trust	Interpersonal trust
Interaction term with <i>Pol</i> ^b		Yes		Yes		Yes		Yes		Yes
Control variables ^a	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country & time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
# of countries	151	151	146	146	152	152	78	78	78	78
<i>N</i>	1,103	1,103	1,005	1,005	573	573	115	115	115	115

Robust standard errors in parentheses.

^a Includes *Lnimp*, *Gov*, *Edu*, *Lnpop*, *Urbanrate*, and *Lndurable*.^b Includes interaction term between the respective additional control and *Pol*.* $p < 0.10$.** $p < 0.05$.*** $p < 0.01$.

Table 8. 3SLS results, estimating corruption (CPI) and income levels (Lngdp) simultaneously

	(1)	(2)	(3)	(4)	(5)	(6)
3SLS Results for dependent variable: CPI_{it}						
$Polity_{it}$	-0.001 (0.007)	-0.006 (0.008)	-0.076** (0.036)	-0.073** (0.037)	-0.111*** (0.037)	-0.111*** (0.037)
$CPI_{i,t-1}$	0.965*** (0.006)	0.962*** (0.007)	0.659*** (0.018)	0.659*** (0.018)	0.651*** (0.018)	0.651*** (0.018)
$Lngdp_{it}$	0.029** (0.014)	0.010 (0.018)	0.112 (0.089)	0.114 (0.089)	0.328*** (0.098)	0.328*** (0.098)
$Pol_{it} \times Lngdp_{it}$	0.000 (0.001)	0.001 (0.001)	0.010** (0.005)	0.010* (0.005)	0.015*** (0.005)	0.015*** (0.005)
Control set 1		Yes	Yes	Yes	Yes	Yes
Country fixed effects			Yes		Yes	Yes
Time fixed effects				Yes	Yes	Yes
Linear & quadratic time trends						Yes
Threshold (2005 US\$)		403	1,998	1,480	1,636	1,636
<i>P</i> value of joint insignificance of IVs ¹	0.00***	0.00***	0.00***	0.00***	0.00***	0.00***
3SLS Results for dependent variable: $Lngdp_{it}$						
$Lngdp_{i,t-1}$	0.996*** (0.001)	0.992*** (0.001)	0.929*** (0.009)	0.929*** (0.009)	0.932*** (0.010)	0.932*** (0.010)
Pol_{it}		-0.001*** (0.000)	0.003* (0.002)	0.003* (0.002)	0.002 (0.001)	0.002 (0.001)
Control set 2		Yes	Yes	Yes	Yes	Yes
Country fixed effects			Yes		Yes	Yes
Time fixed effects				Yes	Yes	Yes
Linear & quadratic time trends						Yes
<i>P</i> value of joint insignificance of IVs ²	0.00***	0.00***	0.00***	0.00***	0.00***	0.00***
# of countries	147	147	147	147	147	147
<i>N</i>	1,442	1,442	1,442	1,442	1,442	1,442

Standard errors in parentheses. Control set 1: $LLnimp_{i,t-1}$, $Gov_{i,t-1}$, $Edu_{i,t-1}$, $Urbanrate_{i,t-1}$, $Lndurable_{i,t-1}$, and $Freepress_{i,t-1}$. Control set 2: $Popgrowth_{i,t-1}$, $Lifeexp_{i,t-1}$, $Inflation_{i,t-1}$, and $Investment_{i,t-1}$.¹ IVs are regressors exclusively used in the *CPI* equation: $CPI_{i,t-1}$, $Polity \times Lngdp_{i,t}$, $Lnimp_{i,t-1}$, $Lnpop_{i,t-1}$, $Urbanrate_{i,t-1}$, $Lndurable_{i,t-1}$, and $Freepress_{i,t-1}$.² IVs are regressors exclusively used in the *Lngdp* equation: $Lngdp_{i,t-1}$, $Popgrowth_{i,t-1}$, $Lifeexp_{i,t-1}$, $Inflation_{i,t-1}$, $Investment_{i,t-1}$, and $Lntrade_{i,t-1}$.* $p < 0.10$.** $p < 0.05$.*** $p < 0.01$.

Table 9. *Quantile regression results*

	(1) OLS	(2) Q 0.10	(3) Q 0.25	(4) Q 0.50	(5) Q 0.75	(6) Q 0.90
<i>Dependent variable: CPI (sample mean = 4.24)</i>						
<i>Pol</i>	-0.227*** (0.073)	-0.231*** (0.012)	-0.240*** (0.009)	-0.224*** (0.012)	-0.218*** (0.008)	-0.212*** (0.020)
<i>Lngdp</i>	0.505** (0.227)	0.457*** (0.033)	0.461*** (0.022)	0.517*** (0.033)	0.520*** (0.022)	0.550*** (0.043)
<i>Pol × Lngdp</i>	0.030*** (0.011)	0.030*** (0.002)	0.032*** (0.001)	0.030*** (0.002)	0.029*** (0.001)	0.028*** (0.002)
Control variables ^a	Yes	Yes	Yes	Yes	Yes	Yes
Country & time FE	Yes	Yes	Yes	Yes	Yes	Yes
# of countries	155	155	155	155	155	155
<i>N</i>	1,806	1,806	1,806	1,806	1,806	1,806

Robust standard errors in parentheses.

* $p < 0.10$.

^a Includes *Lnimp*, *Gov*, *Edu*, *Lnpop*, *Urbanrate*, *Freepress*, and *Lndurable*.

** $p < 0.05$

*** $p < 0.01$.

sometimes observe the opposite. In alternative estimations, we also removed the interaction term between income levels and the Polity index while incorporating the discussed interaction terms between the Polity index and other institutional characteristics. However, even then none of the institutional aspects is able to explain why democracy can sometimes decrease corruption and other times increase it. From here, we now move to another persistent problem in analyzing corruption determinants by addressing endogeneity concerns.

(b) Addressing the endogeneity of income levels

The corruption literature generally suffers from a latent endogeneity problem, which is similar to most macroeconomic studies. One problem is the “open-endedness” of potential factors, a problem that the inclusion of numerous control variables and two-way fixed effects in the previous sections addresses. Another issue stems from an inherent reverse causality problem because some variables may affect corruption, which are in turn affected by corruption. Most notably, we can see this pattern considering income levels. Richer countries may well be less corrupt, but corruption may also affect income, as famously argued by Mauro (1995), among others. Although Treisman (2007) and, more recently, Gundlach and Paldam (2009) suggest that causality runs from income toward corruption and not vice versa, we can not completely eliminate the possibility of reverse causality disturbing the interpretational power of basic linear regressions.

To cope with the simultaneity of income levels in Eqn. (8), we construct a 3SLS framework, where corruption and income levels are determined simultaneously (Table 8). To conserve space, we do not display the estimated coefficients of the control variables, yet the previous findings are generally confirmed throughout Table 8. First, estimating the system as a pooled sample in columns (1) and (2) produces insignificant results for both *Pol* and *Pol × Lngdp*, although they display the expected signs.

After including country fixed effects in columns (3) to (6), we recover the familiar results with negative coefficients on *Pol* and a positive coefficient on *Pol × Lngdp*. Notice that the magnitudes are decreased to approximately one-half of their original values (column 7, Table 4). However, the calculation of the threshold value of income over which democratization is

implied to reduce corruption is remarkably similar to the previous values, approximately US\$1,500 to US\$2,000. This dynamic panel analysis suggests a long term *Pol* effect of 0.318, whereas the long term effect of *Pol × Lngdp* is 0.042, corresponding to a threshold value of US\$1,941. Compared to the static results of Table 4, this threshold level is remarkably similar.¹⁷ Although previous corruption levels are able to explain current corruption to an outstanding degree, the regime type remains statistically meaningful with its nonlinearity across income levels. Thus, the result does not reflect people being used to corruption but rather them taking advantage of newly opened democratic structures—positively by decreasing corruption in richer countries but negatively by abusing de jure political power in poorer nations. Regarding the second equation, our results suggest that democracy weakly increases income, although the magnitude of this effect seems small.

In summary, the 3SLS results confirm the findings from the simple linear equation model: democracy can reduce corruption but only if the country has already reached a certain income level of approximately US\$2,000 in 2005 US\$. Below this threshold, democratization is suggested to increase corrupt activities.

(c) Results from quantile analyses

Finally, we test whether the derived results are specific to certain corruption levels. For example, it may be possible that the mitigating role of income levels in the corruption-democracy nexus is particular to, say, the most corrupt nations. In this context, OLS and 3SLS regressions return the statistical relationships at the mean. Table 9 shows the results of applying a quantile regression framework.

Specifically, columns (2) to (6) show the outcomes of our main specification at different quantiles of the CPI, whereas column (1) displays the initial OLS results as a reference point. However, these results show no significant differences in the coefficient estimates throughout different quantile levels. In particular, the suggested threshold level of GDP fluctuates between US\$2,208 at the tenth quantile and US\$1,748 at the median. Thus, we do not find evidence of heterogeneity across corruption levels for the intermediating role of income, controlling for two-way fixed effects.

8. CONCLUSIONS

This paper takes another step toward understanding the curious link between democracy and corruption. We hypothesize that democratization only reduces corruption if a basic degree of economic development has already been reached. Intuitively, newly found political power is likely to be abused for private gains if income levels are sufficiently low. In practice, this could be as simple as an opportunity cost argument: if options in the productive sector (proxied by GDP per capita at the macroeconomic level) are sufficiently low, citizens may be more likely to engage in corrupt activities to enhance their limited incomes.

Our empirical analysis provides substantial evidence that income levels drive the nonlinear relationship between democracy and corruption. Democratization is suggested to worsen corrupt behavior in poorer nations with a GDP per capita level of less than US\$2,000 (in 2005 US\$). For richer countries, however, democracy reduces corruption. This finding may explain why many post-Soviet nations, such as Ukraine, actually incurred more corruption after moving toward democratic institutional frameworks, contrary to traditional predic-

tions: their degree of economic development was too low at the time.

This finding is robust to numerous extensions, such as the addition of a variety of control variables and country- and time-specific fixed effects as well as taking into account the endogeneity of income levels in a 3SLS framework and quantile analyses. Further, our analyses show that institutional characteristics are unlikely to account for the role of income in mitigating the effect of democracy on corruption.

The derived results allow several conclusions. First, they provide an explanation for why some countries moving toward democratic structures previously experienced an *increase* in corruption levels, even though the traditional literature suggested otherwise. Second, our findings encourage countries over the suggested threshold level of income to democratize to reap the benefits of lower corruption levels. Third, the corresponding conclusion for the effect of income levels on corruption indicates that more democratic nations experience a stronger effect of income containing corruption. Fourth and finally, we may expect increasing corruption when a poor country moves toward a more democratic society. These insights may help to better anticipate potential problems in young democracies.

NOTES

1. Ehrlich and Lui (1999) and Mohtadi and Roe (2003) rather focus on economic growth as an outcome variable.

2. In a related context, the relationship between economic freedom and corruption has been suggested to differ for poor *versus* rich countries (Graeff & Mehlkop, 2003).

3. Each member of the elite embezzles an absolute value of $\frac{p\gamma}{e}$. Thus, overall corruption amounts to $(e)\frac{p\gamma}{e}$ which divided by GDP (γ) produces pt .

4. See Aiken and West (1991) and Jaccard and Turrisi (2003) for a detailed description of using interaction terms with continuous variables.

5. Given that past variables are unlikely to be influenced by future variables, we feel confident that reverse causality in the remaining factors is unlikely to affect our results.

6. For example, Mauro (1995) chooses ethnic fractionalization as an instrument for corruption. However, this variable is only available once per country (if at all). For an example, see Fearon (2003).

7. Some recent studies have used individual-level survey evidence to study corruption, such as Diaby and Sylwester (2015), Miller (2006).

8. The total sample allows for 159 countries in 2012, which have CPI data available.

9. The distinction between de jure and de facto political power is nicely explained in Acemoglu *et al.* (2005).

10. The following studies find evidence that one or several of these variables affect corruption: Arian (2004), Billger and Goel (2009), Brunetti and Weder (2003), Fan, Lin, and Treisman (2009), Fisman and Gatti (2002), Glaeser and Saks (2006), Knack and Azfar (2003), and Treisman (2000).

11. For instance, Duvanova (2014) shows that the nuanced distinction among institutional characteristics is important when explaining corruption. In another context, Knutsen (2013) finds that the effect of democracy on economic growth can be mitigated by state capacity. We capture state capacity using a variable that measures how well the government is functioning.

12. Calculation of the threshold level for a positive net effect: $-0.326 + 0.044 \times \text{Lngdp} \geq 0$.

13. It is theoretically possible for a country to only have one observation for a certain variable over the 15 year time span—in this case, the average would consist of this one value. In fact, we experimented with a number of different sample definitions. For example, only using countries for which we have at least three or five observations. However, the results are consistent with those displayed in Table 3.

14. Results derived from column (7) in Table 4.

15. We are thankful to two anonymous referees for pointing this out.

16. Tables 6 and 7 exclude press freedom as a control variable to avoid multicollinearity problems, as the correlation coefficients are particularly elevated (mostly beyond 0.8) for these institutional characteristics.

17. Calculation of long term effects: $\frac{\beta_{Pst}}{1 - \beta_{laggedCPI}}$ and $\frac{\beta_{Pst} \times \text{Lngdp}}{1 - \beta_{laggedCPI}}$ (Bewley, 1979).

REFERENCES

- Acemoglu, D., Johnson, S., & Robinson, J. A. (2005). Institutions as a fundamental cause of long-run growth. *Handbook of Economic Growth*, 1, 385–472.
- Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*.

- Alesina, A., Giuliano, P., & Nunn, N. (2013). On the origins of gender roles: Women and the plough. *The Quarterly Journal of Economics*, 128(2), 469–530.
- Andvig, J. C. (2006). Corruption and fast change. *World Development*, 34(2), 328–340.
- Arikan, G. G. (2004). Fiscal decentralization: A remedy for corruption?. *International Tax and Public Finance*, 11(2), 175–195.
- Association, W.V. (2009). World values survey 1981–2008 official aggregate v. 20090901. URL: <http://www.worldvaluessurvey.org>.
- Becker, G. S. (1974). Crime and punishment: An economic approach. In *Essays in the economics of crime and punishment* (pp. 1–54). UMI.
- Bewley, R. A. (1979). The direct estimation of the equilibrium response in a linear dynamic model. *Economics Letters*, 3(4), 357–361.
- Billger, S. M., & Goel, R. K. (2009). Do existing corruption levels matter in controlling corruption?: Cross-country quantile regression estimates. *Journal of Development Economics*, 90(2), 299–305.
- Brosig-Koch, J., Helbach, C., Ockenfels, A., & Weimann, J. (2011). Still different after all these years: Solidarity behavior in East and West Germany. *Journal of Public Economics*, 95(11), 1373–1376.
- Brunetti, A., & Weder, B. (2003). A free press is bad news for corruption. *Journal of Public Economics*, 87(7), 1801–1824.
- Canay, I. A. (2011). A simple approach to quantile regression for panel data. *The Econometrics Journal*, 14(3), 368–386.
- Chowdhury, S. K. (2004). The effect of democracy and press freedom on corruption: An empirical test. *Economics Letters*, 85(1), 93–101.
- Corchón, L. C. (2008). Forms of governance and the size of rent-seeking. *Social Choice and Welfare*, 30(2), 197–210.
- Diaby, A., & Sylwester, K. (2015). Corruption and market competition: Evidence from post-communist countries. *World Development*, 66, 487–499.
- Dincer, O. C. (2008). Ethnic and religious diversity and corruption. *Economics Letters*, 99(1), 98–102.
- Dreher, A., Kotsogiannis, C., & McCorriston, S. (2009). How do institutions affect corruption and the shadow economy?. *International Tax and Public Finance*, 16(6), 773–796.
- Duvanova, D. (2014). Economic regulations, red tape, and bureaucratic corruption in Post-Communist economies. *World Development*, 59, 298–312.
- Ehrlich, I., & Lui, F. T. (1999). Bureaucratic corruption and endogenous economic growth. *Journal of Political Economy*, 107(S6), S270–S293.
- Fan, C. S., Lin, C., & Treisman, D. (2009). Political decentralization and corruption: Evidence from around the world. *Journal of Public Economics*, 93(1), 14–34.
- Fearon, J. D. (2003). Ethnic and cultural diversity by country. *Journal of Economic Growth*, 8(2), 195–222.
- Fisman, R., & Gatti, R. (2002). Decentralization and corruption: Evidence across countries. *Journal of Public Economics*, 83(3), 325–345.
- Fisman, R., & Miguel, E. (2007). Corruption, norms, and legal enforcement: Evidence from diplomatic parking tickets. *Journal of Political Economy*, 115(6), 1020–1048.
- Gatti, R. (2004). Explaining corruption: Are open countries less corrupt?. *Journal of International Development*, 16(6), 851–861.
- Glaeser, E. L., & Saks, R. E. (2006). Corruption in America. *Journal of Public Economics*, 90(6), 1053–1072.
- Graeff, P., & Mehlkop, G. (2003). The impact of economic freedom on corruption: Different patterns for rich and poor countries. *European Journal of Political Economy*, 19(3), 605–620.
- Gundlach, E., & Paldam, M. (2009). The transition of corruption: From poverty to honesty. *Economics Letters*, 103(3), 146–148.
- Harding, M., & Lamarche, C. (2009). A quantile regression approach for estimating panel data models using instrumental variables. *Economics Letters*, 104(3), 133–135.
- Henisz, W. J. (2000). The institutional environment for economic growth. *Economics & Politics*, 12(1), 1–31.
- House, F. (2013). *Freedom in the world 2013. Democratic breakthroughs in the balance*.
- Huntington, S. (1968). *Political order in changing societies*. Yale University Press.
- Islam, N. (1995). Growth empirics: A panel data approach. *The Quarterly Journal of Economics*, 110(4), 1127–1170.
- Iwasaki, I., & Suzuki, T. (2012). The determinants of corruption in transition economies. *Economics Letters*, 114(1), 54–60.
- Jaccard, J., & Turrisi, R. (2003). *Interaction effects in multiple regression* (vol. 72). Sage.
- Jacoby, W. G. (2000). Loess: A nonparametric, graphical tool for depicting relationships between variables. *Electoral Studies*, 19(4), 577–613.
- Knack, S. F., & Azfar, O. (2000). *Are larger countries really more corrupt?* (vol. 2470). World Bank Publications.
- Knack, S., & Azfar, O. (2003). Trade intensity, country size and corruption. *Economics of Governance*, 4(1), 1–18.
- Knutsen, C. H. (2013). Democracy, state capacity, and economic growth. *World Development*, 43, 1–18.
- Levine, R., & Renelt, D. (1992). A sensitivity analysis of cross-country growth regressions. *American Economic Review*, 82(4), 942–963.
- Mauro, P. (1995). Corruption and growth. *The Quarterly Journal of Economics*, 110(3), 681–712.
- Miller, W. L. (2006). Corruption and corruptibility. *World Development*, 34(2), 371–380.
- Mirestean, A., & Tsangarides, C. (2009). *Growth determinants revisited* (vol. 9). International Monetary Fund.
- Mohtadi, H., & Roe, T. L. (2003). Democracy, rent seeking, public spending and growth. *Journal of Public Economics*, 87(3), 445–466.
- Paldam, M. (2002). The cross-country pattern of corruption: Economics, culture and the seesaw dynamics. *European Journal of Political Economy*, 18(2), 215–240.
- Ram, R. (2009). Openness, country size, and government size: Additional evidence from a large cross-country panel. *Journal of Public Economics*, 93(1), 213–218.
- Rock, M. T. (2009). Corruption and democracy. *Journal of Development Studies*, 45(1), 55–75.
- Sandholtz, W., & Koetzle, W. (2000). Accounting for corruption: Economic structure, democracy, and trade. *International Studies Quarterly*, 44(1), 31–50.
- Schneider, F., Buehn, A., & Montenegro, C. E. (2010). New estimates for the shadow economies all over the world. *International Economic Journal*, 24(4), 443–461.
- Serra, D. (2006). Empirical determinants of corruption: A sensitivity analysis. *Public Choice*, 126(1–2), 225–256.
- Shleifer, A., & Vishny, R. W. (1993). Corruption. *The Quarterly Journal of Economics*, 108(3), 599–617.
- Sung, H.-E. (2004). Democracy and political corruption: A cross-national comparison. *Crime, Law and Social Change*, 41(2), 179–193.
- Swamy, A., Knack, S., Lee, Y., & Azfar, O. (2001). Gender and corruption. *Journal of Development Economics*, 64, 25–55.
- Temple, J. (1999). The new growth evidence. *Journal of Economic Literature*, 37, 112–156.
- Treisman, D. (2000). The causes of corruption: A cross-national study. *Journal of Public Economics*, 76(3), 399–457.
- Treisman, D. (2007). What have we learned about the causes of corruption from ten years of cross-national empirical research?. *Annual Review of Political Science*, 10, 211–244.

APPENDIX

Table 10. *Summary statistics*

Variable	Mean	Std. Dev.	Min.	Max.	N	Source	Description
<i>CPI</i>	4.2	2.2	0.4	10	1,806	Transparency international	Corruption Perceptions Index (zero to 10); higher scores indicate less corruption
<i>Pol</i>	14.5	6.2	0	20	1,806	Polity IV	Polity2 Index (−10 to 10, transformed to zero to 20); higher scores indicate more democratic regimes
<i>GDP/capita</i>	10,759.5	15,558.7	127.1	87,716.7	1,806	World Bank	GDP per capita (constant 2005 US\$); we apply the natural logarithm to get <i>Lngdp</i>
<i>Imports</i>	45.3	24.6	8.6	211.2	1,806	World Bank	Imports of goods and services (% of GDP); we apply the natural logarithm to get <i>Lnimp</i>
<i>Gov</i>	15.9	7.4	2	104.9	1,806	World Bank	General government final consumption expenditure (% of GDP)
<i>Edu</i>	5.6	1	3	8	1,806	World Bank	Primary education, duration (years)
Pop in 1,000	49,511.2	158,883.4	424.7	1,350,695	1,806	World Bank	Total population; we apply the natural logarithm to get <i>Lnpop</i>
<i>Urbanrate</i>	57.6	22.2	9.4	100	1,806	World Bank	Urban population (% of total)
<i>Freepress</i>	53.5	23.6	4	95	1,806	House (2013)	Index of freedom of the press (zero to 100); higher scores indicate less freedom
<i>Durable</i>	21.6	34.6	0	203	1,806	Polity IV	The number of years since the most recent regime change (we only incorporate values for democracy); we apply the natural logarithm of $1 + durable$ to get <i>Lndurable</i>
<i>Goveff</i>	0.1	1.0	−1.8	2.4	1,794	World Bank	Government Effectiveness Index (−2.5 to 2.5); higher scores indicate a stronger governance performance
<i>Popgrowth</i>	1.4	1.7	−2.9	17.5	1,803	World Bank	Population growth (annual %)
<i>Lifeexp</i>	69	10.1	40.5	85.2	1,806	World Bank	Life expectancy at birth; total (years)
<i>Inflation</i>	8.4	26.9	−9	728.7	1,710	World Bank	Inflation ; consumer prices (annual %)
<i>Investment</i>	23.2	8.6	1.7	82.9	1,562	PWT 7.1	Investment Share of GDP Per Capita at current prices (PPP Converted)
<i>Trade</i>	87.3	49.2	15.9	444.1	1,806	World Bank	Trade (% of GDP); we apply the natural logarithm to get <i>Lntrade</i>
Political rights	3.2	2.1	1	7	1,402	QoG	Political rights (decreasing from 1 to 7), initially from House (2013)
Civil liberties	3.2	1.7	1	7	1,402	QoG	Civil liberties (decreasing from 1 to 7), initially from House (2013)
Reg. quality	0.1	1.0	−2.4	2.0	1,223	QoG	Regulatory Quality (increasing from −2.5 to +2.5), initially from World Bank
Rule of law	0.0	1.0	−1.9	2.0	1,223	QoG	Rule of law (increasing from −2.5 to +2.5), initially from World Bank
Pol. constraints	0.3	0.2	0	0.7	1,116	QoG	Political Constraints Index III (ranging from 0 to 1, higher scores indicate more political constraint), initially from Henisz (2000)
Indep. judiciary	0.5	0.5	0	1	1,103	QoG	Independent Judiciary, = 1 if there is an independent judiciary, initially from Polity IV
Shadow economy	34.1	14.4	8.4	72.5	1,005	Schneider et al. (2010)	% of informal sector in GDP
Funct. of Gov't	6.4	3.7	0	12	573	QoG	Functioning of Government, ranging from 0 (worst) to 12 (best), initially from House (2013)
Trust in people	1.7	0.2	1.3	2.0	115	QoG	Most people can be trusted, answers take on values of 1 (most people can be trusted) or 2 (can't be too careful), initially from Association (2009)
Interp. trust	0.3	0.2	0.0	0.7	115	QoG	Interpersonal trust, answers take on values of 0 (need to be very careful) or 1 (Most people can be trusted), initially from Association (2009)

Table 11. *Sample countries*

Country	N (CPI ^a)	Country	N (CPI ^a)	Country	N (CPI ^a)
<i>AFRICA</i>		<i>ASIA</i>		<i>EUROPE</i>	
Botswana	15 (5.9)	Singapore	15 (9.2)	Denmark	15 (9.5)
Mauritius	15 (4.9)	Japan	15 (7.1)	Finland	15 (9.5)
Namibia	15 (4.8)	Israel	15 (6.5)	Sweden	15 (9.2)
South Africa	15 (4.7)	Malaysia	15 (4.9)	Netherlands	15 (8.8)
Ghana	15 (3.7)	Jordan	15 (4.9)	Switzerland	15 (8.8)
Senegal	15 (3.2)	Korea, Rep.	15 (4.8)	Norway	15 (8.7)
Tanzania	15 (2.7)	Turkey	15 (3.9)	Luxembourg	15 (8.5)
Zimbabwe	15 (2.6)	China	15 (3.5)	United Kingdom	15 (8.3)
Kenya	15 (2.1)	Thailand	15 (3.4)	Austria	15 (7.9)
Cameroon	15 (2.1)	India	15 (3.1)	Germany	15 (7.9)
Nigeria	15 (2.0)	Philippines	15 (2.7)	Belgium	15 (6.9)
Morocco	14 (3.6)	Vietnam	15 (2.6)	France	15 (6.9)
Malawi	14 (3.2)	Indonesia	15 (2.3)	Spain	15 (6.6)
Egypt, Arab Rep.	14 (3.1)	Kazakhstan	14 (2.5)	Portugal	15 (6.3)
Zambia	14 (2.9)	Pakistan	14 (2.4)	Estonia	15 (6.1)
Uganda	14 (2.4)	Azerbaijan	14 (2.1)	Italy	15 (4.7)
Tunisia	13 (4.8)	Uzbekistan	14 (2.1)	Czech Republic	15 (4.5)
Mozambique	12 (2.8)	Georgia	12 (3.2)	Poland	15 (4.4)
Ethiopia	12 (2.7)	Armenia	12 (2.8)	Greece	15 (4.3)
Cote d'Ivoire	11 (2.3)	Bangladesh	12 (1.9)	Bulgaria	15 (3.7)
Angola	11 (1.9)	Sri Lanka	11 (3.4)	Romania	15 (3.3)
Algeria	10 (2.9)	Kyrgyz Republic	11 (2.1)	Russian Federation	15 (2.4)
Madagascar	10 (2.9)	United Arab Emirates	10 (6.2)	Ukraine	15 (2.4)
Sudan	10 (1.8)	Bahrain	10 (5.4)	Hungary	14 (5.0)
Mali	9 (2.9)	Saudi Arabia	10 (3.9)	Slovak Republic	14 (4.1)
Gambia, The	9 (2.7)	Mongolia	10 (3.1)	Latvia	14 (4.0)
Niger	9 (2.6)	Tajikistan	10 (2.1)	Croatia	14 (3.8)
Sierra Leone	9 (2.2)	Qatar	9 (6.3)	Belarus	14 (3.1)
Congo, Rep.	9 (2.1)	Oman	9 (5.5)	Moldova	14 (2.8)
Congo, Dem. Rep.	9 (2.0)	Kuwait	9 (4.6)	Ireland	13 (7.5)
Chad	9 (1.8)	Nepal	9 (2.5)	Slovenia	13 (6.1)
Rwanda	8 (3.6)	Turkmenistan	9 (1.8)	Lithuania	13 (4.7)
Lesotho	8 (3.5)	Lebanon	8 (2.9)	Albania	12 (2.8)
Burkina Faso	8 (3.2)	Syrian Arab Republic	8 (2.8)	Macedonia, FYR	11 (3.3)
Eritrea	8 (2.7)	Yemen, Rep.	8 (2.4)	Serbia	9 (3.1)
Burundi	8 (2.1)	Lao PDR	8 (2.3)	Montenegro	6 (3.7)
Swaziland	7 (3.1)	Cambodia	7 (2.1)	<i>Total</i>	506 (5.8)
Liberia	7 (2.9)	Bhutan	6 (5.4)		
Benin	7 (2.9)	Timor-Leste	6 (2.4)	<i>NORTH AMERICA</i>	
Mauritania	7 (2.7)	Iran, Islamic Rep.	5 (2.8)	Canada	15 (8.8)
Central African Republic	7 (2.2)	<i>Total</i>	460 (3.7)	United States	15 (7.4)
Equatorial Guinea	7 (1.9)			Costa Rica	15 (4.9)
Libya	6 (2.5)	<i>SOUTH AMERICA</i>		El Salvador	15 (3.8)
Guinea	6 (1.9)	Chile	15 (7.2)	Mexico	15 (3.4)
Cabo Verde	5 (5.1)	Brazil	15 (3.8)	Guatemala	14 (2.9)
Togo	5 (2.5)	Peru	15 (3.8)	Nicaragua	14 (2.6)
Gabon	4 (3.1)	Colombia	15 (3.5)	Honduras	14 (2.4)
Comoros	3 (2.5)	Bolivia	15 (2.6)	Panama	12 (3.4)
Djibouti	1 (2.9)	Ecuador	15 (2.4)	Dominican Republic	12 (3.0)
<i>Total</i>	499 (3.0)	Venezuela, RB	15 (2.3)	Cuba	9 (4.0)
<i>OCEANIA</i>		Uruguay	14 (6.0)	Trinidad and Tobago	8 (4.1)
New Zealand	15 (9.4)	Paraguay	13 (2.1)	Haiti	5 (1.8)
Australia	15 (8.7)	Argentina	9 (2.9)	Jamaica	1 (3.6)
Papua New Guinea	2 (2.4)	Suriname	2 (3.8)	<i>Total</i>	164 (4.2)
Fiji	1 (4.0)	Guyana	1 (2.5)		
<i>Total</i>	33 (8.5)	<i>Total</i>	144 (3.7)		

^a Denotes averages of the CPI over the entire sample period.

Table 12. *Correlation coefficients between the main variables*

Variables	<i>CPI</i>	<i>Polity</i>	<i>Lngdp</i>	<i>Freepress</i>	<i>Lndurable</i>	<i>Pol × Lngdp</i>
<i>1998–2012</i>						
<i>CPI</i>	1.00					
<i>Pol</i>	0.42	1.00				
<i>Lngdp</i>	0.82	0.38	1.00			
<i>Freepress</i>	0.67	0.81	0.60	1.00		
<i>Lndurable</i>	0.62	0.81	0.60	0.81	1.00	
<i>Pol × Lngdp</i>	0.65	0.93	0.67	0.88	0.88	1.00
<i>1998</i>						
<i>CPI</i>	1.00					
<i>Pol</i>	0.45	1.00				
<i>Lngdp</i>	0.82	0.64	1.00			
<i>Freepress</i>	0.65	0.81	0.69	1.00		
<i>Lndurable</i>	0.60	0.84	0.71	0.81	1.00	
<i>Pol × Lngdp</i>	0.66	0.94	0.86	0.86	0.88	1.00
<i>2012</i>						
<i>CPI</i>	1.00					
<i>Pol</i>	0.44	1.00				
<i>Lngdp</i>	0.81	0.36	1.00			
<i>Freepress</i>	0.75	0.81	0.64	1.00		
<i>Lndurable</i>	0.64	0.82	0.60	0.84	1.00	
<i>Pol × Lngdp</i>	0.68	0.92	0.67	0.90	0.89	1.00

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