The Effects of Democratic Institutionalization and Duration on Political Corruption

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Abstract

This study evaluates the theoretical assertion that any level of competitive electoral democracy acts to limit political corruption. The paper proposes a political-economic model examining the impact of both the institutional level of democracy and democratic duration on political corruption via a longitudinal analysis of sixteen years, (2000-2016) of country data drawn from a global dataset. Additionally, the paper explores the potential lagged autoregressive effects of political corruption and validates the importance of gross domestic product per capita (GDPPC) as an important factor in corruption control. Results indicate a strong association between both the level of institutional democracy, and length of stable democratic governance and corruption. Further, the addition of corruption as an autoregressive-lagged dependent variable substantially improves explanatory power and indicates the substantive significance of the previous level of corruption in political corruption models.

Introduction

Political corruption has been found to reduce the rate of economic growth and social development (Rothstein, 2011). Increase inequality and poverty in less-developed societies (Uslaner, 2008), as well as erode public trust in political institutions, with potential negative implications for long-term stability (Porta, 2000) and correlate with poor public health outcomes (Margot et al, 2013). Further, while it is frequently stated that democracy limits political corruption, this causal association has not been settled empirically, and the ongoing academic debate has not reached a consensus. This paper contributes to the discussion by proposing a political-economic model examining the impact of both the institutional level of democracy and democratic duration on political corruption via a longitudinal analysis of sixteen years, (2000-2016) of country data drawn from a global dataset. Additionally, this paper extends previous evaluations of democracy and political corruption by examining and controlling for the autoregressive effects of political corruption. Concluding that the level of democratic institutionalization, length of democratic governance and per-capita gross domestic product are the most salient factors in corruption control.

Literature Review

Although the theoretical argument over the impact of democracy on corruption is older, the current empirical debate centers on two primary avenues of scholarship. The first posits that the level of democracy, measured as the degree of democratic institutionalization is key (Chowdhury, 2004). This approach argues that higher levels of democracy will have an increased effect on the reduction of political corruption. In contrast, a second school of thought argues that the age of a democracy, measured in terms of the number of years of steady democratic

governance is critical (Treisman, 2000). This theory asserts that longer periods of democratic governance reduce political corruption.

Numerous authors utilizing diverse data sets, measures and econometric techniques have contributed to a growing literature on democracy and corruption. Treisman's foundational work employed Freedom House data on political rights and liberties to classify states as democratic, applying a cross-sectional approach to three years of data, 1996, 1997 and 1998, concluding that consecutive periods of democracy have a positive effect on reducing corruption (Treisman, 2000). However, an extension of Treisman's technique, using Freedom House democracy measures and a cross-sectional analysis with 1999 data concluded that the pattern does not hold and suggests that the relationship between democratic duration and corruption is spurious (Paldam, 2002). Further work by Chowdhury shifted the operationalization of democracy measure to consider institutionalization instead of duration. Chowdhury implemented a longitudinal analysis of data from 1995 – 2003, using the Vanhanen's democratization index, concluding that degree of democratization, not duration produced a significant reduction in political corruption (Chowdhury, 2004).

Further work by Serra (2006) utilizing Freedom House political rights data and a dummy variable for uninterrupted democracy using a cross-sectional collapsed average for 1990-1998 concluded that consecutive democracy, not democratic level has a positive relationship with corruption reduction (Serra 2006). A subsequent longitudinal analysis utilizing Polity IV data for democratic years and a global data set from 1982-1997 concluded that democratic duration is positive in a nonlinear inverted U-shaped relationship with corruption, in which corruption initially rises in early democratic years, before eventually falling with increasing years of functional democracy (Rock, 2009).

Subsequently, Iwasaki and Suzuki have reasserted the importance of democratic institutionalization over duration in corruption reduction, utilizing a global data set and longitudinal analysis of the years between 1998-2006, operationalizing democratic institutionalization with the World Bank Democratization Policy Index. Concluding that the observed level of democracy has a positive relationship with reduction of political corruption (Iwasaki and Suzuki, 2012). Pellegata subsequently directly evaluated the two competing empirical arguments utilizing Polity IV data for institutionalization and democratic durability, employing cross-sectional regressions for each year between 1998 and 2003, concluding that the level of democracy was associated in a quadratic manner with political corruption and that democratic durability was also positive and significant (Pellegata 2013). Consequently, demonstrated empirical support for both primary theories of the interaction between corruption and democracy. Finally, Jetter et al have applied a longitudinal analysis of institutionalization and democratic durability, utilizing Polity IV data for 1998-2012, with time and country fixed effects to Conclude that duration is positively correlated with corruption reduction, while level of democratic institutionalization is significant only when interacted with gross domestic product (Jetter et al, 2015). Table 1 provides a summary of measures, data and conclusions for selected literature on democracy and political corruption.

Table 1. Literature on the effect of democracy on corruption

Study	Measure	Data	Conclusion
Treisman (2000)	Political liberties, democratic years (Freedom House)	Cross-sectional 1996-1998	Consecutive years reduce corruption
Paldam (2002)	Political liberties, democratic years (Freedom House)	Cross-sectional 1999	No independent effect of democracy
Chowdhury (2004)	Vanhanen's democratization index	Panel 1995-2003	Democratization has positive effect
Serra (2006)	Democratic years	Cross-sectional collapsed average 1990-1998	Duration has a positive effect
Rock (2009)	Polity IV democratic years	Panel 1982-1997	Duration, positive U shaped
Pellegata (2013)	Polity IV democratic years and institutionalization	Cross-sectional 1998-2003	Positive, quadratic relationship
Jetter et al (2015)	Polity IV democratic years and institutionalization	Pool and panel 1998-2012	Democratization positive

Implications

Beyond the matter of academic curiosity, the impact of democracy on corruption has substantive policy implications, both within developed states from the sound governance and institutional design perspectives, which contribute to efforts to reduce political corruption through reform and perhaps more importantly in international policy organizations and developmental aid. Significant international efforts and resources have been and continue to be expended to foster democratic development in less-developed countries, in part in an effort to combat corruption and improve stability, largely based on the assumption that democratic systems and institutions inherently reduce corruption. As a result, establishing the nature of the

effects of institutionalization of democracy and duration of democracy on limiting political corruption has significant substantive implications for state building policy.

Theory

This study extends the theoretical approach suggested by Pellegata (2013). This theory asserts that any level of democratic electoral competition will act to constrain opportunities for political corruption. Political corruption in electoral democracies can be seen as a principle-agent problem, as defined by Klitgaard (1988), in which voters, principles, elect representatives, agents, to act on their behalf. Within this model, political corruption emerges as a function of relative information asymmetry, in that voters lack adequate information about representative's behavior. As a result, principle-agent corruption models emphasize improving public knowledge about actions of officials and efforts to increase electoral competition (Gurgur and Shah, 2005), based on the assumption that greater electoral competition improves potential accountability to voters and increases the relative cost, or risk, to elected officials when engaging in corrupt activities. Democracies are therefore expected to exhibit lower levels of political corruption (Prezeworski, 1999). Higher levels of democratic institutionalization and longer periods of electoral democracy are generally assumed to enhance this effect.

Hypotheses

Drawing on this minimalist definition of the effects of democratic electoral competition this study will assess the impact of the level of electoral democracy on political corruption, testing five related hypotheses.

H1: The current level of institutionalized democracy has a nonlinear effect on

capacity to limit political corruption.

Further, democratic endurance, additional years of democracy will reduce the level of political

corruption.

H2: Longer periods of stable democracy will reduce political corruption.

Additionally, drawing upon the findings of Jetter et al (2015), it will evaluate the possibility of

interactive effects between level of democracy or democratic endurance and economic

development.

H3: The institutionalized level of democracy has a significant interactive effect

with economic development.

H4: The duration of democracy has a significant interactive effect with economic

development.

Finally, it will evaluate the potential impact of the level of corruption in the previous year on the

observed level in the current year.

H5: The level of corruption in the last period has a significant positive effect on

the level of corruption in the current period.

Research Method

Building on the theory outlined above and stated hypotheses, the dependent variable,

political corruption, is expected to be a function of two primary variables of interest, The level of

democratic institutionalization, and the length of consecutive years of stable democracy.

Combined with possible interactions between the two former factors and economic development,

in addition to standard controls used in similar studies of democracy and political corruption,

including economic freedom, imports as a percentage of GDP, economic development and economic growth.

 The unit of analysis for this study is national data. The sample used consists of a panel comprised of 2025 country years covering the period between 2000 and 2016. For a global data set, consisting of 79 countries in 2000, expanding to 138 countries for the 2016 year. Consequently, this is an unbalanced panel. Data was drawn from common sources for international macroeconomic and political institutional data. See table 2 for a summary of the variables used in this study.

Table 2. Data: definitions and sources

Variable	Definition	Source
CPI	Corruption Perception Index, measures the extent to which public authority is perceived to be used for private gain.	Transparency International (2000-2016)
DEMOC	Institutionalization of democracy, measures the strength of competitive electoral democracy and constraint on elected officials.	Polity IV (2016)
DURABLE	Democratic durability, number of years of stable institutionalized democracy.	Polity IV (2016)
GDPPC	Per capita gross domestic product in 2010 dollars, proxy measure for economic development.	World Bank (2016)
GDP GROWTH	Annual rate of change in gross domestic product as a percentage.	World Bank (2016)
IMPGDP	Imports in 2010 dollars as a percentage of GDP, proxy measure for trade openness.	World Bank (2016)
ECONFREE	Economic Freedom Index, measure of state intervention in the market.	Fraser Institute (2000-2016)

The dependent variable, the measure of political corruption **CPI** in a country in a given year, has been drawn from the *Corruption Perception Index* (CPI)*,* published by Transparency International. CPI measures public sector corruption using a combination of citizen surveys and expert analysis to produce a composite estimation of corruption. Given that corruption involves illegal activity it is notoriously difficult to accurately measure. However, CPI is a widely used and accepted measure in political corruption research (Jetter et al). Prior to 2012, the CPI scale ranged from 0 to 10, starting with the 2012 this scale was changed to 0 to 100. CPI values from before 2012 have been rescaled to allow for a single scale ranging from 0, most corrupt to 100, least corrupt. The mean value for **CPI** across all country years in this study is 42.

The primary explanatory variables, level of democratic institutionalization **DEMOC** and the length in years of consecutive stable democracy **DURABLE**, were taken from the Polity IV Project. **DEMOC** is derived from the Polity IV *democ* variable, which ranges from 0, no electoral democracy to 10, a fully institutionalized democratic state, with the mean observed value being 6. Functionally, this measure evaluates the relative degree to which the executive and legislature are elected in regular and contested national elections (Marshall, Gurr and Jaggers, 2016). Figure 1 indicates a positive and non-linear relationship between democracy and corruption perception.
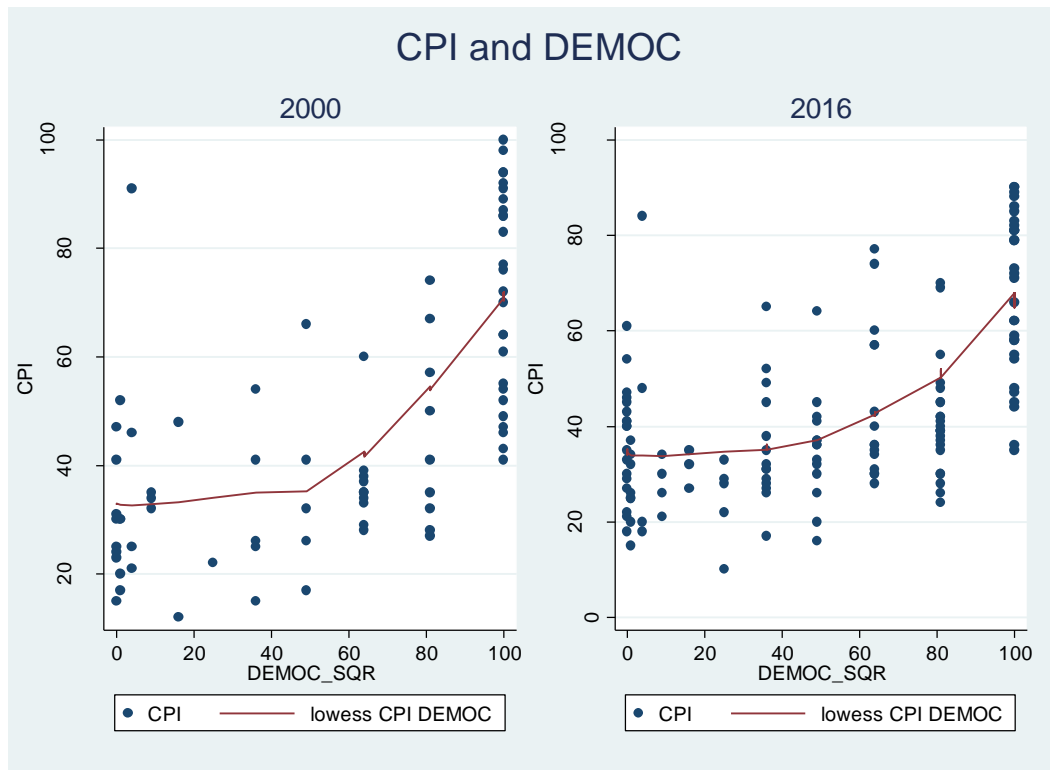
Figure 1. Corruption level and democracy

DURABLE is a continuous measure derived from the Polity IV *durable* variable, counting the number of years since a 3-point change in *polity* score in a single period (Marshall, Gurr and Jaggers). It functions as a measure of institutional stability, the mean value for all countries in this study is 28 years. Both measures are widely used in contemporary literature on democracy and corruption. Further, Polity IV data is superior to Freedom House Political Liberties measures used to operationalize democracy levels in older studies, because the Freedom House data incorporates a corruption measure, which introduces a potential endogeneity problem with corruption (Rock). Figure 2 indicates a positive relationship between democratic durability and corruption perception. For this analysis the Polity IV *durable* scores were zeroed for all country years in which **DEMOC** was 0, excluding stability measures for country years with no level of electoral democracy.
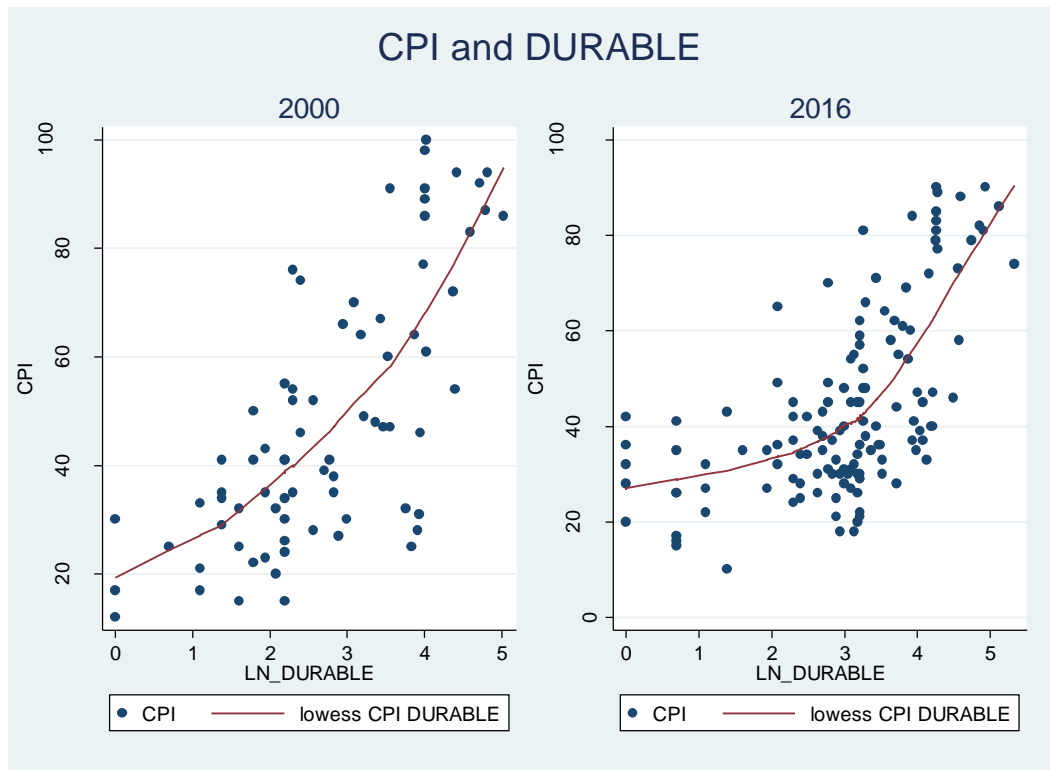
Figure 2. Corruption level and democratic durability

A series of maps are presented in appendix A, to provide a snapshot of the geographic classification of the dataset in 2000 at the beginning of this analysis and in 2016 at the end. The most notable change in CPI across this period is a significant increase in data availability in Africa and South West Asia. The overall trend for countries present across this time period is stable. Blue, relatively uncorrupt countries in 2000 largely remain blue in 2016, with the exception of Eastern Europe, where several countries notably improve and South Africa, which reversed this trend. A similar trend is apparent in the Polity IV democracy variable. Developed countries with high levels of institutionalized democracy remain dark blue in both periods. However, some notable changes have occurred in Africa, South West Asia and South America where there is a trend toward more consolidated democracy across the study period. Finally, a

map of democratic durability, years of stable democracy, is provided to visualize the geographic distribution of democratic countries, as intuitively expected.

Four control variables are included in this study based on the theoretical specification and previous literature. Gross domestic product per capita, **GDPPC,** was obtained from the World Bank *World Development Indicators* and is measured in 2010 US dollars. **GDPPC** has been included as a control for economic development. The minimum observed value is $194, and the maximum is $111,968. The mean is $13,721. Annual rate of change of gross domestic product, **GDP GROWTH** was obtained from World Bank *World Development Indicators* and measures the rate of change in national GDP by year. This is included as a control variable for rate of economic growth. The minimum value is –22%, and the maximum is 33%. The mean observed value is 2.6%. Imports in 2010 US dollars as a percentage of gross domestic product, **IMPGDP,** was obtained from the World Bank *World Development Indicators* and is included as a measure of trade openness. The minimum observed value is 9.2%, and the maximum is 236%. The mean value is 44.5%. Finally, economic freedom, **ECONFREE,** was obtained from the *Economic Freedom Index* produced by the Fraser Institute and serves as a measure of the degree of legal protection offered to private property and assets. Values range from 0, no economic freedom to 10, maximum economic freedom. The minimum observed value is 2.9, and the maximum is 8.8. The median value is 6.80. This is included as a control for the relative capacity of public officials to engage in corruption.

Table 3 provides a descriptive summary of each of the variables used in this study, as well as transformed forms where appropriate. Consistent with previous literature **DEMOC** was squared to test for the previously identified quadratic relationship between institutional level of democracy and political corruption (Pellegata). Additionally, democratic durability, GDPPC and

imports as a percentage of GDP were transformed to improve normality, consistent with

appropriate tests for skewness and kurtosis.

Tale 3. Data: Descriptive Statistics

Variable	Obs.	Min	Max	Range	Mean	Standard Deviation
CPI	2,025	4	100	96	42.76	21.32
DEMOC	2,025	0	10	10	6.24	3.65
DURABLE	2,025	0	207	207	24.77	32.05
GDPPC	2,008	194	111,968	111,774	14,057	19,858
GDP_GROWTH	2008	-22.23	33.03	55.26	2.67	4.11
IMPGDP	1,965	9.20	236.39	227.20	45.22	24.39
ECONFREE	1,654	2.93	8.86	5.93	6.84	0.85
DEMOC_SQR	2,025	0	100	100	52.27	38.15
LN_DURABLE	1,685	0	5.33	5.33	2.86	1.11
LN_GDPPC	2,008	5.27	11.63	6.36	8.53	1.54
SQR_IMPGDP	1,965	3.03	15.38	12.34	6.53	1.61

Methodology

Based on the proceeding theoretical specification three empirical specifications will be

presented and tested. The first is a pooled OLS. The second is a longitudinal panel, and the last is

a dynamic panel incorporating an autoregressive dependent variable.

$$CPI_i = \alpha_0 + \alpha_1 DEMOC_i + \alpha_2 DEMOC\_SQR_i + \alpha_3 DURABLE_i + (\alpha_4 DEMOC_i * LN\_GDPPC_i) + (\alpha_5 DURABLE_i * LN\_GDPPC_i) + \alpha_6 X_i + \delta_i$$

The first specification adopts a pooled OLS regression to test each hypothesis in the aggregate on

the entire dataset, paralleling the cross-sectional approach adopted by several proceeding studies,

such as Treisman (2000), Serra (2006) and Pellegata (2013). This approach estimates the

relationship between corruption levels, measured by the Corruption Perception Index, *CPI*, where higher levels indicate lower corruption and measures of institutional democracy, $DEMOC_i$ and durability $DURABLE_i$. $DEMOC\_SQR_i$ introduces a squared version of the institutionalized democracy variable, intended to evaluate the expected nonlinear and quadratic relationship with political corruption.

Building on the work of Jetter et al (2015), two interactive terms have been included. The first, $DEMOC_i * GDPPC_i$ evaluates a possible interaction between level of democracy and level of development in controlling political corruption. The second, $DURABLE_i * GDPPC_i$ evaluates a possible interaction between duration of stable democracy and level of economic development in controlling corruption. X_i incorporates additional control variables, including imports as a percentage of GDP, as a control for trade flows, GDP per capita as a measure of economic development and the Fraser Economic Freedom index as a measure of government involvement in the market and the annual GDP growth rate. Additionally, based on a visual inspection and confirmed by a Breusch-Pagan test heteroskedasticity is suspected for most variables in this specification. Consequently, heteroskedastistic consistent robust standard errors have been adopted for this estimation.

$$CPI_{it} = \alpha_0 + \alpha_1 DEMOC_{it} + \alpha_2 DEMOC\_SQR_{it} + \alpha_3 DURABLE_{it} + (\alpha_4 DEMOC_{it} * GDPPC_{it})$$
$$+ (\alpha_5 DURABLE_{it} * GDPPC_{it}) + \alpha_6 X_{it} + \alpha_7 C_i + \alpha_8 Z_t + \delta_{it}$$

The second specification adopts a longitudinal panel regression to test the relationship between corruption levels and measures of democratic level and durability across time. Mirroring the approach adopted in specification one $DEMOC_{it}$ and $DEMOC\_SQR_{it}$ are introduced to capture the level of democratic institutionalization. $DURABLE_{it}$ is again used to capture the effects of democratic longevity. The same potential interactions between economic

development and both alternative measures of democracy are implemented. X_{it} contains the same economic control variables as specification one. In addition, consistent with theoretical priors for country-level data and following confirmation with a Hausman test, $p < .05$ C_i implements country fixed effects intended to control for country-specific heterogeneity, including, time invariant elements, such as any cultural, historical or geographical factors. For similar reasons, Z_t incorporates time fixed effects, intended to control for time dependent global effects, such as international macro-economic trends. Finally, cluster robust standard errors were adopted to address the previously identified concerns about heteroskedasticity.

$$CPI_{it} = \alpha_0 + \alpha_1 CPI_{it-1} + \alpha_2 DEMOC_{it} + \alpha_3 DURABLE_{it-2} + \alpha_4 X_{it} + \delta_{it}$$

The third specification builds on the second, implementing an autoregressive dynamic longitudinal panel estimation, incorporating lagged independent variables. Consequently, CPI_{it-1} is introduced in order to estimate and account for the relative effect of last year's level of political corruption on the current level. Further, lagged values were evaluated for all independent variables and adopted, where appropriate, on the basis of statistical and substantive significance. Consequently, both measures of democracy are incorporated, and **DURABLE** is lagged two years, accounting for the delayed effects of changes in stability. The previously tested interactive effects between level of development, and democracy are omitted because they are not significant in longitudinal analysis. X_{it} incorporates imports as a percentage of GDP, GDP per capita and economic freedom, lagged one year, as well as GDP growth.

Table 4. Pooled OLS Regression Results: Dependent Variable CPI 2000-2016

	(1)	(2)	(3)	(4)	(5)
DEMOC	-6.919 ***	-3.980 ***	-2.628 ***	0.269	-1.329 *
	(0.234)	(0.448)	(0.417)	(0.591)	(0.550)
DEMOC_SQR	0.800 ***	0.299 ***	0.192 ***	-0.899 ***	-0.214
	(0.045)	(0.040)	(0.037)	(0.110)	(0.112)
LN_DURABLE	8.306 ***	2.886 ***	-22.363 ***	2.608 ***	-18.702 ***
	(0.433)	(0.314)	(1.339)	(0.290)	(1.662)
SQRT_IMPGDP		0.277	0.597 ***	0.853 ***	0.753 ***
		(0.158)	(0.146)	(0.173)	(0.156)
LN_GDPPC		8.101 ***	-0.683	2.075 **	-1.502 *
		(0.278)	(0.553)	(0.648)	(0.584)
ECONFREE		6.450 ***	5.537 ***	6.861 ***	5.818 ***
		(0.472)	(0.425)	(0.489)	(0.441)
GDP_GROWTH		-0.284 ***	-0.105	-0.193 **	-0.099
		(0.071)	(0.065)	(0.070)	(0.066)
LN_DURABLE X LN_GDPPC			2.964 ***		2.523 ***
			(0.164)		(0.203)
DEMOC_SQR X LN_GDPPC				0.099 ***	0.035 ***
				(0.008)	(0.009)
Constant	22.303 ***	-67.502 ***	4.525	-35.134 ***	5.229
	(1.724)	(3.162)	(4.695)	(5.378)	(4.776)
N	1685	1447	1447	1447	1447
R^2	**0.55**	**0.76**	**0.81**	**0.79**	**0.81**

Robust standard errors in parentheses. * p<0.05 ** p<0.01 ***p<0.001

Pooled OLS

Table 4 presents the results of five pooled OLS regression models. Model 1 presents an uncontrolled model. Model 2 incorporates the full list of control variables. Models 3-5 introduce interaction terms testing an interactive effect between economic development and length of stable democracy (3), economic development and level of democracy (4) and the joint effect of both interactions (5). The significance of **DEMOC_SQR** and positive sign in (1) and (2) indicates support for H1, the hypothesis that the current level of democratic institutionalization has a nonlinear, effect on political corruption, interpreted in (2), with the addition of controls, a one-point change in **DEMOC_SQR**, on a 0-100 scale will result in an approximately .30 point change in **CPI**.   Further; the positive sign and statistical significance at the .05 level for

LN_DURABLE provides support for H2, that longer periods of stable democracy reduce political corruption, interpreted in (2) a one-percent change in **LN_DURABLE** is associated with a 2.88 point change in **CPI,** suggesting that additional years of stable democracy are, in fact, associated with lower political corruption.

The interactive models further extend this analysis. Model 4 provides support for H3, that a significant interactive effect exists between level of economic development and level of democracy on reduction of corruption. However, while the relationship is highly statistically significant and positive, the coefficient is substantively relatively weak, at 0.099. Similarly model 3 supports H4, that a significant interactive effect exists between duration and economic development. Model 5 suggests that both interactive effects are jointly positive and significant.

Results for the control variables are consistent with previous literature. **LN_GDPPC** is positive and statistically significant individually or in combination with the interactive term. The substantive significance of **LN_GDPPC** in (2), accounting for an 8.1 point change in **CPI** given a one-percent change in combination with the positive effects in both interactions is notable. **ECONFREE** is positive and significant across all models. Contrary to previous work, **SQRT_IMPGDP** was found to be significant only in the interactive models. Finally, **GDP_GROWTH** was found to be significant and negative, interpreted in (2), this variable accounts for a –0.28 point decrease in **CPI** given a one-percent increase in GDP growth. This finding could be the result of increased opportunities for political corruption afforded by economic growth.

Consistent with the results of previous cross-sectional research on democracy and political corruption the results of the pooled analysis provide support for a positive relationship between the level of democracy and duration of democracy in reducing political corruption.

Further, these results support interactive effects between GDP per capita and both measures of democracy, as well as the general importance of GDP per capita as a predictor of the level of political corruption, with higher levels of GDPPC correlating with lower levels of corruption. Finally, on the basis of R^2 models 3 and 5 appear to be equally effective, capturing 81% of the variance in levels of political corruption perception. Measured by mean squared error (5) provides a slightly better fit, at 9.66 than (3), at 9.71. Consequently, model 5, incorporating both interactive terms appears to best fit this sample when the data is evaluated in the aggregate.

Table 5. Panel Results with Country and Time Fixed Effects: Dependent Variable CPI 2000-2016

	(1)	(2)	(3)	(4)	(5)
DEMOC	-0.113	0.126	0.328	0.252	0.194
	(0.995)	(0.777)	(0.767)	(0.857)	(0.858)
DEMOC_SQR	0.038	-0.043	-0.056	-0.088	-0.005
	(0.099)	(0.075)	(0.074)	(0.192)	(0.204)
LN_DURABLE	2.070 ***	1.234 **	-2.344	1.249 **	-2.571
	(0.553)	(0.425)	(2.235)	(0.442)	(2.535)
SQRT_IMPGDP		0.710	0.670	0.712	0.665
		(0.407)	(0.410)	(0.409)	(0.415)
LN_GDPPC		19.273 ***	18.391 ***	19.041 ***	18.607 ***
		(2.928)	(2.859)	(2.943)	(2.893)
ECONFREE		1.596 *	1.578 *	1.595 *	1.579 *
		(0.695)	(0.697)	(0.695)	(0.697)
GDP_GROWTH		-0.373	-0.035	-0.038	-0.035
		(0.051)	(0.051)	(0.051)	(0.051)
LN_DURABLE X LN_GDPPC			0.468		0.496
			(0.276)		(0.309)
DEMOC_SQR X LN_GDPPC				0.004	-0.005
				(0.019)	(0.019)
Constant	37.317	-135.500 ***	-129.867 ***	-134.192 ***	-131.045 ***
	(3.075)	(26.260)	(25.855)	(25.922)	(25.718)
N	1685	1447	1447	1447	1447
R^2 Within	0.05	0.26	0.26	0.26	0.26
R^2 Between	0.60	0.70	0.71	0.70	0.71
R^2 Overall	0.51	0.72	0.73	0.72	0.71

Robust standard errors in parentheses. * $p<0.05$ ** $p<0.01$ ***$p<0.001$

Panel Results

Table 5 presents the results of five panel regressions. Mirroring the pooled analysis model 1 is uncontrolled. Model 2 incorporates the full set of controls, while models 3-5 incorporate interactions between economic development and the level and duration of democracy, evaluating this sample over time with time and country fixed effects significantly changes the results.

Neither **Democ** nor **DEMOC_SQR** are significant in any of the models, and the signs indicate that quadratic association noted by Pellegata (2013) and confirmed in the pooled analysis presented here disappears once fixed effects are incorporated. Consequently, rejecting both elements of H1, that the level of democracy had a significant effect on political corruption, and the contention that this effect was nonlinear. However, **LN_DURABLE** remains positive and significant in (1) at the .001 level and in (2) and (3), although at the lower .01 level, interpreted in (2) a one-percent change in duration of democracy is associated with a 1.23 point change in **CPI**, providing support for H2, that longer periods of democracy will reduce political corruption.

Further, the interactive terms between level of democracy H3 and duration H4 with GDPPC as a measure of economic development are no longer significant. Although **LN_DURABLE X LN_GDPPC** retains a positive sign, and model 3 does achieve a one-percent increase in overall R^2 in comparison to model 2 as a result of the inclusion of this interaction. Among the control variables, **SQRT_IMPGDP** retains a positive sign but is insignificant. Similarly, **GDP_GROWTH** retains a negative sign but is also insignificant. **LN_GDPPC** remains highly significant, both statistically at the 0.001 level and substantively, accounting for

an 18.39 point change in **CPI** given a one-percent change in GDPPC. **ECONFREE** also remains weakly significant and positive.

As a collective result, the panel analysis provides support for H2, that longer periods of democracy do reduce political corruption. However, H1, the effect of level of institutionalized democracy, and H3 and H4, incorporating the interactive effects of democracy and economic development must be rejected. These results have two important implications. First, as noted above the duration of democracy is a statistically significant predictor of political corruption within this sample. Second, and arguably more importantly, GDPPC is both highly statistically significant and substantively significant. This result is notable, because while GDPPC is a frequently used proxy measure in political corruption models and is expected to be positive and significant (Pellegata, 2012 and Jetter et al, 2015) the relative impact of GDPPC, 18.39 CPI points per one-percent change in GDPPC in this sample is notable. Potentially indicating that at least within this sample economic development may actually be the most important factor in determining political corruption in democratic countries.

Dynamic Panel

Although the partial support for a positive connection between democratic stability and political corruption coupled with a potentially highly significant linkage between economic development and corruption presented in the panel results is theoretically interesting and broadly consistent with some previous longitudinal studies of democracy and political corruption. This approach does not control for possible autoregressive effects of corruption itself or consider the potential lagged effects of changes in political or economic institutions.

An Arellano-Bond dynamic panel specification, (results not reported here), testing two

lagged values of **CPI** was used to establish the significance of the level of corruption in a

previous period on corruption in the current period. GDP growth was withdrawn from the control

variables and used as the endogenous contemporaneous regressor for this estimation. Second

order autocorrelation was tested with an Arellano-Bond test for autocorrelation, $p > .05$ and over

identification was tested with a Sargan Test, $p > .05$. The results of the dynamic pool analysis

indicate that while the first lagged value, **CPI-1** is positive and significant at the .01 level in a

fully controlled model, the second lag was not significant. Building on this finding an

autoregressive dynamic panel was specified and tested.

Table 6. Autoregressive Dynamic Panel with Country and Time Fixed Effects: Dependent
Variable CPI 2000-2016

	(1)	(2)	(3)	(4)	(5)
CPI L1	0.697 ***	0.696 ***	0.660 ***	0.647 ***	0.750 ***
	(0.044)	(0.044)	(0.042)	(0.046)	(0.040)
DEMOC	0.406 ***	0.367 ***	0.338 ***	0.290 **	0.318 **
	(0.068)	(0.078)	(0.085)	(0.087)	(0.096)
LN_DURABLE L2	0.955 ***	0.770 ***	0.673 ***	0.735 **	0.760 **
	(0.235)	(0.193)	(0.199)	(0.230)	(0.190)
SQRT_IMPGDP		-0.092	0.199	0.173	0.182
		(0.230)	(0.225)	(0.242)	(0.256)
LN_GDPPC			6.239 ***	6.033 ***	4.343 ***
			(1.247)	(1.428)	(1.226)
ECONFREE L1				1.499 **	1.442 ***
				(0.544)	(0.428)
GDP_GROWTH					0.199
					(0.122)
Constant	8.120 ***	9.357 ***	-43.296 ***	-50.775 ***	-40.616 ***
	(1.806)	(2.766.)	(10.351)	(11.743)	(10.803)
N	1514	1463	1461	1313	1067
R^2 Within	0.52	0.55	0.56	0.57	0.65
R^2 Between	0.99	0.99	0.92	0.93	0.95
R^2 Overall	0.97	0.97	0.92	0.93	0.95

Robust standard errors in parentheses. * $p<0.05$ ** $p<0.01$ ***$p<0.001$

Table 6 presents the results of an autoregressive dynamic panel incorporating a one-year lag for **CPI** in order to control for the effect of the level of corruption in a previous period on corruption in the current period. Five models were tested, an uncontrolled model, and four models gradually incorporating economic controls, including a two-year lag for **LN_DURABLE**, in order to adjust for delays in the effects of changes in political stability and a one-year lag for **ECONFREE**, to account for delays in changes to economic freedom.

The results demonstrate a significant improvement in explanatory power, improving the overall R^2 from 0.73 in the panel results to 0.95 in (5), the best fitting model selected on the within R^2 criteria. Further, this specification represents a significant improvement over previously reported R^2 measures of 0.84 (Pelegata, 2013) and 0.78 (Jetter et. al. 2015). **CPI-1** is positive and significant at the .001 level in all five models. Indicating as read in (5) that a one-point change in last year's level of corruption accounts for a .75 point change in this year's level of corruption. Providing support for H5, that previous levels of corruption have a positive and significant effect on the current period. Suggesting that changes in corruption perception are gradual and heavily dependent on past values. In addition, **DEMOC** is significant at the .01 level across all five models, providing partial support for H1. The current level of institutionalized democracy does have a positive impact, on political corruption. However, the hypothesized nonlinear relationship is not present. Further, **LN_DURABLE** remains positive and significant at the .01 level, supporting H2, that longer periods of stable democracy reduce political corruption. The hypothesized interactions were found to be insignificant in the earlier panel analysis and were omitted from the dynamic panel.

Amongst the control variables, **LN_GDPPC** is positive and significant at the .001 level indicating in (5), that a one-percent change in GDPPC is associated with a 4.34 point change in

CPI. While **ECONFREE** is also significant at the .001 level and indicates that corruption control is sensitive to levels of economic freedom. All other control variables were found to be insignificant. This suggests, on the basis of model (5) that once autoregressive effects are factored into the specification the general theoretical argument that increasing levels of democratization and increasing duration of stable democracy are associated with increasing **CPI** values is empirically supported. Meaning that, as democratic institutions are strengthened political corruption is expected to decrease. Further, among the economic controls the positive and significant value for **ECONFREE** indicates that economies with better property right protections, and fewer opportunities for direct government involvement in the economy are likely to be less corrupt. Simultaneously, economic development, as measured by GDP per-capita also remains substantively significant, accounting for a 4.34 point change in corruption perception given a one-percent change in GDP per-capita.

Implications

The specifications presented above provide three notably different sets of conclusions. When this sample of sixteen years of data from 2000-2016 is evaluated in the aggregate both the level of democratic institutionalization, and the duration of democratic governance are statistically and substantively significant. Consistent with past research, all four applicable hypotheses, including the proposed interactive effects between democracy and development in corruption control are substantiated. In contrast when fixed time and country effects are introduced in the panel specification, the length of democratic governance remains significant, providing support for H2. However, the level of democracy and interactive terms become insignificant, consequently rejecting H1, H3 and H4. In addition, economic development,

represented by GDPPC becomes notably important in the panel results. Finally, when an autoregressive-lagged value of corruption perception is incorporated in a dynamic panel, both measures of democracy remain significant, supporting the theoretical argument that institutionalized democracy and democratic stability reduce corruption. Further, the hypothesis that past levels of corruption have a significant effect on present levels is also supported.

Collectively given the autoregressive effects of political corruption and the lagged effects of political stability these findings are interpreted to indicate that changes in levels of political corruption are likely to be incremental and that policy focused on gradual change is likely to be more effective than snap anti-corruption campaigns aimed at massive single period shifts in political corruption. Additionally, while GDPPC has appeared as a positive and significant variable in multiple recent analyses of political corruption, (Rock, 2009; Pellegata, 2013; Jetter et all, 2015) this analysis adds additional support for the contention that richer societies are likely to be less corrupt and indicates that these findings are robust across both cross-sectional and longitudinal analysis.

It should be noted, however, that this data set covers a later period than comparable studies and does not analyze data before 2000. There have been relatively few democratic transitions covered within this study period and many of the democracies that emerged in the early 1990s had experienced approximately a decade of democratic experience by the point at which this sample begins. Consequently, the difference in potential causal mechanisms outlined in this study versus the previously demonstrated effects of level of democratic institutionalization or duration in previous studies may be a partial result of sampling periods.

Generalizing from this sample it appears that three primary political policy recommendations can be made. First, there is broad empirical support for the theory that both

increasing levels and duration of electoral democracy reduce political corruption, with democratic duration, stability over time, accounting for a substantively more significant effect than increasing institutionalization. Consequently, democratic state building policies should emphasize stability and therefore, democratic duration over rapid absolute gains in measures of institutionalization. Put more simply, although it seems counter intuitive, more democracy, in years, may be better from a corruption reduction standpoint than better democracy. Second, an important predictor of political corruption in a given period is, perhaps unsurprisingly, the level of corruption in the last period. One important implication of this, in combination with the aforementioned point about democratic duration, is that political corruption will change incrementally. Gradual reform may be more likely to succeed than rapid single period policy reforms. Third, political corruption is influenced by GDPPC in democracies. Countries with higher levels of GDPPC should be expected to be less corrupt. This may mean that development and state building efforts focused on encouraging the entrenchment of stable democracies in developing nations should not only aim to foster the development of good democratic political institutions but also seek to stimulate polices, which increase the GDPPC. Per capita economic success should be seen as contributing to the development of clean and stable democracies, rather than as a benefit of democratic development.

Conclusions

This study tested the theoretical argument that any level of electoral democracy, measured both as the level of institutionalized democracy and as the duration of democracy has a positive effect on reduction of political corruption, measured as perceived political corruption. It has presented and evaluated three empirical specifications, a pooled OLS estimate, a panel

estimate and an autoregressive dynamic panel and tested five hypotheses. Both measures of democracy, institutionalization and democratic duration were found to be significant and positive. Further, in keeping with previous research GDPPC was found to have a significant effect on political corruption. Finally, the level of political corruption in the previous year was found to be an important predictor of current political corruption.

Consequently, taken as a whole this study finds consistent support for a connection between level of democracy and political corruption, but rejects H1, that the current level of democracy affects the capacity to limit political corruption in a nonlinear manner. Second, it finds strong support for H2, that longer periods of stable democracy reduce political corruption. However, the hypothesized interactions between economic development and democracy, H3 and H4, are not supportable and must be rejected. Finally, there is strong support for H5, the hypothesized link between past and present levels of political corruption.
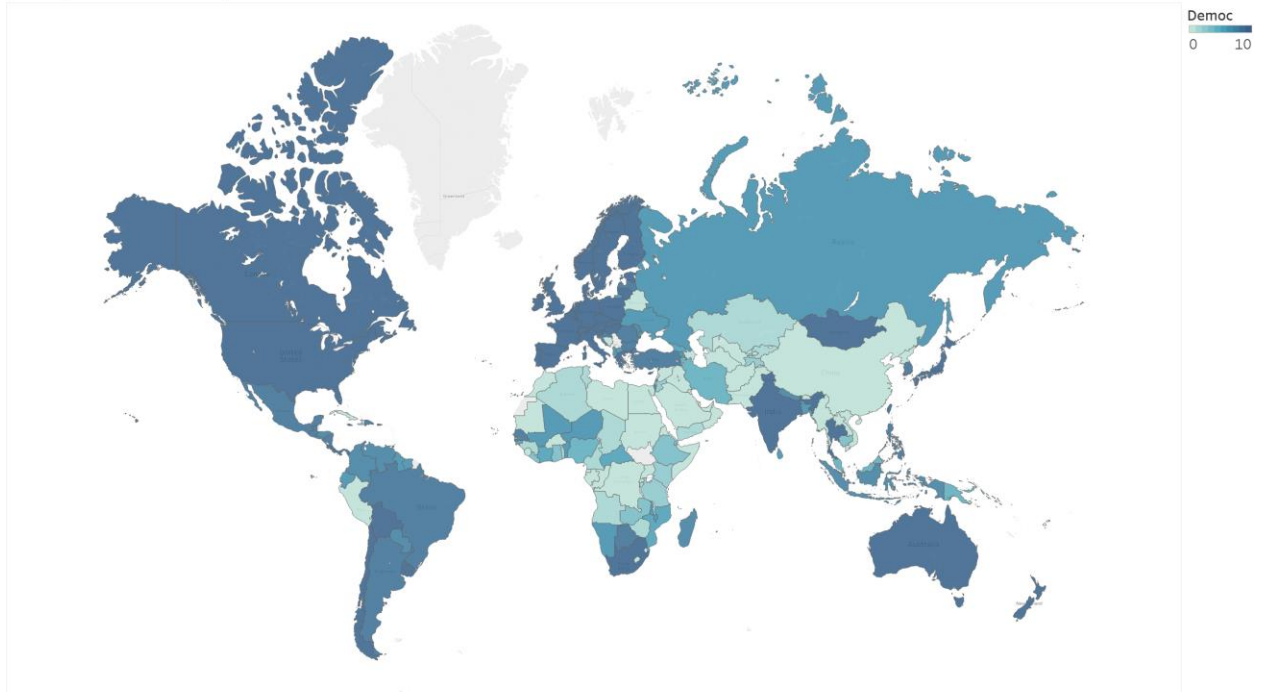
The robustness of these conclusions could be improved in two primary ways. First, as a result of data availability the data set used is unbalanced. Incorporation of additional data sources could reduce the number of incomplete country cases. In addition, the length of the study period could be increased to 1995, the first year for which CPI data is available, in order to better overlap similar studies. Second, additional measures of democracy and corruption could be employed to test the robustness of the theoretical conclusions using different data and validate these findings.

Finally, these results suggest two avenues for future research. First, older studies, specifically those covering earlier periods of time could be reevaluated with the inclusion of a dynamic autoregressive panel approach to determine whether the results are robust to the inclusion of lagged corruption values. Second, although this study evaluated and dismissed the

possibility of significant interactions between the level of economic development and either measure of democracy, future research should consider the possibility of interactive effects between the level of democratic institutionalization and duration, examining whether longer stable periods of highly institutionalized democracy are collectively more or less effective at reducing corruption in an interactive manner.
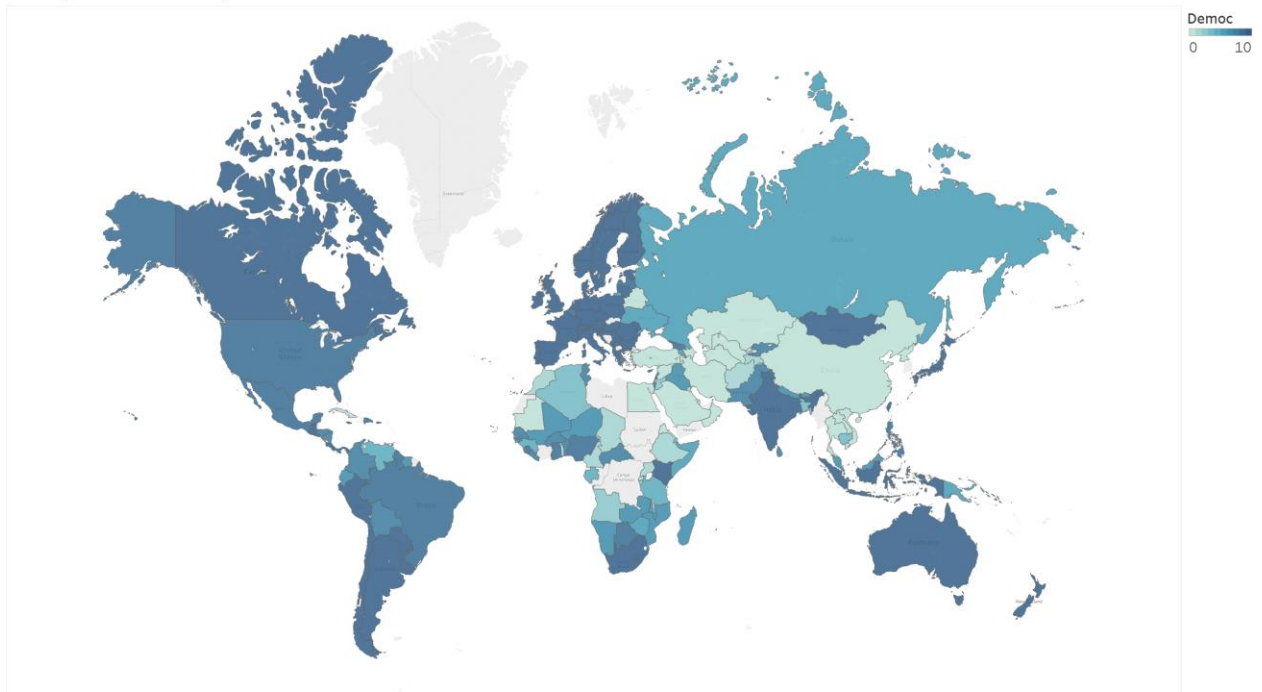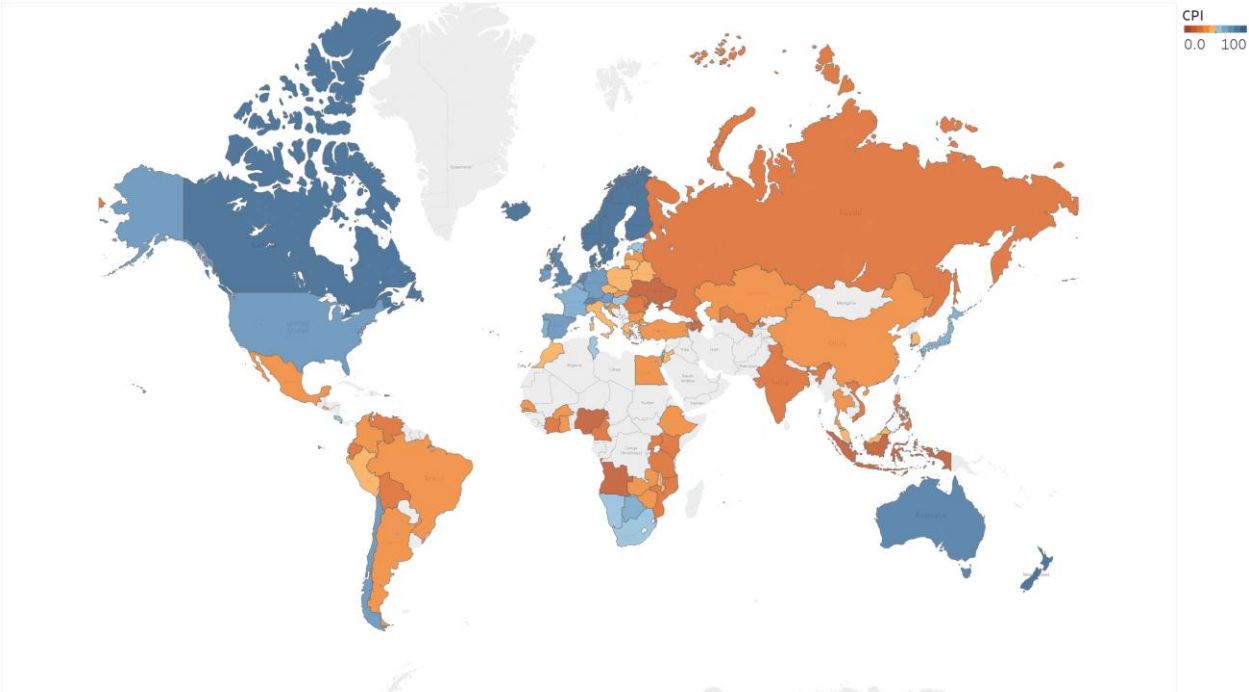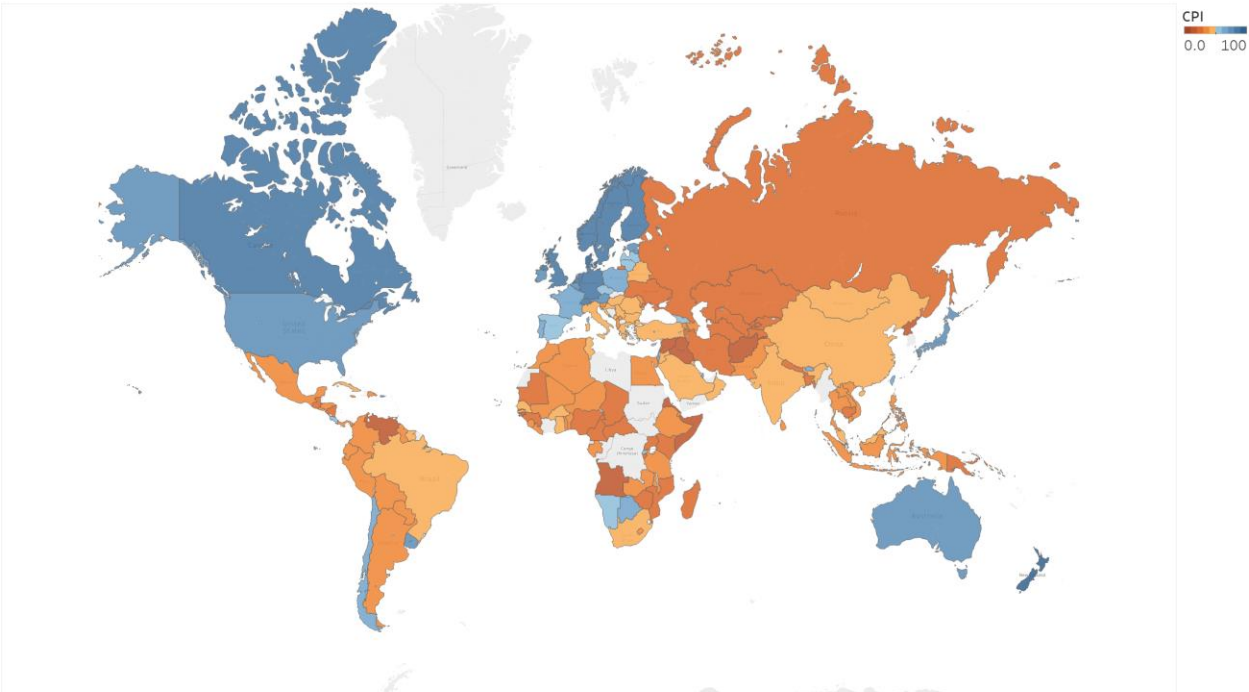
Appendix A

Polity IV Democracy 2000

Map based on Longitude (generated) and Latitude (generated). Color shows sum of Democ. Details are shown for Country. The data is filtered on Year, which ranges from 2000 to 2000.

Polity IV Democracy 2016

Map based on Longitude (generated) and Latitude (generated). Color shows sum of Democ. Details are shown for Country. The data is filtered on Year, which ranges from 2016 to 2016.
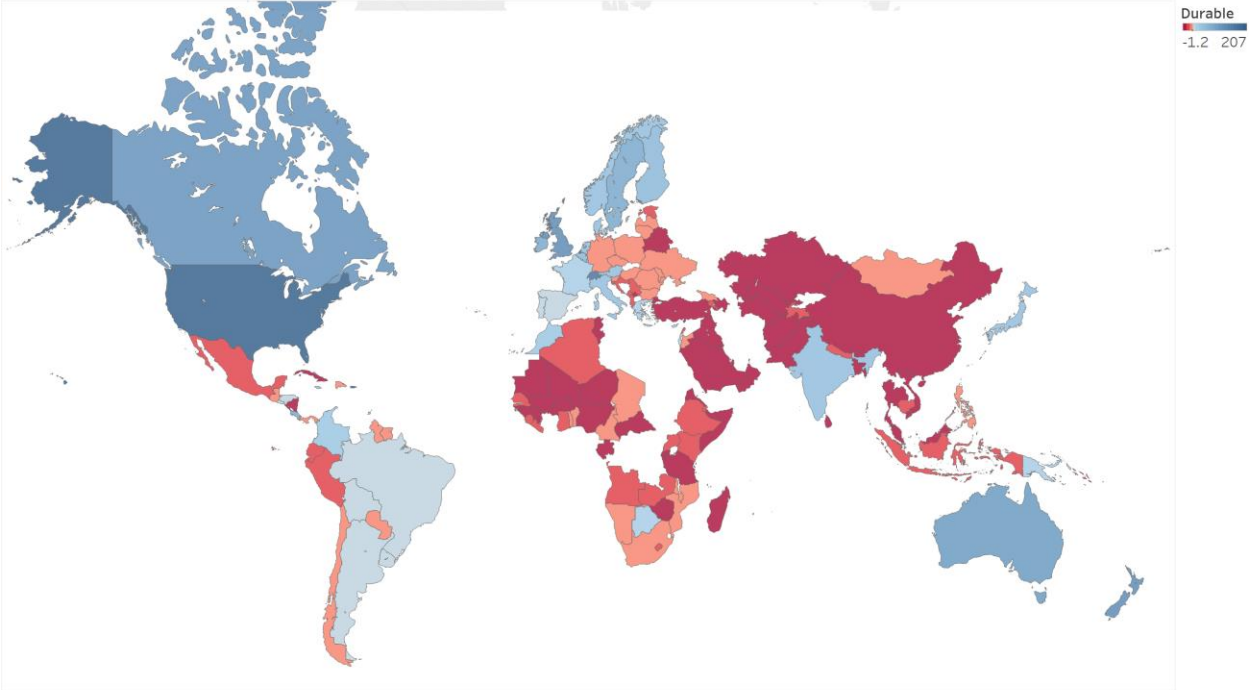
CPI 2000

Map based on Longitude (generated) and Latitude (generated). Color shows sum of CPI. Details are shown for Country. The data is filtered on Year, which ranges from 2000 to 2000.

CPI 2016

Map based on Longitude (generated) and Latitude (generated). Color shows sum of CPI. Details are shown for Country. The data is filtered on Year, which ranges from 2016 to 2016.

Polity IV Democratic Durability 2016

Map based on Longitude (generated) and Latitude (generated). Color shows sum of Durable. Details are shown for Country. The data is filtered on Year, which ranges from 2016 to 2016.

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