Dimensions of Economic Freedom and Cross-Country Corruption

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Abstract

This study contributes to the empirical literature on the nexus between economic freedom and corruption in the consideration of different measures of economic freedom and corruption. Our empirical results across countries and accounting for possible reverse feedbacks, consistently show that greater economic freedom lowered corruption across alternative corruption measures. This is true when economic globalization is used as an alternative indicator of economic freedom. In addition, when a hard proxy for economic freedom in the form of the age of the central bank (also capturing the longevity of economic institutions) is used, the negative effect on corruption holds, albeit with somewhat weaker statistical support. Larger government size lowered corruption, a finding consistent with better enforcement with larger governments reducing corruption, rather than with greater bureaucracy increasing corruption. The influences of democracy (including spatial democracy) and ethnic fractionalization did not significantly impact corrupt activities, although there was some support for more prosperous countries with a greater share of the Protestant population being less corrupt. Finally, former colonies were found to be more corrupt in a majority of the cases, while the reverse was true for countries experiencing more coups. A novel finding is the pronounced impact of coups on grand corruption. Another insight is that political institutions in the form of democracy are ineffective, but economic institutions in the form of the age of the central bank play a significant role.

1 Introduction

The impact of pro-market institutions, usually captured by some measure of aggregate economic freedom, has attracted the attention of researchers and policymakers alike (for general reviews of the literature on economic freedom see Berggren, 2003; Hall and Lawson, 2014; Cebula et al., 2015; Stansel and Tuszynski, 2017; Lawson et al., 2024).[1] According to Gwartney et al. (2023, pg. 1), "[t]he cornerstones of economic freedom are personal choice, voluntary exchange, open markets, and clearly defined enforced property rights." The literature abounds with evidence that economic freedom impacts per capita income (Cebula et al., 2012), economic growth (De Haan and Sturm, 2000; Cebula and Clark, 2012), migration (Cebula, 2014), quality of life (Esposto and Zaleski, 1999), income inequality (Berggren, 1999; Carter, 2006), homelessness (Cebula and Saunoris, 2021), and entrepreneurship (Bjørnskov and Foss, 2008; Nyström, 2008; Sobel, 2015; Shakya and Plemmons, 2021).

While economic freedom is useful in capturing "good" institutions, public corruption often signals a weakening of institutions (see Goel and Saunoris, 2022). Corruption is defined by Transparency International as "the abuse of entrusted power for private gain."[2] Intuitively speaking, corruption stems from two

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[1]This paper is part of a symposium in honor of Dr. Richard Cebula.
[2]https://www.transparency.org/en/what-is-corruption

main reasons – (a) the propensity of individuals (potential bribe givers) to bypass regulations, where often the regulations are artificially created by rent-seekers (bureaucrats) to solicit bribes. Dismantling of barriers/regulation, broadly referred to as economic freedom, presents fewer opportunities for corrupt interactions, resulting in lower corruption. The use of the internet in the offering of government services, with no or little physical interactions and the round-the-clock access is a recent example of technology aiding in the lowering of regulatory bottlenecks (Goel and Saunoris, 2016); (b) even in relatively economically free economies with few obtrusive regulations, relatively more impatient individuals (bribe takers) might choose to bribe to jump queues – i.e., obtain preferential treatment in the award of government contracts or bypass due processes, such as in government hiring. The latter aspect, tied to individuals' personal attributes (impotence, risk aversion) is hard to capture empirically. Thus, we focus on the former (economic freedom), with the main contributions lying in the use of alternative measures of economic freedom and of corruption (an activity that is only imperfectly measured at best).

A variant of the literature on economic freedom looks at how economic freedom impacts corruption. Understanding the nature and causes of corruption has intrigued researchers for some time. Indeed, an understanding of the causes of corruption is a first step in developing effective methods for eradicating it. Among the various factors that have been identified as determinants of corruption in the literature, the relationship between economic freedom and corruption has attracted particular interest among researchers (see, e.g., Goel and Nelson, 2005; Apergis et al., 2012; Pieroni and d'Agostino, 2013). In less economically free countries, where the government controls much of the production and distribution of goods and services, there are ample opportunities for corruption. For example, bribes may be demanded for special government permissions, such as licensing or permits, or for expanding regulations to make it more difficult for firms to enter specific industries.

Generally, the empirical literature finds a negative relationship between corruption and economic freedom (Chafuen and Guzmán, 2000; Paldam, 2002; Shen and Williamson, 2005; and Carden and Verdon, 2010). However, research indicates that the relationship between corruption and economic freedom is nuanced and conditional on factors such as the level of development, democracy or political freedom, and the extent of corruption.[3]Graeff and Mehlkop (2003) discover that the relationship between corruption and economic freedom is conditional on the level of development of a country and to different dimensions of economic freedom. Goel and Nelson (2005) ask whether political freedom or economic freedom is most effective at combating corruption. Using cross-country data, they find that economic freedom is more effective at combating corruption; however, not all dimensions of economic freedom are effective at reducing corruption with monetary freedom showing a strong corruption-reducing effect. Using a cross-country analysis, Saha et al. (2009) also show an interaction effect of economic freedom and political freedom on corruption. In particular, they find that economic freedom reduces corruption regardless of political freedom while democracy reduces corruption only in countries with lower levels of economic freedom. The relationship between corruption and economic freedom may depend on the prevalence of corruption within a country. For instance, Billger and Goel (2009) use cross-sectional data on approximately one hundred countries and apply quantile regression, finding that the negative effect of economic freedom on corruption is sensitive to the level of corruption within a country.

Several studies explore the potential bi-directional relationship between corruption and economic freedom. Apergis et al. (2012) investigate the potential bi-directional relationship between corruption and economic freedom across U.S. states using a panel error correction model and find evidence of a bi-directional relationship between the two. Yamarik and Redmon (2017) examine the bi-directional relationship between corruption and economic freedom for a panel of over 160 countries using a General Method of Moments (GMM) estimator and reveal that corruption negatively impacts economic freedom, while economic freedom does not have a statistically significant effect on corruption. Hall et al. (2020) provide evidence of a unidirectional relationship from economic freedom to corruption using a panel vector autoregressive framework with cross-country panel data.

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[3]Swaleheen and Stansel (2007) find that the effect of corruption on economic growth depends on the level of economic freedom. Specifically, in less economically free countries, corruption decreases economic growth, while in more economically free countries, corruption increases growth. Heckelman and Powell (2010) also find that corruption's effect on growth is conditional on economic freedom; however, in contrast to Swaleheen and Stansel (2007), they find that corruption enhances growth when economic freedom is low, and this effect diminishes as economic freedom increases. Malanski and Póvoa (2021) similarly conclude that economic freedom moderates the relationship between corruption and growth in emerging countries in Latin America and Pacific Asia.

Another aspect of the relationship between economic freedom and corruption is the recognition that both are multidimensional (Ades and Di Tella, 1997; Graeff and Mehlkop, 2003). For instance, the overall economic freedom index from the Fraser Institute is comprised of five subcomponents including size of government, legal system and property rights, sound money, freedom to trade internationally, and regulation. While the literature has considered the multidimensionality of economic freedom and its varied effects on corruption, there is a lack of research on the different dimensions of corruption and how economic freedom may have differentiated effects on various types of corruption. Indeed, corruption can be categorized into two forms: petty or grand corruption.[4] Transparency International defines petty corruption as "everyday abuse of entrusted power by public officials in their interactions with ordinary citizens, who often are trying to access basic goods and services in places like hospitals, schools, police departments and other agencies", whereas grand corruption is defined as "the abuse of high-level power that benefits the few at the expense of the many, and causes serious and widespread harm to individuals and society. It often goes unpunished."[5]

Theoretically, economic freedom is most closely tied to grand corruption. Petty corruption occurs day-to-day on a smaller and more local scale in interactions between a bribe giver and a bribe receiver, where local officials may demand bribes in exchange for access to goods and services. In contrast, grand corruption is more closely associated with higher-level institutions which determine the rules of the game in which economic actors interact. Economic freedom is often linked to a reduction in government control over the economy, such as through deregulation and increased competition, which can diminish opportunities for rent-seeking by public officials. In other words, economic freedom affects grand corruption by its influence on the broader institutions that govern the government's role in the economy.

While the hypothesis that economic freedom is negatively associated with corruption is commonplace within the literature, we test the validity of this relationship via a battery of measures of economic freedom and of corruption. Furthermore, the consideration of coups and colonial heritage adds to the literature comparing the relative effects of economic and political freedom on corruption (Goel and Nelson, 2005).

2   Data

The data is a cross-sectional data set comprised for 100 countries. Due to many missing observations for the corruption variable and to protect against measurement error, we took the average from 2000 to 2020 for all variables—see Table 1 for variable definition and sources, Table 2 for summary statistics, and Table 3 for a list of the countries used in the analysis.[6]

To measure corruption, we consider two measures: Corruption Perceptions Index (Corruption1) and Overall Corruption Index (Corruption2). The Corruption Perceptions Index is a widely used measure of corruption from Transparency International and is based on the perceptions of public sector corruption from experts and business executives. The index is measured on a scale from 0 to 100, but it has been rescaled so that higher numbers now denote more corruption. The average corruption score is 53.2 ranging from a high of 81.6 (Guinea-Bissau) and a low of 10.6 (Denmark). Crombach and Smits (2024) develop the Overall Corruption Index as a combination of petty and grand corruption. This index is based on data from over a million individuals across 807 national surveys, drawn from 13 different sources, and includes 103 relevant questions related to governance. Interestingly, while the average Corruption Perceptions Index suggests that the sample is generally more corrupt, the Overall Corruption Index indicates that the sample is, on average, less corrupt with a score of 39.6. However, the range is smaller, spanning from a high of 74.8 (Democratic Republic of the Congo) to a low of 12.8 (Denmark). This observation suggests that while these two measures of corruption are intended to capture overall corruption, they may be capturing slightly different aspects of it.

Novel to this study is an index capturing one particular form of corruption, namely grand corruption

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[4]https://www.transparency.org/en/corruptionary

[5]At a broader level, both corruption and economic freedom can impact economic growth, and these relationships have been studied separately (Mauro, 1995; Lawson et al., 2024), and in conjunction (Swaleheen and Stansel, 2007).

[6]One could alternatively choose to estimate a panel, exploiting the underlying time dimensions. However, since in this case most of the institutional variables change gradually over time, taking averages seems more appropriate. Nonetheless, we re-estimated the baseline models using a two-way random effects model with instrumental variables estimation, and the results confirmed the baseline findings. These results are available upon request from the authors.

Table 1: Variable Definitions and Sources

Variable	Definition	Source
Economic Freedom	Index measuring the degree of economic freedom, which is comprised of five areas of economic freedom including: government size, the legal system and property rights, sound money, trade freedom, and regulation. The index has been rescaled from 0 to 100 with higher numbers signifying more economic freedom.	Fraser Institute
Economic Freedom2	Index measuring the degree of economic freedom based on four categories: (1) Rule of Law; (2) Government Size; (3) Regulatory Efficiency; and (4) Open Markets. The index is on a scale from 0 to 100 with higher numbers signifying greater economic freedom.	Heritage Foundation
Age of Central Bank	The number of years since a central bank was established.	Wikipedia (nd)
Economic Globalization	Index measuring the degree of economic globalization, which is comprised of trade globalization and financial globalization. The index is on a scale from 0 to 100 with higher numbers signifying greater economic globalization.	Gygli et al. (2019)
Corruption1	Index measuring the degree of corruption perceptions. The index has been rescaled from 0 to 100, with higher numbers denoting more corruption.	Transparency International
Corruption2	Index measuring the degree of corruption, which is comprised of petty corruption and grand corruption. The index has been rescaled from 0 to 100, with higher numbers denoting more corruption.	Crombach and Smits (2024)
Corruption3	Index measuring the degree of grand corruption in a country measured across eleven dimensions. The index has been rescaled from 0 to 100, with higher numbers denoting more grand corruption.	Crombach and Smits (2024)
lnGDP	The log of GDP per capita in constant 2017 int. dollars.	World Bank
Democracy	Binary variable equal to one if the country is a democracy and zero otherwise.	Bjørnskov and Foss (2008)
Neighboring Democracy	The unweighted average of neighboring countries' Democracy variable.	Bjørnskov and Rode (2020)
Government Size	Total government consumption expenditures as a percentage of GDP.	World Bank
Government Employment	Central government employment measured as civilian government administration as a percentage of the labor force.	Schiavo-Campo et al. (1997)
Protestant	The percentage of the population that belongs to the Protestant religion (in 1980).	La Porta et al. (1999)
Ethnic Fractionalization	Ethnolinguistic fractionalization measured as the probability of two randomly selected people belonging to different ethnolinguistic groups.	La Porta et al. (1999)
Former Colony	Binary variable equal to one if the country is a former colony and zero otherwise.	Dharmapala (2021)
Number of Coups	The number of (successful or unsuccessful) coup d'état attempts.	Bjørnskov and Rode (2020)
Genetic Distance	Genetic distance measured as the genetic distance in 1900 between the ruling elites in a country and its ethnic majority.	Dharmapala (2021)
lnArea	The log of the surface area of a country measured in square kilometers.	World Bank

Note: All data are at the country-year level, and, unless otherwise specified, are averaged over the years 2000 to 2020.

Table 2: Summary statistics

	Observations	Mean	Standard Deviation	Maximum	Minimum
Economic Freedom	100	68.435	9.475	87.281	44.990
Economic Freedom2	100	61.928	9.640	88.081	34.733
Age of Central Bank	100	86.140	58.275	353.000	0.000
Economic Globalization	100	56.429	16.650	93.151	25.861
Corruption1	98	53.205	20.549	81.556	10.556
Corruption2	100	39.613	12.137	74.800	12.786
Corruption3	100	49.399	14.643	89.100	8.900
lnGDP	100	8.966	1.208	11.298	6.540
Democracy	100	0.700	0.414	1.000	0.000
Neighboring Democracy	100	0.635	0.341	1.000	0.000
Government Size	100	15.246	4.830	28.186	5.358
Government Employment	80	3.326	2.779	14.600	0.200
Protestant	100	15.052	21.989	97.800	0.000
Ethnic Fractionalization	100	0.352	0.307	0.890	0.000
Former Colony	99	0.737	0.442	1.000	0.000
Number of Coups	100	0.460	0.979	6.000	0.000
Genetic Distance	100	794.614	769.923	2,288.000	0.000
lnArea	100	12.302	1.907	16.106	6.064

(Corruption3). Grand corruption involves the changing of rules and regulations that fundamentally alter the economic playing field, significantly impacting the propensities to engage in corrupt behaviors. These initiatives have inertia, with the potential to change the nature of corruption in a country for some time. With the macro nature of the aggregate economic freedom variables used in this study, it likely makes sense to consider their effects on grand corruption.[7]

Crombach and Smits (2024) present the first empirical disaggregation of corruption into its two forms: petty and grand. Of the 807 national surveys used to construct the overall corruption index, 769 contain information on grand corruption, with the 103 relevant questions divided into 11 dimensions related to grand corruption. Grand corruption is then converted to an index on a scale ranging from 0 to 100, but it has been rescaled so that higher numbers now indicate higher levels of related corruption. The average score for the Grand Corruption Index (Corruption3) is 49.4, with a notably wide range from a high of 89.1 (Democratic Republic of the Congo) to a low of 8.9 (Singapore).

The main independent variable is the aggregate economic freedom index from the Fraser Institute. This index is based on an unweighted average of five areas of freedom, each rescaled to a scale of 0 to 100, with higher numbers still denoting more freedom in that area: (1) Size of government; (2) Legal system and property rights; (3) Sound money; (4) Freedom to trade internationally; and (5) Regulation. The overall index ranges from a low of 0 to a high of 100, where higher numbers denote more overall economic freedom. In our sample, countries are on average more economically free with a score of 68.4, ranging from a high of 87.3 in Singapore and a low of 45.0 in Myanmar.

In addition to this widely used measure of economic freedom, we consider two alternate proxies of economic freedom specific to finance and trade. First, we consider a novel dimension of economic freedom based on the number of years since a central bank was established (Age of Central Bank). More established central banks, especially independent ones, are often associated with financial and monetary stability, which contribute to a well-functioning financial sector that facilitates capital mobility and commerce that align with greater economic freedom. Moreover, this also measures the historical inertia of economic freedom. Next, we consider an index of economic globalization. Economic globalization is an unweighted average of trade globalization (measured by trade in goods and services and trade partner diversity) and finance globalization (measured by foreign direct and portfolio investment, international debt, international services, international reserves, and international income payments).[8] Countries that are more economically open contribute to

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[7]Goel (2012) considers micro-level economic obstacles and how they might impact corruption.

[8]Many of these aspects of globalization are driven by the diffusion of the internet worldwide. Thus, economic globalization may be seen as a broader proxy for internet diffusion.

Table 3: List of Countries in the Sample

Algeria	Cote d'Ivoire	Jamaica	Peru
Argentina	Cyprus	Japan	Philippines
Australia	Denmark	Jordan	Poland
Austria	Dominican Republic	Kenya	Portugal
Bahamas, The	Ecuador	Korea, Rep.	Romania
Bangladesh	Egypt, Arab Rep.	Luxembourg	Rwanda
Barbados	El Salvador	Madagascar	Senegal
Belgium	Fiji	Malaysia	Sierra Leone
Belize	Finland	Mali	Singapore
Benin	France	Mauritius	South Africa
Bolivia	Gabon	Mexico	Spain
Botswana	Germany	Morocco	Sri Lanka
Brazil	Ghana	Myanmar	Sweden
Bulgaria	Greece	Namibia	Switzerland
Burundi	Guatemala	Nepal	Tanzania
Cameroon	Guinea-Bissau	Netherlands	Thailand
Canada	Guyana	New Zealand	Togo
Central African Republic	Haiti	Nicaragua	Tunisia
Chad	Honduras	Niger	Turkey
Chile	Hungary	Nigeria	Uganda
China	India	Norway	United Kingdom
Colombia	Indonesia	Pakistan	United States
Congo, Dem. Rep.	Ireland	Panama	Uruguay
Congo, Rep.	Israel	Papua New Guinea	Zambia
Costa Rica	Italy	Paraguay	Zimbabwe

N=100.

greater freedom in the trade of goods, services, and financial assets, making economic openness a good proxy for economic freedom. The correlation between the age of the central bank and economic freedom is 0.44, while the correlation between economic globalization and economic freedom is 0.81. These reasonably high correlations suggest that these measures may serve as proxies for economic freedom.

A cursory look at the data shows corruption, measured by Corruption Perceptions Index (Corruption1) and Overall Corruption Index (Corruption2), both of which are negatively correlated with Economic Freedom with a correlation coefficient of -0.78 and -0.64, respectively, which suggests an inverse relationship between corruption and economic freedom. Likewise, Corruption3 is negatively correlated with Economic Freedom with a correlation coefficient of -0.44.

The analysis below will control for other confounding effects and account for the possible simultaneity between economic freedom and corruption. Specifically, we consider several control variables that have been used extensively in the empirical literature (Aidt, 2003; Svensson, 2005; Lambsdorff, 2006; Serra, 2006; Treisman, 2007; Dimant and Tosato, 2018)—see Tables 1 and 2 for variable details. First, the log of real GDP per capita (lnGDP) accounts for the level of development, where countries with greater economic development have more checks and balances to control corruption (Capasso et al., 2019). Because of the potential bi-directional relationship between corruption and economic development we use the lag (average from 1990-1999) of the log of real GDP per capita (Goel and Saunoris, 2022). Democratic countries, rather than authoritarian countries, serve as a check on corruption given that citizens have the power to vote corrupt government officials out of office (see Halim, 2008). Furthermore, there may be spillovers from neighboring democratic countries, therefore, we account for this unique aspect by including Neighboring Democracy (see Starr, 1991). Because corruption occurs in the public sector, we account for the size of the public sector measured as government consumption as a percentage of GDP (Government Size).[9] Related to cultural influences, areas with greater Protestant populations that are less ethnically diverse (Ethnic Fractionalization) have been shown to have a lower incidence of corruption (see Paldam, 2002).

We also consider other potential influences that may distort the relationship between economic freedom and corruption. In particular, countries plagued by coup d'êtats may lead to costly uncertainties and open up new opportunities for corruption by currying favors with the potential new government. To account for this unique aspect, we include a variable that measures the number of unsuccessful and successful coup attempts

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[9]We address the potential overlap between economic freedom and government size as a robustness check in Section 3.2.3.

(Number of Coups). Former colonies may also influence the relationship between economic freedom and corruption as colonizers set up either extractive or non-extractive institutions (see Acemoglu and Robinson, 2012).

3 Empirical Model and Results

3.1 Empirical Model

Based on the above discussion and borrowing from the extant literature (e.g., Dimant and Tosato, 2018; Lambsdorff, 2006), to test our main hypothesis we estimate the following model:

$$Corruption_i^k = \beta_0 + \beta_1 EconomicFreedom_i^j + \gamma^{'} X_i + \epsilon_i \tag{1}$$

where subscript i indexes a country. The dependent variable is corruption indexed by k where k is the type of corruption (Corruption1, Corruption2, Corruption3); the main independent variable is economic freedom indexed by j where j is an overall index of economic freedom, index of economic globalization, and number of years since a central bank has been established; X is a vector of control variables including lnGDP, Democracy, Protestant, Ethnic Fractionalization, Government Size, and Neighboring Democracy; and ϵ is the random error term. Broadly speaking our estimated model is nested in the empirical determinants of corruption (Serra, 2006), with a focus on the effect of economic freedom.[10]

Greater economic freedom lowers corruption by reducing rent-seeking opportunities, while democracy captures political freedom. (Paldam, 2002) also argues that democracy captures the role of culture on corruption. GDP captures economic prosperity, with the underlying argument being that prosperous countries would have strengthened checks and balances against corruption and fewer incentives to pay and accept bribes. Protestant and Ethnic Fractionalization capture social aspects that can impact corruption (see Lambsdorff, 2006). Government size captures bureaucratic red tape (increasing corruption), while larger governments might also have better enforcement (decreasing corruption). Finally, spatial influences are considered by allowing for spillovers from democracy in neighboring countries. All these postulated relations could potentially vary across corruption types, an aspect we also touch upon.

To estimate equation (1) we use two-stage least squares estimation and instrument economic freedom using its lagged value measured as the average of its 1990 and 1995 values.[11] Lagged values of the endogenous variable are usually highly correlated with the contemporaneous endogenous variable, making them relevant instruments. Moreover, lagged values likely do not directly affect contemporaneous corruption, but rather influence it indirectly through inertial effects, making them valid instruments. In addition, we also include two other instruments to improve efficiency. First, we use a measure of genetic distance which measures the genetic distance between the country's ruling elite in year 1900 and the country's ethnic majority (see Dharmapala, 2021). Greater genetic distance may coincide with less economic freedom as the power of ruling elites increases government control and power (see Goel and Saunoris, 2022). Second, we include a measure of the geographic area of a country, where a larger geographic area is associated with greater difficulty for individuals to exit the country and less openness to trade, leading to lower overall economic freedom.[12]

To verify the relevancy (i.e., instruments are correlated with the endogenous variable) and validity (i.e., the instruments are excluded from the equation and not correlated with the error) of the instruments we report several diagnostic tests (Baum et al., 2007). First, the relevancy of the instruments is tested using the underidentification test under the null hypothesis that the instruments are correlated with the endogenous variable (Kleibergen and Paap, 2006). However, problems arise when the instruments are only weakly correlated with the endogenous variable, therefore, we also report the weak identification test under the null

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[10]The literature has considered numerous cross-country determinants of corruption (Serra, 2006; Treisman, 2007; Dimant and Tosato, 2018), although only a subset has been found to consistently impact corruption.

[11]Prior to 2000, the economic freedom index is measured every five years.

[12]Because land area may arguably have a direct effect on corruption, as a robustness check, we replaced land area with the length (in kilometers) of rail lines available for public passenger and freight services (see Goel et al., 2021), measured per capita, and re-estimated the baseline models in Table 4. These results confirm the robustness of our main findings and are available upon request from the authors.

hypothesis that the instruments are only weakly correlated with the endogenous variable. The Hansen J test for overidentification is reported as well under the null hypothesis that the instruments are valid.

3.2 Results

3.2.1 Baseline Models

Table 4: Economic Freedom and Corruption: Baseline Models

Dependent Variable:	(4.1) Corruption1	(4.2) Corruption2	(4.3) Corruption3
Economic Freedom	-1.715***	-0.999***	-1.916***
	(0.338)	(0.298)	(0.542)
lnGDP	-3.333	1.763	5.635*
	(2.034)	(1.881)	(3.186)
Government Size	-0.751***	-1.089***	-1.089***
	(0.272)	(0.209)	(0.348)
Democracy	5.336	2.125	11.65**
	(3.866)	(2.635)	(4.997)
Neighboring Democracy	3.504	-1.015	1.346
	(4.349)	(3.374)	(5.905)
Protestant	-0.127***	-0.00212	-0.0184
	(0.0479)	(0.0396)	(0.0700)
Ethnic Fractionalization	-2.959	2.659	-4.150
	(4.887)	(3.147)	(6.201)
Observations	98	100	100
R-squared	0.719	0.542	0.021
Overall F test	47.99***	21.45***	5.71***
	[0.000]	[0.000]	[0.000]
Variance Inflation Factor	2.29	2.29	2.29
Underidentification test	15.07***	15.07***	15.07***
	[0.002]	[0.002]	[0.002]
Weak Identification test	8.144	8.121	8.121
Overidentification test	1.579	1.859	2.296
	[0.454]	[0.395]	[0.317]

Notes: See Table 1 for variable definitions. Each model is estimated using two-stage least squares where Economic Freedom is instrumented using the lag of Economic Freedom (average of 1990 and 1995 values), Genetic Distance, and lnArea. A constant is included in each model but not reported. Robust standard errors are in parentheses and probability values are in brackets. Critical values for the Weak Identification test are in Stock and Yogo (2005). Asterisks denote statistical significance at the following levels: *** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$.

The baseline results are reported in Table 4. The diagnostic tests reported at the bottom of the table confirm the relevancy and the validity of the instruments given by the statistical significance of the underidentification test and the lack of statistical significance for the overidentification test. Furthermore, the overall F test shows statistical significance across all three models and the variance inflation factors are well below the threshold of 10, both results confirm the validity of the model.

Referring to the main findings, the coefficient on Economic Freedom is negative and highly statistically significant across all three models. This result confirms our main hypothesis that more economically free countries, on average, experience less corruption (Corruption1 and Corruption2) in general, and less grand corruption (Corruption3) specifically. In terms of magnitude, the elasticities are -2.21 (Model 4.1), -1.73 (Model 4.2), and -2.65 (Model 4.3). For example, an increase in economic freedom by ten points (equivalent to moving from Ghana's level of economic freedom to Portugal's level) would reduce grand corruption by 19 points (equivalent to moving from Zimbabwe's level of grand corruption to Switzerland's level). These results support the idea that greater economic freedom helps reduce corruption by limiting government intervention in the private sector, fostering competition, and promoting transparency and the rule of law. By reducing the discretionary authority of government officials, economic freedom narrows the scope of corrupt behavior.

Turning to the control variables, the negative and statistically significant coefficient on Government Size is consistent with, on average, larger governments devoting more resources to fight corruption rather than larger governments creating more bureaucratic obstacles. For example, less resource-constrained governments are better able to implement e-government mechanisms that enhance transparency and strengthen state capacity, such as establishing agencies to combat corruption. Interestingly, both lnGDP and Democracy show a positive and statistically significant effect on Corruption3, which suggest that more developed countries that are democratic tend to experience, on average, more grand corruption. The Protestant religion is effective at curbing overall corruption measured by Corruption1, but lacks any statistically significant effect on Corruption2 and Corruption 3. Finally, Democracy and Neighboring Democracy as well as Ethnic Fractionalization lack statistical significance once other factors are accounted for.

3.2.2 Additional Considerations

Former colonies might have economic ties to their colonizers that distort economic ties with other countries (non-colonizers), and coup attempts could distort institutions (tied to economic freedom or otherwise).[13] To account for these aspects, Table A1 includes two additional factors accounting for countries that are former colonies and those that experienced one or more coup attempts.

The results show that former colonies, on average, experience more corruption, while countries plagued by coups, on average, experience less corruption. However, both variables lack statistical significance when Corruption1 is the dependent variable. After accounting for these unique factors, the results confirm the baseline findings that economic freedom is inversely related to corruption. The control variables mostly match with the baseline findings with some small differences. For instance, lnGDP has an inverse relationship with Corruption1 in Model 5.2 and lnGDP is statistically insignificant in its effect on Corruption3 in Model 5.6 once Number of Coups is accounted for.

3.2.3 Considering Alternative Measures of Economic Freedom and Robustness Checks

Table A2 reports results using two alternative measures of economic freedom based on economic globalization and the age of the country's central bank. The use of alternative measures of economic freedom is informative since some studies have found that some aspects of economic freedom can have different effects on corruption in rich versus poor countries (Graeff and Mehlkop, 2003). Economic globalization can be seen as an indicator of economic freedom in terms of how effective it is, while the longevity of the central bank captures the legacy of financial institutions that can be instrumental in ensuring a level playing field, promoting freedom of trade and commerce. The use of the central bank's age appears novel in the context of corruption-economic freedom nexus.[14]

Consistent with our main hypothesis, the coefficients on Age of Central Bank and Economic Globalization are negative and statistically significant (except in Model 6.3 with Corruption2 as the dependent variable). These results confirm the inverse relationship between economic freedom, measured by the longevity of the central bank and degree of economic globalization, and corruption. The control variables show that lnGDP is inversely related to overall corruption measured by Corruption1 and Corruption2 (Models 6.1, 6.2, and 6.3), and positively related to Corruption3 (Model 6.6). Government Size lacks statistical significance in Models 6.1, 6.2, and 6.6). Democracy and Neighboring Democracy lack statistical significance across all six models. Different from the baseline findings, Protestant is negative and statistically significant in Model 6.6 when Corruption3 is the dependent variable, while Ethnic Fractionalization is positive and statistically significant in Model 6.4 when Corruption2 is the dependent variable.

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[13]Whereas we use colonial past as a dichotomous variable identifying countries that were former colonies, the duration or longevity of colonial rule might also matter, as shown by Feyrer and Sacerdote (2009).

[14]Somewhat related and broader measure is the independence of a country's central bank. This measure has been considered by other scholars (see Adrian et al., 2024) for a recent example). In the present case, it seems that the age of the central bank would be exogenous, while central bank independence could have a bi-directional relationship with corruption.One could also consider the subcomponents of the economic freedom indices, see for example, Goel and Nelson (2005); (also see Lawson et al., 2024). Re-estimating the models in Table 4 for each of the sub-components of economic freedom (legal system and property rights, sound money, freedom to trade internationally, and regulation) shows that all are negatively associated with corruption, except for sound money, which is insignificant in its effect on grand corruption (Corruption3). These results are available upon request from the authors.

We also consider the widely used measure of economic freedom from the Heritage Foundation (Economic Freedom2). This is also a composite index based on four categories of economic freedom including (1) Rule of Law; (2) Government Size; (3) Regulatory Efficiency; and (4) Open Markets. The index is on a scale from 0 to 100 with higher numbers signifying greater economic freedom. Using this measure in place of Economic Freedom in the baseline models, we re-estimate the models in Table 4 and report the results in Table A3. These results confirm the baseline results using this alternate measure of economic freedom. The coefficient on Economic Freedom2 is negative and statistically significant across all three measures of corruption. The control variables have similar influences with the exception that lnGDP is negative and statistically significant when Corruption1 is the dependent variable (Model 7.1) and statistically insignificant in the other two models.

Because of the inherent overlap in Government Size and Economic Freedom that may distort the relationship between economic freedom and corruption (Ott, 2018), we replace Government Size with central government employment measured as the civilian government administration as a percentage of the labor force and report the results in Table A4. These results, albeit with a smaller sample, confirm the baseline findings that economic freedom is inversely related to corruption. Most of the control variables lack statistical significance, except that Protestant is negative and statistically significant across all three models (see Lambsdorff, 2006) and Ethnic Fractionalization is positive and statistically significant in Model 8.2 when Corruption2 is the dependent variable.

As a separate robustness check, we drop Government Size altogether and report the results in Table A5. This is significant since some aspects of the size of the government likely impinge upon economic freedom.[15] Again, the results continue to show that economic freedom and corruption are inversely related.

4   Concluding Remarks

This study contributes to the empirical literature on the nexus between economic freedom and corruption in the consideration of different measures of economic freedom. The crux of the argument of the impact of economic freedom to (lower) corruption is that economic freedom, with less intrusive regulations and fewer bottlenecks, presents fewer opportunities for corrupt bureaucrats to garner rents. It is also possible, however, that in anticipation of rent-generation some economic barriers might be artificially erected. Our research accounts for these possible reverse feedbacks. There is now a quite active literature on the empirical determinants of corruption (Lambsdorff, 2006; Serra, 2006; Dimant and Tosato, 2018), and a subset of this research has considered the corruption-economic freedom nexus (Goel and Nelson, 2005; Swaleheen and Stansel, 2007; Carden and Verdon, 2010; Apergis et al., 2012). The contributions of the current work lies in consideration of alternative measures of economic freedom and corruption, a more recent dataset, and a rich set of countries to examine the economic freedom-corruption nexus.

Our empirical results across countries and accounting for possible reverse feedbacks, consistently show that greater economic freedom lowered corruption across alternative corruption measures. This is true when economic globalization and another measure of economic freedom (Economic Freedom2) are used as alternative indicators of economic freedom. However, when a hard proxy for economic freedom in the form of the age of the central bank (also capturing the longevity of economic institutions) is used, the negative effect on corruption holds, albeit with somewhat weaker statistical support. These findings are consistent with the notion that when economic freedom takes away regulatory bottlenecks, there are fewer corruption interactions due to an absence of rent-generating opportunities.

Larger government size lowered corruption, a finding consistent with better enforcement rather than with greater bureaucratic fat (see Rose-Ackerman, 1999 for related details). The influence of economic freedom on corruption, however, withstands the consideration of government size. The influences of democracy (including spatial democracy) and ethnic fractionalization did not significantly impact corrupt activities, although there was some support for more prosperous countries with a greater share of the Protestant population being less corrupt. These results are in line with earlier findings of Goel and Nelson (2005) who found economic freedom to be relatively more effective than political freedom in impacting corruption.

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[15]Dropping Government Size as a regressor also alleviates concerns about a possible two-way relation between corruption and the size of the government (Goel and Nelson, 1998).

Finally, former colonies were found to be more corrupt in a majority of the cases, while the reverse was true for countries experiencing more coups. The impact of coups was especially pronounced on grand corruption, and this finding seems novel. Another insight is that political institutions in the form of democracy are ineffective, but economic institutions in the form of the age of the central bank play a significant role.

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Appendix

Table A1: Economic Freedom and Corruption: Accounting for Additional Factors

	(5.1)	(5.2)	(5.3)	(5.4)	(5.5)	(5.6)
Dependent Variable:	Corruption1	Corruption1	Corruption2	Corruption2	Corruption3	Corruption3
Economic Freedom	-1.715***	-1.686***	-1.003***	-0.968***	-1.904***	-1.830***
	(0.345)	(0.323)	(0.311)	(0.274)	(0.570)	(0.471)
lnGDP	-2.862	-3.886*	2.544	1.041	6.637**	3.768
	(2.051)	(1.994)	(1.907)	(1.753)	(3.225)	(2.842)
Government Size	-0.686***	-0.782***	-0.980***	-1.130***	-0.916***	-1.191***
	(0.252)	(0.270)	(0.200)	(0.201)	(0.346)	(0.323)
Democracy	5.505	4.623	2.431	0.965	11.89**	8.676*
	(3.810)	(3.698)	(2.506)	(2.649)	(4.961)	(4.942)
Neighboring Democracy	3.449	3.923	-1.077	-0.295	1.574	3.155
	(4.291)	(4.381)	(3.193)	(3.261)	(5.598)	(5.313)
Protestant	-0.127***	-0.126***	-0.00100	0.000298	-0.0131	-0.0126
	(0.0465)	(0.0469)	(0.0356)	(0.0386)	(0.0640)	(0.0670)
Ethnic Fractionalization	-3.560	-2.655	1.389	3.241	-6.255	-2.652
	(4.958)	(4.789)	(3.185)	(2.939)	(6.234)	(5.265)
Former Colony	3.285		5.753***		9.071**	
	(2.801)		(1.941)		(3.534)	
Number of Coups		-1.478		-2.154*		-5.444***
		(1.288)		(1.137)		(2.056)
Observations	97	98	99	100	99	100
R-squared	0.721	0.727	0.568	0.573	0.076	0.158
Overall F test	44.76***	67.96***	22.74***	19.64***	7.16***	6.37***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Variance Inflation Factor	2.32	2.23	2.32	2.23	2.32	2.23
Underidentification test	14.99***	17.00***	15.03***	16.86***	15.03***	16.86***
	[0.002]	[0.001]	[0.002]	[0.001]	[0.002]	[0.0001]
Weak Identification test	8.103	10.08	8.083	10.02	8.083	10.02
Overidentification test	1.031	1.665	0.897	1.854	1.511	2.520
	[0.597]	[0.435]	[0.639]	[0.396]	[0.470]	[0.284]

Notes: See Table 1 for variable definitions. Each model is estimated using two-stage least squares where Economic Freedom is instrumented using the lag of Economic Freedom (average of 1990 and 1995 values), Genetic Distance, and lnArea. A constant is included in each model but not reported. Robust standard errors are in parentheses and probability values are in brackets. Critical values for the Weak Identification test are in Stock and Yogo (2005). Asterisks denote statistical significance at the following levels: *** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$.

Table A2: Economic Freedom and Corruption: Alternative Dimensions of Economic Freedom

Dependent Variable:	(6.1) Corruption1	(6.2) Corruption1	(6.3) Corruption2	(6.4) Corruption2	(6.5) Corruption3	(6.6) Corruption3
Age of Central Bank	-0.0375**		-0.0207		-0.0396*	
	(0.0188)		(0.0149)		(0.0238)	
Economic Globalization		-0.582***		-0.437***		-0.774***
		(0.124)		(0.0835)		(0.146)
lnGDP	-10.83***	-5.442***	-2.670*	1.419	-2.872	4.353*
	(1.884)	(2.016)	(1.468)	(1.468)	(2.591)	(2.242)
Government Size	-0.350	-0.0884	-0.865***	-0.654***	-0.661*	-0.296
	(0.274)	(0.256)	(0.229)	(0.194)	(0.374)	(0.356)
Democracy	-3.118	-4.360	-2.504	-3.156	2.770	1.572
	(4.131)	(3.099)	(2.804)	(2.386)	(5.276)	(4.230)
Neighboring Democracy	2.805	5.586	-1.551	0.508	0.314	3.886
	(4.330)	(4.570)	(3.320)	(3.130)	(5.113)	(5.425)
Protestant	-0.174***	-0.201***	-0.0311	-0.0493	-0.0740	-0.107*
	(0.0461)	(0.0466)	(0.0397)	(0.0373)	(0.0632)	(0.0640)
Ethnic Fractionalization	2.668	4.467	5.689	6.718**	1.663	3.505
	(5.476)	(5.082)	(3.487)	(3.176)	(5.457)	(5.589)
Observations	98	98	100	100	100	100
Estimation	OLS	2SLS	OLS	2SLS	OLS	2SLS
R-squared	0.728	0.753	0.585	0.637	0.286	0.311
Overall F test	76.46***	58.88***	28.29***	26.50***	8.68***	8.36***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Variance Inflation Factor	1.73	2.40	1.70	2.40	1.70	2.40
Underidentification test		27.98***		29.82***		29.82***
		[0.000]		[0.000]		[0.000]
Weak Identification test		63.84		67.81		67.81
Overidentification test		2.485		1.603		2.866
		[0.289]		[0.449]		[0.239]

Notes: See Table 1 for variable definitions. Economic Globalization is instrumented using the lag of Economic Globalization (average of 1990 and 1995 values), Genetic Distance, and lnArea. Robust standard errors are in parentheses and probability values are in brackets. A constant is included in each model but not reported. Critical values for the Weak Identification test are in Stock and Yogo (2005). Asterisks denote statistical significance at the following levels: *** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$.

Table A3: Economic Freedom and Corruption: Robustness Check-Using an Alternative Measure of Economic Freedom

Dependent Variable:	(7.1) Corruption1	(7.2) Corruption2	(7.3) Corruption3
Economic Freedom2	-1.143***	-0.541***	-0.834**
	(0.188)	(0.192)	(0.358)
lnGDP	-4.485***	0.255	1.551
	(1.686)	(1.732)	(2.660)
Government Size	-0.649***	-1.026***	-0.938***
	(0.206)	(0.198)	(0.311)
Democracy	0.290	-0.959	5.044
	(2.609)	(2.344)	(4.426)
Neighboring Democracy	-0.372	-3.301	-2.697
	(3.513)	(2.963)	(4.599)
Protestant	-0.145***	-0.0119	-0.0445
	(0.0412)	(0.0398)	(0.0663)
Ethnic Fractionalization	0.0107	4.522	-0.0880
	(4.138)	(2.930)	(4.972)
Observations	97	99	99
R-squared	0.837	0.651	0.389
Overall F test	78.69***	25.14***	5.89***
	[0.000]	[0.000]	[0.000]
Variance Inflation Factor	2.13	2.13	2.13
Underidentification test	20.30***	20.32***	20.32***
	[0.000]	[0.000]	[0.000]
Weak Identification test	24.63	24.24	24.24
Overidentification test	5.265*	4.393	7.142
	[0.072]	[0.111]	[0.028]

Notes: See Table 1 for variable definitions. Each model is estimated using two-stage least squares where Economic Freedom is instrumented using the lag of Economic Freedom (average of 1990 and 1995 values), Genetic Distance, and lnArea. A constant is included in each model but not reported. Robust standard errors are in parentheses and probability values are in brackets. Critical values for the Weak Identification test are in Stock and Yogo (2005). Asterisks denote statistical significance at the following levels: *** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$.

Table A4: Economic Freedom and Corruption: Robustness Check-Using an Alternative Measure of Government Size

Dependent Variable:	(8.1) Corruption1	(8.2) Corruption2	(8.3) Corruption3
Economic Freedom	-1.812***	-0.678*	-1.707***
	(0.424)	(0.364)	(0.622)
lnGDP	-2.498	0.360	5.266
	(3.033)	(2.710)	(3.849)
Government Employment	-0.507	-0.474	-0.723
	(0.585)	(0.351)	(0.473)
Democracy	4.413	-2.152	6.724
	(4.104)	(3.030)	(5.931)
Neighboring Democracy	3.889	-0.596	5.089
	(4.847)	(3.385)	(6.291)
Protestant	-0.183***	-0.0970***	-0.109*
	(0.0412)	(0.0350)	(0.0610)
Ethnic Fractionalization	4.461	6.743*	4.029
	(5.186)	(3.996)	(7.114)
Observations	79	80	80
R-squared	0.733	0.543	0.076
Overall F test	39.96***	11.32**	3.59***
	[0.000]	[0.000]	[0.002]
Variance Inflation Factor	2.50	2.50	2.50
Underidentification test	9.999**	9.733**	9.733**
	[0.019]	[0.021]	[0.021]
Weak Identification test	5.320	5.308	5.308
Overidentification test	0.327	2.877	1.862
	[0.849]	[0.237]	[0.394]

Notes: See Table 1 for variable definitions. Each model is estimated using two-stage least squares where Economic Freedom is instrumented using the lag of Economic Freedom (average of 1990 and 1995 values), Genetic Distance, and lnArea. A constant is included in each model but not reported. Robust standard errors are in parentheses and probability values are in brackets. Critical values for the Weak Identification test are in Stock and Yogo (2005). Asterisks denote statistical significance at the following levels: *** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$.

Table A5: Economic Freedom and Corruption: Robustness Check-Dropping Government Size

	(9.1)	(9.2)	(9.3)
Dependent Variable:	Corruption1	Corruption2	Corruption3
Economic Freedom	-1.556***	-0.784**	-1.698***
	(0.342)	(0.332)	(0.545)
lnGDP	-5.107**	-0.789	3.066
	(2.022)	(2.063)	(3.047)
Government Size	——	——	——
	——	——	——
Democracy	4.005	0.554	10.06**
	(3.948)	(2.841)	(4.738)
Neighboring Democracy	4.973	0.889	3.245
	(4.296)	(3.461)	(5.788)
Protestant	-0.172***	-0.0690*	-0.0854
	(0.0434)	(0.0404)	(0.0671)
Ethnic Fractionalization	0.434	7.206*	0.408
	(4.682)	(3.896)	(6.346)
Observations	98	100	100
R-squared	0.720	0.473	0.028
Overall F test	42.26***	11.51**	3.73***
	[0.000]	[0.000]	[0.002]
Variance Inflation Factor	2.30	2.30	2.30
Underidentification test	14.90***	14.99***	14.99***
	[0.002]	[0.002]	[0.002]
Weak Identification test	8.608	8.558	8.558
Overidentification test	2.497	2.802	3.342
	[0.287]	[0.246]	[0.188]

 Notes: See Table 1 for variable definitions. Each model is estimated using two-stage least squares where Economic Freedom is instrumented using the lag of Economic Freedom (average of 1990 and 1995 values), Genetic Distance, and lnArea. A constant is included in each model but not reported. Robust standard errors are in parentheses and probability values are in brackets. Critical values for the Weak Identification test are in Stock and Yogo (2005). Asterisks denote statistical significance at the following levels: *** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$.