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ABSTRACT

Many studies examining whether corruption lowers economic growth do not consider if the effects of corruption differ across countries. Whether corruption produces the same effects everywhere or whether its effects are conditional on some country characteristics is an important question. We investigate the association between corruption and growth, where the marginal impact of corruption is allowed to differ across democratic and non democratic regimes. Using cross-country, annual data from 1984 to 2007, we regress growth on corruption, democracy, and their interaction. We find that decreases in corruption raise growth but more so in authoritarian regimes. Possible reasons are in autocracies corruption causes more uncertainty, is of a more pernicious nature, or is less substitutable with other forms of rent seeking.

1. Introduction

Understanding the vast differences in income levels and economic growth rates has attracted much attention, developing many explanations for these differences. Many see these differences stemming from institutional causes as some institutions provide incentives for productive activities whereas others lead to rent seeking.[1] One example of rent seeking is corruption where public officials abuse their power in order to extract payments from firms. Such abuse commonly results in personal gain for those in command at the expense of the populace (World Bank, 1997). Since such practices dissuade productive activities, they have the potential to lower growth (Svensson, 2005).

Corruption has not always been viewed negatively. Earlier studies considered corruption as pro-growth because it allowed firms to avoid distortions caused by government failures. Corruption was seen as "speed up" money that facilitated productive

[1] See North (1990), Hall and Jones (1999), and Acemoglu, Johnson, Robinson (2001) for examples and surveys of this literature.

activities (Leff, 1964; Huntington, 1968 and Aidt, 2003). However, in recent years, most views now see corruption as lowering growth (Shleifer and Vishny, 1993; Mo, 1991; Mauro, 1995; and Svensson, 2005), at least for some subset of countries.

We also consider the effects of corruption upon economic growth but we allow the effects of corruption to differ across political regimes. Corruption might affect economic growth differently in democracies relative to autocracies as we explain in section three. Past researchers have also considered links between political regime and corruption. However, such research has often considered whether democratization leads to more or less corruption (see section two for examples). Instead, we consider whether the type of political regime influences the effects of corruption upon economic growth.

The rest of the paper is organized as follows. Section 2 presents an overview of the different studies on corruption, democracy and economic growth. Section 3 provides more details as to how the type of political regime can influence the effects of corruption upon economic growth. Data for our study is described in section 4. Section 5 then presents the empirical model. Section 6 shows results. Section 7 concludes the paper by providing policy suggestions based on our findings.

2. Literature Review

Economists and political scientists have long debated how corruption affects economic growth. Leff (1964) and Huntington (1968) argue that corruption might enhance growth for two reasons. First, it might be used as "speed money" that allows agents to avoid delays due to bureaucratic red tape. It "greases the wheels". Second, corrupt employees might work harder because bribes create incentives for greater work

effort. On the other hand, Tanzi and Davoodi (2000) view corruption as lowering growth.[1] Mauro (1995) explains the lower growth through corruption's negative effect on investment. Mo (1991) sees corruption as lowering growth through less political stability. In addition to growth, Gupta, Davoodi, and Alonso-Terme (1998) affirm that higher levels of corruption increase income inequality and poverty.[2] To the extent that corruption harms growth, then this is most problematic in developing countries as corruption is most pervasive in developing regions (Svensson, 2005).

Beginning with Mauro (1995), early empirical work examining the effects of corruption upon growth or investment regress one of these measures on a corruption index and various controls. However, more recent literature allows for the effects of corruption to differ depending upon various country characteristics. Méon and Sekkat (2005) consider a cross-section of countries and allow corruption to affect growth differently in good governance versus bad governance countries. They find that corruption lowers growth but by a lesser extent in good governance countries. However, using an empirical specification that accounts for threshold effects Aidt et al. (2008) report that corruption lowers growth in countries with high quality institutions but does not affect growth in countries with low quality institutions. Méon and Weill (2010) consider a stochastic frontier model and report that corruption lowers efficiency less in countries with poor institutions. Swaleheen and Stansel (2007) explore whether the extent

[1] See also Knack & Keefer (1995), Ades & Di Tella (1999), Triesman (2000), Mauro (1998), Shleifer and Vishny (1993).

[2] The conventional wisdom among the public is that corruption is anti-growth (see Lambert-Mogiliansky, Majumdar and Radner, 2007). According to the World Bank, corruption is the greatest obstacle to effective social and economic development (Akai, Horiuchi, & Sakata, 2005).

of economic freedom alters the relationship between corruption and growth. Utilizing a panel specification, they find that corruption raises economic growth in countries with high economic freedom, while corruption lowers growth in countries with low levels of economic freedom.

In a study most related to ours, Méndez and Sepúlveda (2006) also consider whether the effects of corruption upon economic growth differ between democracies and autocracies. For both a cross section and a panel using five-year windows, they split their sample into free and not-free regimes based upon the Freedom House classification and run separate regressions for each. For free countries, a nonmonotonic association between corruption and growth is found. Corruption first increases growth and then further levels of corruption decrease it. No strong association between corruption and growth is found for the not-free group. However, we find some concerns in their methodology. For one, they use the standard indices to measure corruption but these indices are ordinal measures. Taking their square to fit a quadratic relationship might not be appropriate.[1] Second, countries can move from one group to the other as democratic reforms occur or as coups undercut democracies. Yet, running separate regressions does not directly take into account this transitioning from one group to the other. Instead, a country that is free in one five-year window but not free in another five-year window is treated as distinct observations. Such an approach can describe differences in the associations between corruption and growth across political regimes, but they do not directly address what happens to this association *within* a country when that country undergoes political

[1] Of course, one might also argue that as ordinal measures any inclusion of such indices in a growth regression is not appropriate.

change. Third, using fixed effects can mitigate some forms of endogeneity as time-invariant factors affecting both corruption and growth are implicitly captured. Nevertheless, it does not address concerns that growth causes corruption or that time-varying factors influence growth, political freedom, and corruption. To address some of these concerns, we employ a panel dataset where countries are allowed to switch from a nondemocratic to a democratic regime and so we can better exploit the within country variation in the sample. In fact, we believe this is most relevant in examining the effects of corruption upon growth since one often wants to know how a change in the level of corruption affects subsequent growth rates. We also employ dynamic GMM estimation methodologies as robustness checks to better address concerns of endogeneity.

Our study also builds upon past research that examines associations between democracy and growth, albeit with little consensus. Some studies such as Levine and Renelt (1992) and Alesina et al (1996) find no direct relationship between growth and democracy. In contrast, Barro (1996) asserts a non-linear relationship between the two. At low levels of democracy the effects upon growth are positive while at higher levels of democracy the association among the two becomes negative. Wacziarg and Tavares (2001) considered several channels through which democratization could affect growth: human capital, physical capital, income inequality, openness, etc. Although some channels had positive associations and some negative ones, the total effect upon growth was small. More recent work, however, such as Papaioannou and Siourounis (2008), Rodrik and Wacziarg (2005) and Giavazzi and Tabellini (2005) employ panel techniques and do find that democratization raises economic growth.

3. Economic Framework

In this section we proffer various reasons why the effects of corruption could differ depending upon political regime. Although most of these explanations predict that lowering corruption should have more positive effects upon growth in autocracies, not all of them do and so how the political regime influences the effect of corruption upon growth is a priori unclear.

The first possibility recognizes that corruption is a form of rent seeking but not the only type. Svensson (2005) defines rent seeking as "the socially costly pursuit of rents, often created by governmental interventions in the economy".[1] Murphy, Shleifer and Vishny (1993) divide rent seeking into (illegal) corruption and (legal) lobbying[2]. Past work on rent seeking often differentiates corruption from lobbying based on who is being influenced. While corruption is often associated with money given to policy enforcers, lobbying is usually associated with political campaign activities or other practices that aim to influence decision makers as they enact policies (Campos and Giovannoni, 2008). Harstad and Svensson (2006, 2010) see these two types of rent seeking as at least partially substitutable. They suggest that a firm could switch the rules through lobbying while through bribery it could bend the rules. Firms that successfully lobby the government to change the rules then need not bribe officials to bend them (as long as an official would never file a false accusation so as to extort a bribe from the

[1] Rent seeking lowers social welfare because of misallocation of scarce resources in pursuing redistributive outcomes that are not socially optimal. For a detailed discussion on the effects of rent-seeking on economic outcomes see Krueger (1974), Olson (1982), Bhagwati (1982), Murphy et al. (1993) and Lambsdorff (2002). Also, North (1990) argues that rent–seeking lowers growth.

[2] Of course, what is a legal activity in one country need not be legal in others.

firm). On the other hand, firms that can easily bribe officials might not then lobby for a change in the rules, especially if the outcomes of such attempts are greatly uncertain.

Since we consider lobbying as targeted towards decision makers (representatives/MPs) whereas corruption is targeted toward bureaucrats that enforce the rules, the aforementioned substitutability between corruption and lobbying might not be identical across countries. If opportunities for lobbying are less available in authoritarian regimes with fewer decision makers, then the degree of substitutability between the two is lower in these countries. Perhaps lowering corruption in authoritarian regimes could have greater benefits for economic growth because of the lower substitutability between corruption and lobbying in these countries.

A second reason focuses upon the type of corruption. Assume that democracies are more transparent than are authoritarian regimes due to freedom of the press. Assume that corruption exists in both types of regimes. However, the corruption that exists in democracies could be more benign since corrupt activities that greatly hurt the majority are more likely to be reported and combated. This is not to say that the frequency of corrupt activities is lower in democracies, only that its detrimental effects are smaller.[1] Therefore, a fall in corruption in an authoritarian regime could then have a more positive effect upon economic growth than in a democratic regime. Moreover, if such types of corruption in democratic regimes are so "benign" that bribes act as speed money, then combating such corruption could even lower economic growth.

[1] Ideally, country-level measures of corruption would not only account for the frequency of corrupt activities but also for their severity so that they implicitly capture such distinctions across countries. However, given the inherent measurement problems in quantifying corruption it is likely that such considerations are not captured perfectly, especially if observers put greater focus on the frequency of corrupt activities.

A third reason centers upon the uncertainty that corruption creates.[1] Consider a firm that must interact with bureaucrats to acquire various permits or is subject to regulators assessing if the firm complies with legal codes. With no corruption, the amount of bribe is certain since it is zero by definition, but the amount of bribe that a corrupt official would charge could be a priori uncertain. This uncertainty could be greater under autocracies where the "rules of the game" could more greatly change from regime to regime. Regulations certainly change when democratic administrations change, but the process is often less capricious and more transparent than when regimes change in autocracies. Therefore, if corruption does, indeed, create greater uncertainty in autocracies and if this uncertainty is growth retarding then lowering corruption will have more positive effects upon economic growth in autocracies.

A fourth reason comes from the potential for growth outcomes to be more extreme in autocracies.[2] Zakaria (2003) notes that benevolent autocracies often grow faster than do democracies whereas kleptocracies and tyrannies often grow slower. Democracies might not generally provide spectacular growth booms but they do not create growth disasters either. This suggests that the distribution of growth rates under democracies is a subset of growth outcomes under autocracies. If so, then the decrease of corruption in an autocracy can have greater growth effects because there is more potential for growth outcomes to improve as the country transitions from what Zakaria might call a "bad autocracy" to a "good" one.

[1] Campos and Pradhan (1999) consider how uncertainty stemming from corruption affects investment.

[2] Besley and Kudamatsu (2007) develop a theory that address why growth outcomes are favorable under some autocracies but dismal under others.

All of the above reasons predict that decreasing corruption has more positive effects upon economic growth in autocracies. The final possibility predicts the opposite. Murphy, Shleifer, and Vishny (1993) argue that centralized corruption reduces income less than does decentralized corruption because of a "tragedy of the commons." A dishonest official wants to extract the highest bribe possible without driving a firm out of business thereby killing the goose laying the golden egg. But if corruption is decentralized with numerous officials demanding bribes, each official demanding a bribe and taking the others' actions as given is less likely to account for the possibility of driving firms out of business. As a group, bureaucrats set total bribe amounts too high and so drive firms out of business (or at least into informal sectors of the economy). A centralized bureaucracy operating like a monopolist will take this consideration into account. Therefore, corruption under centralized systems is likely to reduce income less. Given that democracies often incorporate greater checks and balances resulting in less centralized concentrations of power, then "corruption regimes" could be less centralized under democracies. Decreases in corruption should then have greater growth effects in democracies.

The empirical work below will consider if the positive effects of reducing corruption upon economic growth are greater in autocracies. If so, one of the first four explanations could be true. Unfortunately, however, our empirical work does not distinguish among them. If reducing corruption is more growth enhancing in democracies, then only the final explanation is supported.

4. Description of the Data and Descriptive Statistics

We use annual data from 119 countries from 1984 to 2007. Past research such as Ehrlich and Lui (1999) and Méndez and Sepúlveda (2006) consider multiyear windows (such as five-year windows) so as to better focus on growth phenomenon as opposed to business cycle movements. On the other hand, Giavazzi and Tabellini (2005) and Papaioannou and Siourounis (2008) use annual data to better pinpoint regime changes. We follow this approach although we will also use five-year averages as a robustness check.[1]

GDP per capita (GDP and GROWTH), the share of government expenditures in GDP (GOV), and the investment share of GDP (INV) are taken from the Penn World Tables, version 6.3. Annual population growth (GPOP) and life expectancy at birth (LIFE) are from the World Bank`s *2009 World Development Indicators*.

Democracy (DEM) is measured using the Freedom House indices. The Freedom House data begins in 1972. The two indices consider two components of political freedom. The political rights index measures the extent of free and fair elections, political pluralism and the rights of political minorities. The civil liberties index measures individual liberties such as the freedoms of speech, to practice one's religion, and to peaceably assemble. Both indices range from one to seven where lower numbers indicate higher levels of freedom. To derive DEM, we first take the average of these two indices. We then rescale this average, transforming it from a one to seven interval to a six to zero

[1] See Attanasio et al. (2000) for a discussion of window length in panel data growth regressions.

interval so that higher values of DEM denote more democratic freedoms.[1] As a robustness check, we also consider the Polity measure of democracy which follows a -10 to 10 range with higher values denoting stronger democracies. The Polity indicator builds upon the following components: competitiveness of political participation, competitiveness and openness of executive recruitment, and constraints on the chief executive (See Marshall and Jaeggers, 2004 for more details).

In addition to using these indices, we consider the binary variable from Papaioannou and Siourounis (2008). They consider the Freedom House and Polity measures, but they also consider other factors in assigning countries as democracies or not. They create a dummy variable, DEM_PS, that takes the value one for a democracy and zero otherwise.[2] In their classification system, a country is only considered to have democratized if that democratization was sustained and so did not revert back to authoritarianism. Therefore, once DEM_PS becomes "one" it retains this value throughout the remainder of the sample period.[3,4]

[1] Even though the Freedom House index is commonly used in empirical studies, it still has components that are not exactly measures of democracy. For instance, the power of the citizenry to exercise the right to own property, to make free economic resource-allocation decisions and to enjoy the fruits of such decisions are all included (Gastil, 1989). Another potential problem recognized by Barro (1996) rises from the fact that the Gastil indicator is an ordinal variable and not a cardinal one.

[2] They divide the set of democracies into both full and partial subgroups. As in their main specifications, DEM_PS equals one for either type of democracy and zero for nondemocratic countries. Papaioannou and Siourounis (2008) also classify borderline cases (such as Iran and Niger) and reversals (such as Lebanon and Zimbabwe) where countries went from democracies to authoritarian regimes. Our results are robust to adding the borderline cases to our set of democracies; to removing the reversals from the specification; and to allowing DEM_PS to go from one to zero for the countries classified as "reversals".

[3] Unlike the indices of democracy mentioned above, Gerring et al. (2005) consider democracy as a stock variable and so their variable takes on larger values the longer a country remains democratic.

[4] Their dataset ends in 2003. Therefore, to extend DEM_PS to 2007, we follow their methodology. In addition, we removed Thailand from their set of countries that democratized given the events of 2007.

The use of a binary variable has the advantage that it better captures a change from nondemocracy to democracy since countries can only fall into one of two groups. That is, the democracy must be sustained and so The Gambia, for example, which had been a democracy until 1994 when it became authoritarian is not coded as democratic **prior** to 1994. The Freedom House measures do not impose such restrictions and so they also capture democracies that were not sustained as well as transitions from democracy to autocracy. In addition to the Freedom House, the Polity IV [POLITY] index has been widely used as a measure of political institutions. Given the benefits of each measure, we will employ all three in the below specifications.

The corruption index comes from Political Risk Services, a private firm that annually publishes the International Country Risk Guide (ICRG). This index is based on the opinion of experts and captures the degree to which "high government officials are likely to demand special payments" and to which "illegal payments are generally expected throughout lower levels of government in the form of bribes connected with import and export licenses, exchange controls, tax assessments, police protection, or loans." ICRG classifies countries on a scale from 0 to 6, with 6 indicating low levels of corruption. We use the ICRG data since it is available for more years than other measures of corruption. Nevertheless, as an alternative measure for corruption, we consider the corruption indicator from the World Bank's World Governance Indicators (WGI) constructed by Kaufmann et al. (1999). Although it only begins in 1996, it is available for more countries than is the ICRG measure. The WGI corruption index ranges from -2.5 to +2.5 where higher numbers denote a better control of corruption. We also use the Corruption Perception Index from Transparency International (CPI) to check for the

robustness of our findings. The CPI is available from 1995 and ranges from 0 to 10 with lower numbers indicating high levels of corruption.

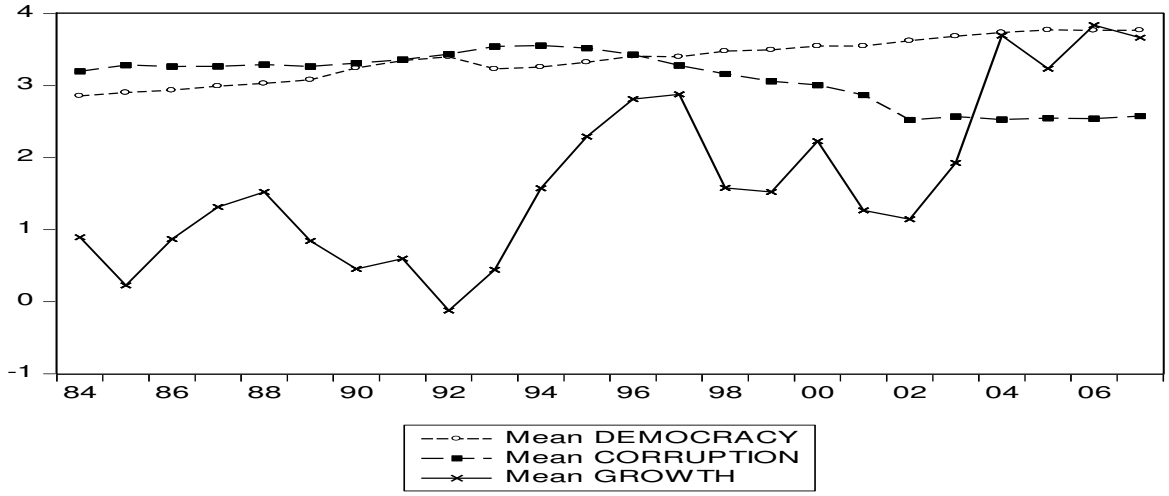
Democratization often accompanies economic reforms and not controlling for these could bias upward the estimated effects of democracy upon economic growth. Therefore, as a robustness check, we control for economic reforms utilizing the classification developed by Sachs and Warner (1995) and updated by Wacziarg and Welch (2003). For countries with open trade policies, the variable REFORM takes the value one. REFORM equals zero for countries with sufficiently high trade barriers.[1] Like Giavazzi and Tabellini (2005), we presume that REFORM is associated with more widespread liberalizations within the country. As countries liberalize, REFORM goes from zero to one.

The appendix provides further details regarding the source and the definition of these variables. It also lists our sample countries. Table 1 Panel A presents descriptive statistics. Table 1 Panel B provides correlations between the key variables in our study. The growth rate of real GDP per capita shows significant variation between 88.74 to -64.36 as outliers are clearly present. We remove these countries from our specification to better estimate coefficients applicable to the majority of countries but the results are very similar once we include them in our sample. The bottom panel shows correlations. We observe no strong association between democracy and growth or between corruption and growth. On the other hand, corruption and democracy are significantly correlated.

[1] REFORM is constructed based on five criteria. A country is considered closed as long as one of the following criteria holds: (1) average tariff rates are higher than 40%, (2) nontariff barriers covered on average more than 40% of imports, (3) it has a socialist economic system, (4) it has a state monopoly of major exports, and (5) the black market premium exceeded 20%.

However, these correlations do not necessarily imply causal links (or the lack thereof). The next two sections more deeply consider these potential links. Finally, figure 1 shows how the cross-country averages of these variables have evolved over time.

Figure 1. Mean Democracy, Corruption, Growth (1984 – 2007)



5. Methodology

5.1 The Model

We employ panel data techniques in order to capture the within country variation within the data. Consider the following empirical specification which we adapt from Ehrlich and Lui (1999), using many of their same control variables:

$$Y_{i,t} = \alpha_i + \eta_t + \delta(CO)_{it} + \zeta(DEM)_{it} + \theta(CO \times DEM)_{it} + \mathbf{X}'_{i,t-1}\boldsymbol{\Gamma} + \varepsilon_{i,t} \quad (1)$$

where i,t denote country and time respectively. $Y_{i,t}$ is the log growth rate of annual real GDP per capita adjusted for PPP, for the ith country in year t. The intercepts α_i and η_t indicate country and year fixed effects in order to control for time invariant factors specific to a country as well as global shocks that influence all countries similarly. DEM is the Freedom House democracy index, CO is the ICRG control of corruption index, and

DEM×CO is the interaction term between them. The vector X will initially be empty but later contain control variables such as the lag of the natural log of GDP per capita (GDP), the population growth rate (GPOP) as well as government purchases, investment and trade. Finally, ε denotes the error term where E (ε_{it}) = 0 for all i and t.

5.2 Potential endogeneity

Potential endogeneity problems are present in the above empirical framework. Previous studies considered both corruption and democracy as endogenous variables.[1] Haque and Kneller (2005) find two-way causality between corruption and economic development due to the existence of threshold effects and multiple equilibria, explaining why the level of corruption varies across countries. Blackburn, Bose and Haque (2002) also see development (i.e. growth) as affecting corruption. Using a theoretical model, they find that low development regimes are characterized with high incidents of corruption while high development regimes are characterized with low incidents of corruption. Recent empirical studies have considered instruments to address these concerns, such as using ethnolinguistic fractionalization to instrument for corruption in a growth regression as did Mauro (1995). However, Easterly and Levine (1997) posit that ethnic diversity has direct effects on growth, and so is perhaps not a suitable instrument for corruption.[2] The use of fixed effects, though, in our model lessens endogeneity concerns because historical factors that influence growth, democracy, and corruption are all implicitly captured by the fixed effects. Of course, fixed effects do not resolve these

[1]See Aidt, Dutta and Sena (2007), Ehrlich and Lui (1999), Ades and Di Tella (1999) and Kauffman and Wei (2000) for examples where corruption is endogenous.

[2] Moreover, this instrument or others such as legal origin that have been used in the past are not useful for our purposes since they do not vary over time.

issues and so we will also estimate (1) using difference-GMM estimation techniques. Nevertheless, in the remainder of this section we provide other evidence as to why democracy and corruption can be seen as exogenous in our specification.

Acemoglu, Johnson, Robinson and Yared (2008) [AJRY] argue that income does not lead to democratization. We consider a panel specification similar to theirs:

$$DEM_{it} = \beta_{0i} + \beta_{1t} + \beta_2 DEM_{it-1} + \beta_3 GDP_{it-1} + \varepsilon_{it} \quad (2)$$

where i,t denote country and time respectively. The dependent variable is the Freedom House political rights index.

From column 1 of table 2, the coefficient estimate of β_3 suggests that lagged income is insignificant. This implies that income does not cause democratization once we control for time and country fixed effects (AJRY, 2008). Faster growing countries do not appear to be the ones becoming democratic. We perform a similar specification but we replace DEM with the control of corruption (CO) in column 2. Again, the results suggest that income does not cause corruption. These results are not panaceas for alleviating endogneity concerns but they do provide some indication that increases in income are not driving democratization or the control of corruption.

Murtin and Wacziarg (2011) take issue with the above approach in that fixed effects are ill-suited to test for whether income causes democracy as the bias due to measurement error in fixed effects models with persistent variables can lead to large biases in the coefficient estimates. They instead estimate (2) by system-GMM since they argue that difference-GMM suffers from weak instruments. Columns (3) and (4) of Table 2 show results of this system-GMM estimation using two lags of the endogenous

variables as instruments. As before, no evidence arises that income causes democracy or the control of corruption (although the specification in column (4) might be inappropriate due the presence of second order serial correlation.)

Unfortunately, other endogeneity concerns also arise. Several papers have considered how democracy affects corruption. Musila (2007) suggests that authoritarian countries are less prone to corruption than countries at intermediate levels of democracy, and, that beyond the threshold level of democracy, more democratic countries are less prone to corruption. Shen and Williamson (2005) suggest that democracy has a positive effect on the perceived level of corruption control. Ali and Isse (2003) also present evidence that political freedom and transparency are positively correlated with corruption control. Conversely, Ehrlich and Lui (1999) affirm that autocratic regimes could achieve growth rates equal to or higher than decentralized democracies because corruption is more constrained in the autocracies.[1] Rivera-Batiz (2002), using a theoretical model, shows that stronger democratic institutions influence governance by constraining the actions of corrupt executives.

In contrast, our work does not consider democracy as a causal factor of corruption. To help show that democracy does not systematically cause corruption (or the lack thereof) we disaggregate countries into two groups, presented in Table 3. Group A consists of countries that were always autocratic throughout our sample period. Group B consists of countries that were initially autocratic but experienced some form of democratization (as determined by Papaioannou and Siourounis [2008]) within our

[1] See also Rock (2008) where he claims an inverted U relationship between the age of democracy and corruption.

sample period. We then take the average change in corruption for each group[1]. For the countries remaining autocratic, CO increased by 1.18 on average. For the second group, CO increased a nearly identical 1.28 points. Therefore, the countries that democratized during the sample period did not see large distinctions in the degree of corruption compared to those countries that remained autocratic.

We also list all the countries that democratized during our sample period in Table 4. For each country, we provide the average corruption score for the five years before and after democratization (or for fewer years for the countries where data is not available). For some countries the corruption score went up, for others down, and for others it stayed the same. Therefore, no clear pattern emerges between democratization and changes in corruption.

Taking a step further we separate all the countries that democratized during our sample period into the five categories listed below: a) countries where the corruption index increased by more than one, b) countries where the corruption index increased but by less than one, c) countries where the corruption index decreased by more than one, d) countries where the corruption index decreased but by less than one and e) countries where the corruption index remained the same. Panel B of Table 3 indicates that democratization does not appear to have a "common" effect on corruption across the sample. Ideally, we would hope to see that corruption does not change at all after democratization and so all countries fell into group (e). However, we believe that the above frequency breakdown leads to the next best outcome -- no clear relation between

[1] For each country we find the difference in corruption between the first year and the last year in our sample period. Then, we obtain the value of the total average change in corruption for each group.

democratization and corruption -- which supports (to some extent) our view that democratization is generally not a causal factor of corruption.[1]

5.3 *Robustness Checks*

An additional step towards addressing endogeneity is the use of dynamic GMM estimation techniques. The specification to be estimated is of the form:

$$GDP_{i,t} = \alpha_i + \eta_t + \zeta GDP_{i,t-1} + \theta X_{i,t} + \varepsilon_{i,t} \quad (3)$$

It is a dynamic panel specification where $GDP_{i,t}$ is the real per capita income. X denotes the possibly endogenous variables of DEM, CO, and their interaction. We then take the first difference of (3) to arrive at the growth rate. Because of the potential endogeneity of DEM and CO, we first estimate (3) using the difference estimator of Arellano and Bond (1991) using the second lag of the endogenous variables as instruments. For these specifications, we use a Sargan test to examine whether these instruments are valid. A key assumption is that ε is not serially correlated and so we also test the residual for first and second order serial correlation. As shown below, neither the null hypothesis of valid instruments nor the null hypothesis of no second order serial correlation is rejected.

In addition, we also estimate (3) using the system-GMM estimator from Arellano & Bover (1995) and Blundell & Bond (1998) which improves on the Arellano & Bond (1991) difference GMM estimator. In the case of persistent explanatory variables (which is likely to be the case for our variables), Bond, Hoeffler and Temple (2001) suggest that

[1] Treisman (2000) finds that corruption is lower in long-standing democracies but recent democracies are not associated with lower corruption. Presumably, our fixed effects model can capture historical conditions promoting *persistent* democracy and low corruption. On the other hand, recent moves to democracy -- and so ones not captured by the fixed effects -- do not seem to lower corruption. See also Billger and Goel (2009) where they explore the determinants of corruption using quantile regressions. They find that democracy lowers corruption but only in the most corrupt countries.

the first-differenced GMM estimator can produce biased coefficients since the lagged levels of these variables would serve as weak instruments. Alternatively, the Blundell & Bond (1998) system GMM estimates equation (3) in both first differences and levels which obtains more moment conditions thereby increasing efficiency[1]. See Blundell & Bond (1998), Hauk and Wacziarg (2009) and Roodman (2006) for further details.

6. Results

Table 5 presents results of the model in (1). Before presenting the baseline specification, column 1 first considers a specification without any explanatory variables but corruption, democracy and the interactive term. Later columns will include other controls. Column 2 re-runs this initial specification but removes countries that were always democratic during the sample period. The control group of countries is now those that remained nondemocratic (instead of those that remained nondemocratic or were democratic throughout the sample period). Column 3 then considers our baseline specification whereas column 4 again removes those countries that were always democratic. For these initial regressions, we find positive coefficients for corruption and democracy. The control of corruption and the level of democracy are positively associated with economic growth. These results are in line with empirical findings from previous studies. Papaioannou and Siourounis (2008) and Rodrik and Wacziarg (2005) both find positive associations between democracy and growth. We also find a negative

[1]A critical assumption, however, of system-GMM is that the fixed effects are not correlated with changes in the endogenous variables.

association between corruption and economic growth.[1] However, the coefficient on the interactive term is negative. The association between corruption and economic growth is less positive in democracies, suggesting that the benefits upon growth of controlling corruption are actually greater in authoritarian regimes.

To explore the economic magnitude suggested by the coefficient estimates in column 3, consider three hypothetical countries where the level of democracy is low (DEM=0) in country A, average (DEM=3) in country B and high (DEM=6) in country C, respectively. For country A, growth increases by 1.2 (= 0.85 – 0.24*0) percentage points when CO increases by one standard deviation, 1.39. For country B, a one standard deviation increase in the control of corruption raises growth only by 0.18 percentage points. For the fully democratic country C, the same increase in the control of corruption lowers growth by 0.41 percentage points. These results indicate that the effects of corruption upon growth could vary nontrivially across countries with different political regimes. Most interestingly, the results reveal that the control of corruption might even lower growth in strong democracies. Perhaps corruption in these strong democracies more often occurs so as to "grease the wheel" so as to facilitate productive activities.

Columns 5 and 6 replace the corruption variable from ICRG with that from the World Bank's World Governance Indicators. The latter is available only after 1996 but is available for more countries. Column 5 only uses the WGI corruption variable for the 119 countries used in other specifications whereas column 6 considers a larger set of countries. In both columns, the coefficient upon the interaction term remains negative.

[1] Although our coefficient estimates greatly differ from initial estimates in Méndez and Sepúlveda (2006), they first consider a cross-section of countries and so employ a much different specification.

Similarly, the last two columns replace the corruption variable from ICRG with that from the Transparency International. The coefficient estimates remain robust. The control of corruption raises growth in authoritarian countries but the predicted association is negative in fully democratic countries.

Table 6 considers other democracy measures. The first three columns employ DEM_PS, the democracy variable from Papaioannou and Siourounis (2008). The latter three columns consider the Polity index. The columns for each measure in Table 6 correspond to the specifications of columns 1 and 3 in Table 5. In both cases the coefficient of the interactive term between corruption and the alternative democracy measure remains negative and statistically significant. Table 7 shows results when additional control variables are included. Column 1 adds the lag of GOV as an additional explanatory variable. Column 2 replaces GOV with one year lagged investment (INV). Column 3 replaces GOV and lagged investment with REFORM. Again, the results do not appear to change even when we include GOV, lagged INV and REFORM in the same specification as in columns 4 and 5. Corruption, democracy, and the interaction term remain statistically significant and therefore, consistent with the results provided earlier.[1] Table 8 considers five year windows instead of annual ones to address the concerns outlined in section 4. As before, results are robust.

[1] We also considered life expectancy as another control variable although many observations were missing due to a lack of data. Nevertheless, results are robust when life expectancy is included in the model. Swaleheen and Stansel (2007) report that corruption lowers growth where economic freedom is high and lowers growth where economic freedom is low. Since many democracies are considered economically free, perhaps our democracy variables are proxies for economic freedom which is the real determinant of how corruption influences economic growth. Using the same measure of economic freedom as do Swaleheen and Stansel (2007), the coefficient upon CO, DEM and CO*DEM remain robust.

As an additional robustness check we perform dynamic GMM estimation as discussed above for DEM, POLITY, and DEM_PS as the democracy measure. Table 9 presents these results for both difference-GMM (columns 1-3) and system-GMM (columns 4-6) estimators. We run specifications with the only regressors being the lagged dependent variable, corruption, democracy and the interactive term between the two. The results of the GMM estimates are in agreement with the ones obtained from the fixed effects model for each of the three types of democracy measures. Both the coefficient estimates of control of corruption and democracy are significant and positive. In contrast, the interactive term between the two is negative and statistically significant. Lastly, all six specifications in Table 9 pass the Sargan and second order serial correlation tests.

7. Conclusions

This paper investigates whether the association between corruption and economic growth differs across countries. Using a fixed-effects model and annual panel data from 1984 to 2007, we regressed economic growth on various controls and three additional variables: the inverse of the level of corruption, the degree of democracy, and an interaction between the two. We find that the control of corruption and the level of democracy are positively associated with economic growth. However, the coefficient on the interactive term is negative. The association between corruption and economic growth is less positive in democracies and could even be negative. These findings are robust to changes in model specification, democracy measure, and estimation methodology.

Our findings to a large extent counter those of Méndez and Sepúlveda (2006). They find that corruption affects economic growth in democracies, first raising growth but then decreasing it as the incidence of corruption increases, but that corruption is not

strongly associated with economic growth in nondemocracies. We, on the other hand, find that corruption lowers growth more (that is, the control of corruption raises growth more) in autocracies. Corruption has bigger effects upon growth in nondemocratic countries. Therefore, our findings call into question those from Méndez and Sepúlveda (2006) and so further work is warranted in exploring how associations between corruption and economic growth differ across political regimes. Our results also counter claims that corruption is less harmful in authoritarian countries because it allows one to "grease the wheels" and avoid institutional obstacles dissuading productive activities. If anything, more evidence of greasing the wheels appears for democracies. Perhaps the types of corrupt activities undertaken in strong democracies are more benign than are corrupt activities in nondemocracies. However, we also offered other explanations in section 3 as to why controlling corruption could have greater growth effects in autocracies. Examining these possibilities in greater detail so as to better explain our empirical findings is left for future work.

Apendix 1: Variable Definitions and Country Sample

GROWTH: Annual growth rate of GDP per capita adjusted for PPP. Source: Penn World Tables, version 6.3 (Constant Prices: Chain Series).

GOV: Annual Government Share of Real GDP per capita. Source: Penn World Tables, version 6.3 (Constant $).

INV: Annual Investment Share of Real GDP per capita. Source: Penn World Tables, version 6.3 (Constant $).

REFORM: Dummy variable that indicates whether a country is open to trade. Source: Sachs and Warner (1995) and Wacziarg and Welch (2003).

GPOP: Population Growth Rate. Source: World Bank World Development Indicators CD-ROM (2009 Edition)

CO: International Country Risk Guide indicator of the control of corruption. Measured on 0-6 scale, higher values denote less corruption. Source: Political Risk Services Inc.

DEM_PS: Dummy variable for democratization events; 0 before; 1 after and can be used as a proxy for democracy. Papaioannou & Siourounis (2008)

DEM: Freedom House. Gastil Index. URL: http://www.freedomhouse.org/

POLITY: Marshall, Monty G. and Keith Jaggers. Polity IV Project.
URL: http://www.cidcm.umd.edu/inscr/polity/index.htm.

WGI: World Bank's World Governance Indicators (WGI) constructed by Kaufmann et al. (1999). Rang ranges from -2.5 to +2.5 where higher numbers denote a better control of corruption. Source: World Bank Institute, Worldwide Governance Indicator.
URL: http://info.worldbank.org/governance/wgi/

CPI: Corruption Perception Index. Ranges from 0 to 10 with lower numbers indicating high levels of corruption. Source: Transparency International.
URL: http://www.transparency.org/

Sample of Countries: Albania, Algeria, Angola, Argentina, Australia, Austria, Bahamas, Bahrain, Bangladesh, Belgium, Bolivia, Botswana, Brazil, Brunei, Bulgaria, Burkina Faso, Cameroon, Canada, Chile, China, Columbia, Congo (Dem.), Congo (Rep.), Costa Rica, Cote d'Ivoire, Cuba, Cyprus, Denmark, Dominican Republic, Ecuador, Egypt, El Salvador, Ethiopia, Finland, France, Gabon, The Gambia, Ghana, Greece, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hungary, Iceland, India, Indonesia, Iran, Iraq, Ireland, Israel, Italy, Jamaica, Japan, Jordan, Kenya, Korea, Kuwait, Lebanon, Liberia, Libya, Luxembourg, Madagascar, Malawi, Malaysia, Mali, Malta, Mexico, Mongolia, Morocco, Mozambique, Namibia, Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Pakistan, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Poland, Portugal, Qatar, Romania, Saudi Arabia, Senegal, Sierra Leone, Singapore, Somalia, South Africa, Spain, Sri Lanka, Sudan, Suriname, Sweden, Switzerland, Syria, Tanzania, Thailand, Togo, Trinidad and Tobago, Tunisia, Turkey, Uganda, United Arab Emirates, United Kingdom, United States, Uruguay, Venezuela, Vietnam, Zambia, Zimbabwe.

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Table 1: Summary Statistics and Correlation Matrix

Panel A: Summary statistics

Variable	Obs.	Mean	Max	Min	Std. Dev.
Growth	2855	1.66	88.74	-64.36	6.61
CO	2824	3.09	6	0	1.39
DEM (Freedom House)	2851	3.38	6	0	1.99
DEM_PS	2856	0.55	1	0	0.49
POLITY	2577	2.53	10	-10	7.24

Panel B: Correlations

Correlation	Growth	CO	DEM	DEM_PS	POLITY
Growth	1.00				
CO	0.01	1.00			
DEM	0.08	0.51	1.00		
DEM_PS	0.09	0.35	0.83	1.00	
POLITY	0.08	0.42	0.91	0.86	1.00

Table 2.

Panel Data Regressions (annual), 1984 – 2007

	(1)	(2)	(3)	(4)
Estimation method	Fixed Effects	Fixed Effects	SYS GMM	SYS GMM
Dependent Variable	DEM	CO	DEM	CO
Constant	1.31 (0.44)***	0.57 (0.57)	0.25 (0.34)	0.02 (0.29)
GDP(-1)	-0.07 (0.04)	-0.01 (0.06)	-0.01 (0.04)	-0.003 (0.03)
DEM(-1)	0.82 (0.01)***		0.97 (0.03)***	
CO(-1)		0.84 (0.01)***		1.01 (0.02)***
Observations	2732	2705	2732	2705
Number of countries	119	119	119	119
Sargan Test (p-value)	____	____	0.16	0.23
AR (2) Test (p-value)	____	____	0.71	0.00

Standard errors in parentheses: * significant at 10%, ** significant at 5%, *** significant at 1%

Table 3: Total Average Change in Corruption for the period 1984-2007

GROUP A	Change in Corruption	GROUP B	Change in Corruption
Albania	3	Algeria	1.5
Bangladesh	2.04	Angola	1
Brazil	1.42	Bahrain	1
Bulgaria	2	Brunei	2.5
Chile	1.16	Burkina Faso	2
El Salvador	0.5	Cameroon	2.25
Ethiopia	1	China	1.88
Ghana	0.08	Congo, Dem. Rep.	1
Guatemala	0.5	Congo, Republic of	2
Guyana	1	Cote d`Ivoire	0.7
Hungary	1	Cuba	0.5
Indonesia	2.04	Egypt	0.33
Iran	1	Gabon	1
Korea, Republic of	0.33	Guinea	1
Madagascar	4	Guinea-Bissau	0
Malawi	2.13	Haiti	1
Mali	1	Iraq	1.66
Mexico	1	Jordan	0
Mongolia	2	Kenya	1.5
Mozambique	2.33	Kuwait	0
Nicaragua	0.5	Liberia	1.5
Niger	2.7	Malaysia	2.16
Nigeria	0.16	Libya	1.5
Panama	0	Morocco	1
Paraguay	0.75	Oman	0.5
Philippines	2	Qatar	0.5
Poland	0.5	Saudi Arabia	1.33
Romania	0.5	Sierra Leone	0.5
Senegal	0.5	Singapore	1.5
South Africa	3.5	Somalia	3
Suriname	0	Sudan	0.41
Tanzania	0.74	Syria	0.58
Thailand	1.5	Togo	0.5
Uruguay	0	Tunisia	1
Zambia	1.91	Uganda	1
		United Arab Emirates	1
		Vietnam	0.95
		Zimbabwe	3.33
Total Avg. Change in Corruption	1.28		1.18

Group A: Countries that experienced some form of democratization between 1984 -2007.

Group B: Countries that were always autocratic in the period 1984-2007.

Table 4: Average Corruption Score – Democratized Countries between 1984 -2007

PANEL A:

Country	5 years before Democratization	5 years after democratization	Country	5 years before Democratization	5 years after democratization
Albania	4.00	3.57	Mongolia	4.00	4.00
Bangladesh	0.02	1.67	Mozambique	4.00	4.00
Brazil	3.41	4.00	Nicaragua	4.88	5.00
Bulgaria	3.58	4.20	Niger	1.72	0.80
Chile	3.00	3.00	Nigeria	1.90	1.00
El Salvador	2.23	3.33	Panama	2.00	2.00
Ethiopia	2.32	2.00	Paraguay	0.80	2.03
Ghana	3.10	2.42	Philippines	0.56	2.00
Guatemala	2.00	3.80	Poland	4.00	4.98
Guyana	1.00	2.15	Romania	2.00	3.90
Hungary	4.00	4.95	Senegal	3.00	3.00
Indonesia	0.27	2.20	South Africa	5.00	4.73
Iran	3.63	3.79	Suriname	2.28	3.00
Korea, Republic of	2.21	2.75	Tanzania	4.00	2.78
Madagascar	4.00	4.00	Thailand	3.00	3.00
Malawi	3.50	3.00	Uruguay	3.00	3.00
Mali	1.45	2.60	Zambia	2.00	3.33
Mexico	2.90	2.73			

PANEL B: Corruption Index - Frequency Breakdown

Increased by < 1	Increased by > 1	Remained the same	Decreased by < 1	Decreased by > 1
Brazil	Bangladesh	Chile	Albania	Tanzania
Bulgaria	El Salvador	Madagascar	Ethiopia	
Hungary	Guatemala	Mongolia	Ghana	
Iran	Guyana	Mozambique	Malawi	
Korea, Republic of	Indonesia	Panama	Mexico	
Nicaraguw	Mali	Senegal	Niger	
Poland	Paraguay	Thailand	Nigeria	
Suriname	Philippines	Uruguay	South Africa	
	Romania			
	Zambia			

Table 5.

Panel Data Regressions (annual), 1984-2007

Dependent variable is the growth rate of real GDP per capita (PPP)

Panel A: Coefficient Estimates

Estimation method	(1) Fixed Effect	(2) Fixed Effect	(3) Fixed Effect	(4) Fixed Effect	(5) Fixed Effect	(6) Fixed Effect	(7) Fixed Effect	(8) Fixed Effect
Corruption Index	**ICRG**	**ICRG**	**ICRG**	**ICRG**	**WGI**	**WGI**	**CPI**	**CPI**
CO	0.65 (0.33)**	0.94 (0.48)***	0.85 (0.42)**	1.02 (0.59)*	4.30 (0.73)***	3.85 (0.97)***	1.36 (0.67)**	1.29 (0.59)**
DEM	0.878 (0.29)***	1.40 (0.47)***	1.01 (0.35)***	1.24 (0.54)**	0.13 (0.41)	0.05 (0.36)	1.48 (0.52)***	1.24 (0.41)***
CO*DEM	-0.14 (0.07)**	-0.41 (0.13)***	-0.24 (0.09)***	-0.38 (0.16)**	-0.92 (0.32)**	-0.80 (0.05)**	-0.30 (0.14)**	-0.25 (0.11)**
GDP (-1)			-8.60 (1.75)***	-4.65 (1.19)***	-12.06 (1.67)***	-6.81 (3.23)**	-5.51 (1.49)***	-4.71 (1.93)***
GPOP			-0.03 (0.50)**	0.80 (0.59)*	1.24 (0.30)***	1.29 (0.41)**	0.60 (0.31)*	0.52 (0.24)**
Observations	2823	1803	2713	1641	946	1254	952	1292
Country Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES
Time Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES
Number of countries	119	76	119	76	119	145	119	155
R-squared (within)	0.11	0.17	0.17	0.29	0.39	0.40	0.40	0.40

Panel B: Estimated Effects of Corruption Upon Growth for Different Values of DEM

DEM=0	0.65**	0.94**	0.85***	1.02**	4.30**	3.85***	1.36**	1.29***
DEM=3	0.23	-0.29	0.13	-0.12	1.54	1.45	0.46	0.54
DEM=6	-0.19***	1.52**	-0.59***	-1.26**	-1.22**	-0.95**	-0.44**	-0.29**

Standard errors in parentheses: * significant at 10%, ** significant at 5%, *** significant at 1%

Regressions performed utilized White heteroskedastic-consistent covariance matrices.

Wald Coefficient Tests used to determine statistical significance in Panel B.

Note: Columns 2 and 4 exclude all the countries from our sample that were democratic throughout the sample period. Also, Columns 5-8 consider different indicators for corruption.

Table 6.

Panel Data Regressions (annual), 1984 – 2007
Robustness Checks using alternative measures for Democracy
Dependent variable is the growth rate of real GDP per capita (PPP)

	(1)	(2)	(3)	(4)	(5)	(6)
Estimation method	Fixed Effects	Fixed Effects	Fixed Effects	Fixed effects	Fixed Effects	Fixed Effects
CO	0.38	0.37	0.37	0.29	0.22	0.28
	(0.30)	(0.26)*	(0.18)**	(0.27)***	(0.28)**	(0.12)**
DEM_PS	2.03	2.24	1.83			
	(0.93)**	(0.87)**	(0.75)**			
CO*DEM_PS	-0.73	-0.67	-0.45			
	(0.30)***	(0.30)**	(0.22)**			
GDP(-1)		-4.63	-5.14		-5.26	-4.56
		(1.24)***	(0.56)***		(2.45)**	(0.62)***
GPOP		0.88	0.69		0.74	0.36
		(0.30)*	(0.14)***		(0.40)*	(0.31)
POLITY				0.29	0.26	0.12
				(0.08)***	(0.11)**	(0.04)***
CO*POLITY				-0.07	-0.07	-0.03
				(0.02)***	(0.03)**	(0.01)**
Observations	1803	1641	2703	1629	1564	2454
Number of countries	76	76	119	76	76	119
Country Fixed Effects	YES	YES	YES	YES	YES	YES
Time Fixed Effects	YES	YES	YES	YES	YES	YES
R-squared (within)	0.18	0.28	0.25	0.17	0.26	0.21

Standard errors in parentheses: * significant at 10%, ** significant at 5%, *** significant at 1%
Regressions performed utilized White heteroskedastic-consistent covariance matrices.

Note: Columns 3 and 6 include all the countries from our sample. The remaining columns exclude countries that were democratic throughout the sample period.

Table 7.

Panel Data Regressions (annual), 1984 - 2007

Dependent variable is the growth rate of real GDP per capita (PPP)

	(1)	(2)	(3)	(4)	(5)
Estimation method	Fixed Effects	Fixed Effects	Fixed Effects	Fixed Effects	Fixed Effects
CO	1.10 (0.57)**	1.03 (0.58)*	1.00 (0.57)*	0.91 (0.5)*	0.76 (0.22)***
DEM	1.23 (0.52)***	1.26 (0.53)**	1.20 (0.53)**	1.05 (0.45)**	0.66 (0.20)***
CO*DEM	-0.35 (0.15)***	-0.37 (0.15)**	-0.34 (0.15)**	-0.29 (0.13)**	-0.15 (0.05)***
GDP(-1)	-4.46 (0.95)***	-4.65 (1.13)***	-4.73 (0.98)**	2.82 (0.83)***	-3.58 (0.60)***
GPOP	0.80 (0.41)**	0.76 (0.42)*	0.76 (0.43)*	0.40 (0.33)	0.22 (0.16)
GOV(-1)	-0.15 (0.07)**			-0.11 (0.06)*	-0.07 (0.02)**
INV(-1)		0.06 (0.02)**		0.03 (0.04)	0.01 (0.02)
REFORM			1.89 (0.50)***	1.44 (0.66)**	1.50 (0.38)***
Observations	1641	1641	1641	1641	2509
Number of countries	76	76	76	76	119
Country Fixed Effects	YES	YES	YES	YES	YES
Time Fixed Effects	YES	YES	YES	YES	Yes
R-squared (within)	0.30	0.29	0.30	0.29	0.22

Standard errors in parentheses: * significant at 10%, ** significant at 5%, *** significant at 1%
Regressions performed utilized White heteroskedastic-consistent covariance matrices.

Table 8.

*Panel Data Regressions (**5 year averages**), 1984-2007*

Dependent variable is the growth rate of real GDP per capita (PPP)

Estimation method	(1) Fixed Effect	(2) Fixed Effect	(3) Fixed Effect	(4) Fixed Effect	(5) Fixed Effect	(6) Fixed Effect
CO	0.61 (0.27)**	0.66 (0.31)**	0.58 (0.27)**	0.60 (0.28)**	0.55 (0.27)**	0.88 (0.37)**
DEM	0.56 (0.21)***	1.13 (0.54)**	0.55 (0.20)***	1.13 (0.40)***	0.47 (0.20)**	1.04 (0.39)***
CO*DEM	-0.10 (0.04)**	-0.38 (0.13)***	-0.11 (0.05)**	-0.34 (0.13)**	-0.12 (0.05)**	-0.32 (0.13)**
GDP (-1)			0.22 (0.16)	0.31 (0.22)	0.06 (0.17)	0.16 (0.22)
GPOP			0.0001 (0.0002)	0.0009 (0.001)	0.0001 (0.0002)	0.0003 0.0003
GOV(-1)					-0.008 (0.02)	0.001 (0.02)
INV(-1)					0.05 (0.01)***	0.06 (0.02)***
REFORM(-1)					0.88 (0.53)*	0.80 (0.44)*
Observations	564	350	564	350	564	350
Country Fixed Effects	YES	YES	YES	YES	YES	YES
Time Fixed Effects	YES	YES	YES	YES	YES	YES
Number of countries	119	76	119	76	119	76
R-squared (within)	0.15	0.17	0.16	0.19	0.21	0.20

Standard errors in parentheses: * significant at 10%, ** significant at 5%, *** significant at 1%
Regressions performed utilized White heteroskedastic-consistent covariance matrices.

Note: Column 2, 4 and 6 exclude all the countries from our sample that were democratic throughout the sample period.

Table 9.
Dynamic GMM regressions (annual), 1984-2007
Dependent variable is the growth rate of real GDP per capita (PPP)

Estimation Method	(1) Diff-GMM	(2) Diff-GMM	(3) Diff-GMM	(4) Sys-GMM	(5) Sys-GMM	(6) Sys-GMM
GDP (-1)	0.826 (0.006)***	1.07 (0.009)***	0.83 (0.07)***	0.99 (0.001)***	1.00 (0.001)***	1.01 (0.003)***
CO	0.004 (0.002)**	0.018 (0.003)***	0.01 (0.004)***	0.021 (0.002)***	0.019 (0.001)***	0.003 (0.001)**
DEM	0.007 (0.002)***			0.029 (0.001)***		
DEM_PS		0.11 (0.022)***			0.15 (0.132)***	
POLITY			0.005 (0.001)***			0.001 (0.000)***
CO*DEM	-0.003 (0.000)***			-0.006 (0.000)***		
CO*DEM_PS		-0.025 (0.005)***			-0.041 (0.003)***	
CO*POLITY			-0.002 (0.000)**			-0.002 (0.001)**
# of Countries	119	119	119	119	119	119
# of Observations	2823	2823	2556	2823	2823	2556
Sargan Test (p-value)	0.26	0.53	0.42	0.10	0.11	0.14
AR (2) Test (p-value)	0.46	0.11	0.18	0.45	0.57	0.11

Standard errors in parentheses: * significant at 10%, ** significant at 5%, *** significant at 1%
Period fixed effects omitted to ease presentation.