CORRUPTION, REGIME TYPE, AND ECONOMIC GROWTH

Ilan Alon, University of Agder, Norway
Shaomin Li, Old Dominion University, USA
Jun Wu, Savannah State University, USA

ABSTRACT

While prevailing wisdom suggests that less corrupt and more democratic countries perform better economically, the existing literature is, at best, inconsistent. We build a theory that links corruption and regime type to economic growth and test it on 158 countries, using multiple databases including Polity IV, transparency international, and other the World Bank. In this way, we are able to show that under autocracy, corruption is less harmful to economic growth than under anocracy, thereby, resolving some of the inconsistent and contradictory results of the aforementioned literature linking corruption to economic growth. The article shows that democracies have the lowest level of corruption, while autocracies outperform anocracies economically because they embed corruption more efficiently. Policies should minimize disruptions and efficiency losses caused by corruption during the transition from autocracy to democracy.

*Keywords***:** *political regime; democracy; anocracy; autocracy; corruption; economic growth*

1. INTRODUCTION

Although the theory that corruption hurts economic development is logical and widely accepted, it is notoriously poor in predicting or explaining the various patterns in the corruption–economic growth relationship across countries. Recognizing that both corruption and economic performance are closely related to the type of political system, scholars of political economy have recently begun to examine the relationships among corruption, economic performance, and the political system in an attempt to shed light on the different conditions under which corruption may impact the economy. These efforts, however, have thus far achieved limited success, leaving the mystery of the corruption–growth relationship largely intact and questions as to why democratization has not effectively reduced corruption in some countries, such as Ukraine or Indonesia, unanswered.

Studies of the effect of corruption on economic growth, albeit their long history, have failed to produce conclusive evidence of a negative impact both at the macro (e.g., Li & Wu, 2010) and micro (e.g., Vial & Hanoteau, 2010) levels. Even though the literature is growing rapidly, empirical evidence about the relationship remains elusive.

Studies on political regime and economic growth, which also have a long history, have not fared much better. Empirical evidence on the relationship is inclusive; for instance, an economy can achieve high growth under either a democracy or a dictatorship (Przeworski, Alvarez, Cheibub & Limongi, 2000; Libman, 2012).Examining the Russian regions between 2000 and 2004, Libman (2012) found that those regions with a high level of democracy *and* a high level of autocracy performed better than hybrid regions. Furthermore, the literature on democratization often simply divides countries into two types, democracies or non-democracies (Cheibub, Gandhi & Vreeland, 2010), failing to account for countries that are undergoing rapid transition from dictatorship to democracy.

In this study, we attempt to address these weaknesses by proposing a new perspective to understand the effects of corruption on economic performance by simultaneously examining the relationships of corruption and regime type on economic growth. In particular, we look at how the interactions between corruption and regime type affect economic performance across countries. Drawing on past studies (Li & Wu, 2010, Schofield & Gallego, 2011; Shleifer & Vishny, 1993), we propose corruption will affect economic performance in different ways under the following three different political regimes: autocracies (dictatorships or totalitarian regimes), anocracies (including emerging and infant democracies), and democracies[1].We argue that although mature democracies are best in terms of controlling corruption and they tend to have high levels of economic development, corruption exerts differing effects on autocracies and anocracies. As compared to anocracies, corruption in autocracies may be less harmful due to the centralized control over bribe-taking. That is, public resources are efficiently awarded to those making bribes. In contrast, corruption in anocracies, or during the transition stage from an autocratic to a more democratic government, is usually accompanied by a decrease in efficiency (e.g., a briber pays, but the bribee fails to deliver due to the weakening political power of corrupt officials).As a result, due as well to the underdeveloped institutions and weak state apparatus, growth will be lower in anocracies than in dictatorships. To test these conjectures, we compiled data on corruption, regime type, and economic growth for 158 countries with multiple years of observations. The statistical analyses support our argument.

Our key contribution is to link corruption with regime type and to reveal that corruption will become worse during the transitional stage of democratization. Using a rigorous empirical analyses, we show that the negative effect of corruption is worse in anocracies than it is in autocracies. Our finding adds a missing piece to the mystery of the corruption–growth relationship by demonstrating why some countries thrive despite corruption and why democratization does not automatically eliminate corruption. From a public-policy

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1. We refer to mature democracies with a strong rule of law and democratic institutions

perspective, our study demonstrates that there is no support to the argument that dictators use the increases in corruption and declines in economic growth during a democratic transition to defend their totalitarian rule. A government undergoing democratic transition should formulate policies that effectively fight corruption and increase governing capacity, thus minimizing the negative impact of corruption on economic growth. In the following sections, we will review existing studies on the relationship among corruption, regime type, and economic growth, develop and test our hypotheses, and discuss the contributions and policy implications of this study.

2. CORRUPTION, REGIME TYPE, AND ECONOMIC GROWTH

2.1 CORRUPTION AND ECONOMIC GROWTH

Corruption, whereby a government official sells the public goods under his control to a firm (or to an individual) that bribes him for his/her private gains, raises the costs of doing business. Corruption has both direct (bribes, red tape, unproductive behavior, organized crime) and indirect (reduced investment, distorted public expenditures, macroeconomic weakness and instability, social economic failure, squandered entrepreneurial talent) costs (Doh, et al., 2003).Corruption affects a society politically, economically, and culturally, and scholars from both the social science and humanity fields have studied it. For example, there is a rich literature on the nature of corruption using various analytical lenses (see, for example, Lopez and Santos, 2014, Kimeu, 2014, Hill 2013, Antoci and Sacco, 2002).We particularly contribute to the field of political economy by focusing on the effect of corruption on economic growth moderated by political regime type.

From the economic perspective, a corrupt government official is motivated to choose projects that maximize opportunities for bribes rather than projects that maximize public benefit, distorting the efficient allocation of resources in a free market and thus negatively affecting the long-term growth prospects (Gupta, de Mello & Sharan, 2001; Mauro 1998; Shleifer & Vishny, 1993; Tanzi & Davoodi, 1998).Reiter and Steensma (2010), in an examination of the influence of corruption and foreign direct investment (FDI) on developing countries, suggest that the relationship between FDI and improvements in human development is strong and positive when the level of corruption is low. In sum, lower corruption will lead to higher economic growth.

Although the negative effects of corruption on economic growth are indisputable from a logical perspective, scholars have developed theories and conducted empirical studies that contradict the idea that corruption only plays a negative role in economic development. While there are many studies that find a negative effect of corruption on economic growth (Hall & Jones, 1999; Mauro, 1995; Myrdal, 1989), other studies suggest that corruption may contribute

to development by "greasing the wheels" (Méon & Weill, 2010; Vial& Hano-teau, 2010). Méndez and Sepúlveda (2006) find that there may exist a level of corruption that maximizes economic development in developing countries, partly because graft will provide an alternative channel to stimulate investment in the case of failure of the public sector. Leff (1968) suggests that military dictators may be better poised to modernize and where corruption is prevalent, weaker firms will become more efficient and productive. The costs of combating corruption may outweigh the benefits (Acemoglu & Verdier, 1998; Klitgaard, 1988). In developing countries in particular, pervasive corruption may be relatively immune to intervention as it becomes a norm (Mishra, 2006).

These inconsistencies in the research findings on the role of corruption in economic growth suggest that some major explanatory factors may be missing. Specifically, corruption should be addressed in the context of the type of government. Before we develop our theory linking political regime to corruption and growth, a review of the literature on regime type and economic growth is in order.

2.2 REGIME TYPE AND ECONOMIC GROWTH

There is a rich literature on the impact of regime type on economic growth, originating initially in the field of political economy and focusing primarily on democracy. Although it may be appealing intuitively, however, research on democracy does not reveal a consistent positive linear relationship between democracy and growth (Drury, Krieckhaus & Lusztig, 2006).

Feng (1995) suggests there are three schools of thought that relate democracy to economic growth. (1) The "conflict school" argues that a democracy will inhibit economic growth when a country is underdeveloped because of dysfunctional state operations due to the immaturity of democracy and the lack of control over economic activities. In contrast, autocracies will be more able to achieve growth as they are able to accumulate and distribute resources more efficiently. Advocates of this school of thought include political scientists Huntington (1968), Moore (1966), and Sirowy and Inkeles (1990). (2) In contrast, the "compatibility school" suggests that a democracy that promotes political and economic freedoms will enhance property rights, market competition, and economic growth (see, for example, Rothstein, 2011). (3) The "skeptical school" does not find any relationship between democracy and economic development (see, for example, Pye, 1966). This school of thought argues that economic policies (such as import substitution, industrial policy, and so forth), rather than democracy per se will affect economic growth.

Empirical findings are conflicting, ranging from there being no relationship (Bilson 1982), a strong positive relationship (Grier & Tullock 1989), a weak positive relationship (Kormendi & McGuire 1985), or a negative rela-

tionship (Helliwell 1994; Landau 1986; Weede 1983) between regime type and economic growth. In sum, the inconsistencies in the findings in both corruption-growth and regime type–growth studies suggest that we must consider the three variables simultaneously. In the next subsection, we will review what we know about the relationship among the three.

2.3 CORRUPTION, REGIME TYPE, AND ECONOMIC GROWTH

Scholars have increasingly begun to speculate that the type of political regime may moderate the effect of corruption on economic growth. Below we describe some of the research that supports this argument.

Shleifer and Vishny (1993) analyze the effect of corruption on economic growth from an industrial organization perspective, arguing that there are three types of bribery–corruption arrangements: (1) a monopoly whereby only one entity sells government goods for bribes; (2) a power structure whereby multiple independent entities sell complementary government goods for bribes, and (3) a system whereby each of the complementary goods may be sold by at least two competing agencies. Shleifer and Vishny further argue that corruption is worse in the second arrangement and is the least harmful in the third arrangement (the competing-agency scenario).

Ehrlich and Lui (1999) build a balanced, endogenous growth equilibrium model linking corruption, government, and growth. According to their reasoning, political agents are motivated, on the one hand, by the maximization of human capital that engenders growth and, on the other hand, by the maximization of political capital that ensures bureaucratic power. They find that the relationship between corruption and growth exists only in democratic regimes, and autocratic regimes and command economies may achieve higher growth than decentralized democracies if they maximize the long-term growth prospects of productive agents while controlling corruption.

Drury, Krieckhaus and Lusztig (2006) suggest that democracy moderates the impact of corruption on growth. They claim that in mature democracies, electoral mechanisms dampen corruption as political agents must seek re-election. Using a dataset of 100 countries over a period of 16 years, the authors show that corruption had no effect on economic growth in democracies, but had a significant and negative impact in other regime types.

Aidt *et al.* (2008) suggest that the effect of corruption on growth is conditional on the governance regime. In regimes characterized by high-quality political and economic institutions, corruption has a significant and negative impact on growth. In contrast, in regimes featuring low-quality political and economic institutions, growth will not be affected by corruption.

Attempting to explain the East Asian paradox (high corruption coupled with high growth), Rock and Bonnett (2004) posit that a cross-country relationship is not robust and that in the newly industrialized economies of East Asia there are stable and mutually beneficial exchanges between government officials and business leaders who offer bribes and provide kickbacks. Méon and Weill (2010) suggest that corruption is less detrimental to growth in countries where the institutional environment is weak.

A study by Li and Wu (2010), although not focusing specifically on political regime type, proposes that corruption may be growth-enhancing in relation-based societies (such as the East Asian Tigers), where the level of extended particularized trust is high. In such societies, powerful bureaucrats will sell public resources to those firms that can pay the highest bribes through extended, trust-based informal networks, and consequently the bribe-givers can trust that the recipients of the bribes will perform according to their implicit agreements across time or space. This may help to explain why some countries with high corruption (such as China) can still achieve high growth, while others (such as the Philippines) cannot. This study reveals that corruption may be less harmful in countries in which thick informal relational networks exist. Similarly, Blackburn and Forgues-Puccio (2009) used a dynamic general equilibrium model to explore why corruption is less harmful in some countries than in others and found that organized corruption networks tend to display lower level of bribes and therefore higher growth rates than countries with disorganized corruption arrangements.

The above studies suggest that the effect of corruption on economic growth is moderated by the institutional social environment, such as the culture, the governance environment (Li & Wu, 2010), or the political system (Aidt *et al.,* 2008; Drury, Krieckhaus & Lusztig, 2006; Ehrlich and Lui, 1999; Shleifer & Vishny, 1993). This provides a basis for our proposed framework on the link among corruption, regime type, and economic growth, as elaborated upon below.

2.4 REGIME TYPE, CORRUPTION, AND ECONOMIC GROWTH: THE ROLE OF TRANSITION

We propose that corruption exerts different effects on economic growth in the following three types of political regime (see Marshall and Cole (2011) for definitions, and a list of the countries falling under each type of political regime is included in Appendix A).

Type 1—Autocracy: This is a totalitarian regime, or dictatorship, such as Suharto's Indonesia or Marcos' Philippines, characterized by a strong dictator who wields iron control over society. The objective is to centrally maximize total bribes. In such a regime, the targets of the bribes are clear and the deliv-

ery of goods to the briber is secure. We call this a "one big mafia" corruption model. This type of government, similar to those in China, Iran, or Syria (before the revolution), dominates economic activities. Using the framework provided by Li and Wu (2010), these societies, where bribery may be efficient, are characterized by a strong relation orientation coupled with societal trust. Campos, Lien, and Pradhan (1999) suggest that corrupt regimes that are predictable (in terms of corruption leading to favors) have less of a negative impact on investment.

Type 2—Anocracy: This is a political structure in which power is divided among multiple independent agencies, referred to as a "many small mafias" model. This regime type may be the result of a breakdown of the "one big mafia" regime and the emergence of democracy. Examples include countries where totalitarianism is weakening and democracy is in its infancy, such as Russia in the 1990s, Indonesia immediately after the fall of Suharto, or Egypt after the Arab Spring. Anocracy is characterized by a weak central government and many agencies that control complementary government goods. Each agency maximizes its own bribes independent of the other agencies and collectively drives bribes to prohibitively high levels, thus stifling growth. According to Li and Wu (2010), in these societies, old relations begin to decline and trust is low, thus leading to low economic growth. In anocracies, power is not effectively exercised as in either mature democracy or full dictatorship, but rather it is spread out among elite groups that are competing for power, leading to turf wars among government agencies and, thus, overall economic inefficiency.

Type 3—A mature democracy: A mature democracy is characterized by governmental checks and balances that substantially reduce or minimize monopolies over key government services. As an example, there are at least two government agencies that offer key government services (e.g., the U.S. passport agencies).Such societies exist in North America and Western Europe, but mature democracies have also emerged in other parts of the world (e.g., Botswana, Israel, Japan, Mauritius, and Uruguay). In a mature democracy, effective government checks and balances among the branches of government and a non-political and independent legal system keep corruption at its lowest levels, as compared to its levels in the two other regime types (Feng, 1995; Jalles, 2011; Krieckhaus, 2006).Mature democracies are closely associated with mature free markets and high levels of economic development, but where, given the high levels of economic development and of per capita income, the growth rate inevitably will slow down (Horn, 2011; Swaleheen & Stansel, 2007). For corruption to occur, government officials must possess quasi-monopoly power or authority that allows them to support individuals within and across activities (Dey, 1989). Because in democracies there are more checks and balances and more restrictions on the power of specific people and branches of government, democracies contain fewer seeds of corruption.

In contrast, in an autocracy power is concentrated in the ruling party or the elite, which has an incentive to maximize the total amount of corruption and to develop the economy (so that it can extract further bribes and prevent a potential overthrow).This incentive encourages the ruling party/elite to award economic resources and projects to those firms that pay the highest bribes, assuming all bribers subject to the same project specifications, the highest bribe payer is the most efficient. As a result, corruption is less harmful and can actually be efficiency-enhancing (Li & Wu, 2010).

The most interesting, and the least discussed, issue is how corruption affects economic growth in anocracies. Here we examine the power of bureaucrats during the transition from autocratic to democratic governance. An anocracy oftentimes exists during the stage when an autocratic society begins political and economic reforms but does not complete the process (e.g., the ex-Soviet countries), and thus the society are only partially democratized. The resultant system still contains elements of the old autocracy, with oligarchic elites vying for both economic resources and political power. The struggles over resources and power lead to a fractionalization of economic activity. Because of the breakdown in the supreme power of a single actor (the autocrat), independent political agents attempt to maximize their own rents, raising the total cost of corruption. Furthermore, since power is diffused among several elite groups, the bribe-taker cannot guarantee the delivery of favors. Thus, the growth-enhancing benefits of corruption may be less than those under an autocracy. As such, partially democratized countries will have a higher level of corruption and this corruption will likely have a more negative impact on economic growth as compared to that in an autocracy.

The above classification is also supported by other's studies. Doh et al. (2003) suggests that corruption split into two dimensions: pervasiveness (number and frequency of transactions and people) and arbitrariness government agents act independently and capriciously).In anocracies, corruption is most damaging because these societies are high in both pervasiveness and arbitrariness (such as in Russia), while in autocracies, while corruption may be pervasive, it is less arbitrary and therefore more efficient (such as in China). In democracies, in contrast, corruption is efficiently and effectively prosecuted by law and thus substantially reduced, making the issue of pervasiveness and arbitrariness less relevant.

Several studies have concentrated on the role of transition in economic growth. Most notable are the comparisons between Russia and China (e.g. Wedeman, 2012; Sun, 1999; Larsson, 2006) that take these two countries as examples to illustrate why corruption is more harmful for economic growth in some countries than in others. These studies maintain that it is the nature of reforms that matters (i.e. economic reforms within autocratic political system as in China, or simultaneous economic and political reforms as in Russia) for a

certain type of corruption to become prevalent. China is an autocracy, while Russia is an anocracy, according to Polity IV.

Figure 1. China vs. Russia in Polity Score (source: Polity IV project)[2]
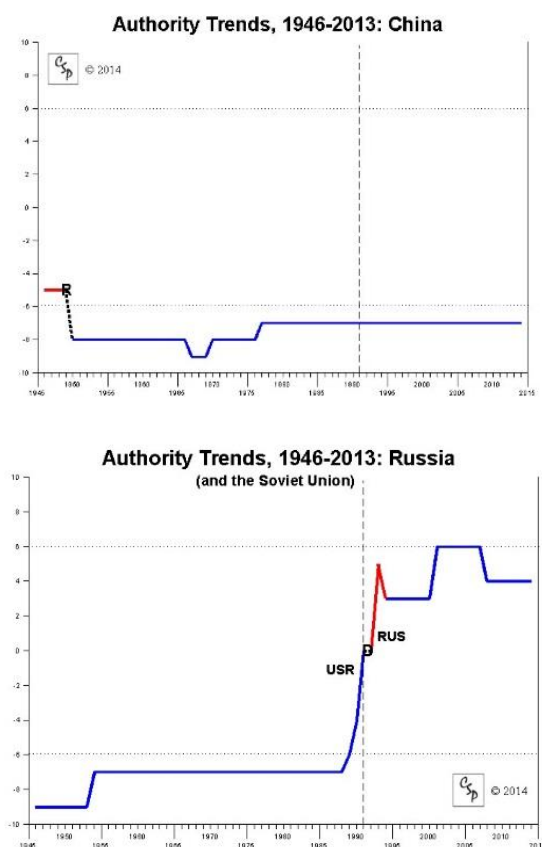
Sun (1999) suggests that China's strong authoritative-style governance, which includes numerous mechanisms, such as mass monitoring system, the Center of Reporting Economic Crimes, office for the inspection of tax revenues, bookkeeping and consumer prices, and party's disciplinary committees, is not crippling. In contrast, in Russia during transition, the regime reputation for discipline broke apart and top echelons abuses of the system were routinely ignored, including unabashed transfer of public property to themselves and their cronies. Russia's state weakness in controlling banks, commodity exchanges and stock markets, frequent bribery in the court system, and mafia dominated economy stifled economic growth. The comparison between Russia and China strengthens our argument relating to the corruption-polity-growth propositions. One implication of our research is that the dominant form of corruption in anocracies might be extortion, while in autocracies mutually beneficial exchange. Figure 1 shows the political transition of Russia and Chi-

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2. Retrieved May 20, 2016 from http://www.systemicpeace.org/polity/polity4.htm

na since 1946.While China's polity remained autocratic, Russia has shifted towards an anocracy following the collapse of the Soviet Union.

Political regimes are not static and countries move between the three types of regimes over time. Since the 1990s, the world has witnessed a trend of autocracies moving to democracies. However, before these autocracies evolve into full democracies, they go through anocracies, which are the least stable with weakest governing capacity because the power of the old autocratic elite begins to decline and yet the new rule of law has not been established (Marshall and Cole, 2011).As a result, before corruption can be eventually reduced when the country achieves well-functioning full democracy, corruption will be more severe and less efficient, because there are more officials to bribe and few of them are able to deliver the public goods to the briber.

Summarizing our review of the literature and our ideas elaborated upon above, we propose the following hypotheses:

Hypothesis 1a.In terms of the level of corruption, Type 3 (mature democracies) regime types are the least corrupt as compared to Type 1 (autocracies) and Type 2 (anocracies) regime types;

Hypothesis 1b.In terms of the level of corruption, Type 2 (anocracies) regime types are more corrupt than Type 1 (autocracies) regime types.

In sum, the relationship between regime type and corruption is nonlinear: corruption rises from autocracy to anocracy, peaks at anocracy, and declines from anocracy to the lowest level in democracy. Shleifer and Vishny (1993) argue that if the organization of "corruption networks" is weak due to the breakdown of the political monopoly, the person paying the bribe is not assured that he will get the government goods and services and numerous bureaucrats need to be bribed, decreasing the efficiency of the bribe.

Hypothesis 2a.In terms of economic growth, Type 3 (mature democracies) regime types, which are the most developed of the three types, have the lowest economic growth rate as compared to the growth rates in Type 1 (autocracies) and Type 2 (anocracies) regime types.

Hypothesis 2b.In terms of economic growth, Type 1 (autocracies) regime types are more efficient than Type 2 (anocracies) regime types.

Hypothesis 3.In terms of the corruption–regime interaction effects on growth, corruption is more harmful to economic growth in Type 2 (anocracies) regime types than it is in Type 1 (autocracies) regime types. In other words, corruption will enhance economic growth in Type 1 (autocracies) regime types whereas it will hurt economic growth in Type 2 (autocracies) regime types.

3. METHODOLOGY

3.1 TESTING STRATEGY

We collected data from reputable publicly available sources that cover all countries and use appropriate statistical analytical tools. More specifically, we used correlation analysis and multivariate regression analyses to establish the relationship among the variables and to identify patterns among the variables so as to determine whether our hypotheses are supported.

3.2 DATA AND MEASUREMENT

The key constructs we are trying to measure are economic growth, corruption, and regime type. Past studies have successfully operationalized these constructs into variables that are well established and commonly used. Following earlier studies, we developed our measurements (including the control variables) as follows:

Economic Growth (dependent variable).We have two measurements for Economic Growth, GDP growth rate (GDP_growth) and GDP per capita growth rate (GDP_PC_growth).Both are collected from the *World Development Indicators* (WDI) (World Bank, 2013).To measure economic growth, we used the average of the annual GDP growth rate and the annual GDP per capita growth rate from 2008 to 2012.

The key predictor variables are corruption and regime type. To make our study robust, we use six different measurement of Corruption.CPI_5YA is adopted from the Corruption Perception Index (CPI) developed by Transparency International (from 2008 to 2012). We transformed the original CPI score so that it ranges from 0 (most clean) to 10 (most corrupt) and we measured it by taking the average for the five years from 2008 to 2012.CPI_2011R and CPI_2010R are rescaled CPI from year 2011 and 2010, respectively.ICRG2012R is the rescaled corruption indicator of Political Risk component of International Country Risk Guide in 2012, ranging from 0 (most clean) to 6 (most corrupt).CoCorrupt2011R and CoCorrupt2010R are control of corruption indicator in 2011 and 2010 from Worldwide Governance Indicator (WGI) developed by World Bank. They were reversed coded into a range of -2.5 (most clean) to +2.5 (most corrupt).

Table 1.Data Sources and Definitions of the Variables

Variable	Data Source	Variable Description
GDP_growth	*World Development Indicators* (WDI) (World Bank, 2013)	The average of the annual percentage of the GDP growth rate at market prices based on constant local currency for the five years from 2008 to 2012.
GDP_PC_growth	*World Development Indicators* (WDI) (World Bank, 2013)	The average of the annual percentage of the GDP per capita growth rate based on constant local currency for the five years from 2008 to 2012.
GNI_PC_PPP	*World Development Indicators* (WDI) (World Bank, 2013)	The average of GNI per capita based on purchasing power parity (PPP) for the five years from 2008 to 2012.Unit: thousand dollars
Employment_5YA	*World Development Indicators* (WDI) (World Bank, 2013)	*Employment to population ratio, 15+, total (%) (modeled ILO estimate).We took the five years average from 2008 to 2012.Indicator code: SL.EMP.TOTL.SP.ZS*
Trade_5YA	*World Development Indicators* (WDI) (World Bank, 2013)	Trade (% of GDP).We took the five years average from 2008 to 2012.Indicator Code: NE.TRD.GNFS.ZS
CPI_5YA; CPI2011R; CPI2010R:	*Corruption Perception Index* (CPI) (Transparency International, 2008–2012)	Transparency International (2008 to 2012) corruption indices from the CPI. The original CPI between 2008 and 2010 ranged from 1 (most corrupt) to 10 (most clean).The CPI in 2011 and 2012 ranged from 0 (most corrupt) to 100 (most clean).We first transferred the CPI in 2011 and 2012 to ranges between 0 and 10 by dividing the CPI by 10.We then reverse coded the CPI by subtracting the CPI from 11 so that a higher score indicates more corruption, thus making it easier to interpret the test results.*Corruption_5YA* is the average of the transformed CPI score for the five years from 2008 to 2012.We also took the rescaled score in 2011 (*CPI2011R*) and 2010 (*CPI2010R*) in our analysis.
ICRG2012R	*International Country Risk Guide (ICRG)* (PRS Group, Inc.)	The corruption indicator from Political Risk component. It is ranged from 0 (most corrupt) to 6 (most clean).We rescaled it with a higher score indicating more corrupt.
CoCorrupt2011R; CoCorrupt2010R	Worldwide Governance Indicators (WGI) (World Bank, 2013)	*Control of Corruption*, ranges from approximately -2.5 (weak) to 2.5 (strong) governance performance. We reverse coded it so that a higher score shows more corruption. We took the value from 2011 and 2010.
Autocracy, Anocracy, Democracy	Polity IV Project: Political Regime Characteristics and Transitions, 1800–2012	The measurement of Autocracy and Anocracy is converted from the polity score in the Polity IV Project: Political Regime Characteristics and Transitions, 1800–2012.The polity score ranges from -10 (hereditary monarchy) to +10 (consolidated democracy).The Polity IV Project also groups countries into full democracies (polity=10), democracies (polity scores ranging from 6 to 9), open anocracies (polity score ranging from 1 to 5), closed anocracies (polity scores ranging from -5 to 0), and autocracies (-10 to -6).In addition, some countries have polity scores of (-88), (-77), and (-65), which means that the country is either undergoing transition, or it has failed, or it is occupied. We took the polity score in 2011 and grouped full democracy and democracy to form our democracy (polity scores ranging from 6 to 10), grouped open anocracy and closed anocracy to form our anocracy (polity scores ranging from -5 to 5).Our autocracy is the same as that in the Polity IV Project (polity scores ranging from -10 to -6).We excluded transitional, failed, or occupied countries.
Literacy	UNESCO Institute for Statistics, in *EdStats,* January 2014	Literacy is the national adult literacy rate (15+) from the UNESCO Institute for Statistics in *EdStats.* Many countries have missing data. Therefore, the literacy data for most countries are collected for the year 2011.If the 2011 data are missing, the data for the most recent available year are collected.

The regime type includes three categories: Autocracy, Anocracy, and Democracy. The measurements for Autocracy, Anocracy, and Democracy are

converted from the 2011 polity score from the Polity IV Project, the most widely used data source for the study of political regimes (www.systmicpeac.org, 2014).Polity IV Project (The Project thereafter) measures the authority characteristics of states over 194 countries in the world. The Polity score ranges from +10 (strongly democratic) to (-10) (strongly autocratic). Based on polity score, the Project classified countries into five groups: Autocracy with polity scores ranging from (-10) to (-6), Closed Anocracy with polity scores from -5 to 0, Open Anocracy in which polity score is between 1 and 5, Democracy having a polity score between 6 and 9, and Full Democracy with the highest polity score of 10.

In this study, Autocracy, Anocracy, and Democracy are coded as dummy variables based on the scores of Polity IV Project. Democracy, which combines Democracy and Full Democracy from The Project, equals to 1 if the polity score is 6 or greater, otherwise 0.Anocracy (including Closed Anocracy and Open Anocracy) is 1 if the polity score ranges from -5 to 5, otherwise 0.In the same fashion, Autocracy is 1 if the polity score is between -10 and -6, and otherwise 0 (The detailed county classification is Appendix A).

We control for income level (GNI per capita), the level of human capital through education, employment to population ratio and trade to GDP ratio. Income level is measured by GNI per capita, which is taken from World Development Indicators developed by the World Bank. We use the literacy rate to measure education, which is the national adult literacy rate (age 15+) as measured by the UNESCO Institute for Statistics *in EdStats*. Employment to population ratio and trade to GDP ratio are both collected from the World Development Indicators of the World Bank. More detailed descriptions and measurements of the variables are available in Table 1.

4. DATA ANALYSIS AND FINDINGS

4.1 DESCRIPTIVE AND CORRELATION ANALYSES

The data description and correlation matrix are shown in Table 2.The correlations of the six measurement of Corruption are significantly high, ranged from 0.898 to 0.996.But they will not appear in the same regression, but, rather, used as a check of robustness. GDP_growth and GDP_PC_growth, the two dependent variables, are highly correlated (0.885).Similarly, they will be used separately in the different models. Thus these high correlations do not cause any multicollinearity concerns. But the high correlation between corruption measures and GNI_PC_PPP may lead to multicollinearity. Thus we check the variance inflation factor (VIF) for any possible multicollinearity between them.

We first compare the levels of corruption, economic growth rates, and economic development among the different regime types, as shown in Table 3.As can be seen, the Corruption Perception Index (CPI) measured corruption levels in these three regime types are significantly different from one another. Though the difference measured by ICRG and Control of Corruption in anocractic and autocratic countries are not significant, the corruption level is the highest in anocractic countries and it is the lowest in democratic regimes, lending support to Hypotheses 1a and 1b.

Table 2.Data Description and Correlation Matrix

		1	2	3	4	5	6	7	8
1	GDPgrowth_5YA	1							
2	GDP_PC_growth_5YA	**0.883**	1						
3	GNI_PC_PPP_5YA	**-0.441**	**-0.381**	1					
4	Literacy	**-0.254**	-0.056	**0.512**	1				
5	Employment_5YA	**0.353**	0.136	-0.134	**-0.322**	1			
6	Trade_5YA	-0.032	-0.023	**0.401**	**0.303**	-0.124	1		
7	Autocracy	**0.224**	0.083	-0.110	**0.200**	0.082	0.002	1	
8	Anocracy	**0.212**	0.121	**-0.342**	**-0.368**	**0.195**	-0.095	**-0.167**	1
9	Polity2011	**-0.352**	-0.121	**0.370**	0.072	**-0.226**	-0.021	**-0.731**	**-0.386**
10	CPI_5YA	**0.407**	**0.379**	**-0.842**	**-0.337**	0.081	**-0.296**	0.128	**0.361**
11	CPI2011R	**0.390**	**0.374**	**-0.844**	**-0.322**	0.050	**-0.290**	0.113	**0.337**
12	CPI2010R	**0.383**	**0.364**	**-0.848**	**-0.359**	0.065	**-0.308**	0.090	**0.357**
13	ICRG2012R	**0.383**	**0.372**	**-0.777**	**-0.284**	0.007	**-0.269**	0.125	**0.306**
14	CoCorrupt2011R	**0.349**	**0.298**	**-0.770**	**-0.328**	0.080	**-0.277**	0.167	**0.353**
15	CoCorrupt2010R	**0.358**	**0.324**	**-0.765**	**-0.327**	0.074	**-0.281**	0.144	**0.351**
		8	9	10	11	12	13	14	15
9	Polity2011	**-0.386**	1						
10	CPI_5YA	**0.361**	**-0.386**	1					
11	CPI2011R	**0.337**	**-0.355**	**0.995**	1				
12	CPI2010R	**0.357**	**-0.354**	**0.996**	**0.994**	1			
13	ICRG2012R	**0.306**	**-0.399**	**0.920**	**0.929**	**0.911**	1		
14	CoCorrupt2011R	**0.353**	**-0.427**	**0.907**	**0.907**	**0.898**	**0.951**	1	
15	CoCorrupt2010R	**0.351**	**-0.401**	**0.909**	**0.909**	**0.903**	**0.946**	**0.993**	1
		1	2	3	4	5	6	7	8
	N	191	191	133	144	168	175	210	210
	Mean	3.21	1.74	13.42	82.14	58.97	94.45	0.10	0.21
	SD	3.28	2.96	13.46	19.25	11.74	51.80	0.29	0.41
	Minimum	-13.93	-17.56	0.31	25.30	31.58	24.63	0.00	0.00
	Maximum	15.10	12.49	49.73	100.00	86.62	422.39	1.00	1.00
		9	10	11	12	13	14	15	
	N	158	176	176	171	136	197	197	
	Mean	4.09	6.88	6.92	6.95	3.41	-0.01	-0.02	
	SD	6.24	2.06	2.10	2.09	1.20	1.00	1.00	
	Minimum	-10.00	1.71	1.54	1.70	0.50	-2.45	-2.41	
	Maximum	10.00	10.10	9.99	9.60	5.50	1.68	1.68	

Correlations in bold are significant at 0.05 level.

We also see from Table 3 that economic growth, measured by both the GDP growth rate and the GDP per capita growth rate, is significantly higher in

autocratic and anocratic regimes than it is in democratic regimes, thus supporting H2a.Both the GDP growth rate and the GDP per capita growth rate in autocratic regimes are higher than they are in anocratic regimes (with autocracies' GDP per capita growth rate significantly higher than that of anocracies).Thus, although preliminary, we can say that these results support H2b.

4.2 REGRESSION ANALYSES

To further test the hypotheses using multivariate analysis, we ran a series of regression models. Panel A of Table 4 shows the results of six regression models to test H1a and H1b.Each model has one measurement of corruption as dependent variable. The independent variables are all the same. Four control variables are included: GNI_PC_PPP, Literacy, Employment and Trade. Two variables of interest, Autocracy and Anocracy (the base line type is Democracy) are also incorporated. In all six models, the variance inflation factors (VIFs) were checked and the fact that they are all below the cutoff value of 10 rules out any concerns about multicollinearity (Hair *et al*., 1998).As shown in all six models, the coefficients for Autocracy and Anocracy are all positive, showing that democratic regimes (the baseline) have the lowest level of corruption. Hypothesis 1a is strongly supported. With respect to Autocracy and Anocracy, the standardized coefficients for Autocracy are smaller than those for Anocracy in Model 1 and Model 3 but bigger in other models. Therefore Hypothesis 1b is only partially supported.

Table 3.Group Comparison

	G1: Autocracy (N=20)	G2: Anocracy (N=44)	G3: Democracy (N=94)	T (G1, G2)	T (G2, G3)	T (G1, G3)
GDPgrowth_5YA	5.415	4.354	2.695	1.10*	3.11[+]	3.93[+]
GDP_PC_growth_5 YA	2.479	2.288	1.629	0.19	1.34**	1.33**
GNI_PC_PPP_5YA	8.523	5.312	16.160	0.99*	-4.47[+]	-1.87**
CPI_5YA	7.608	8.231	6.272	-1.66**	5.66[+]	2.65***
CPI2011R	7.582	8.223	6.363	-1.68**	5.16[+]	2.32**
CPI2010R	7.479	8.298	6.338	-2.09**	5.46[+]	2.16**
ICRG2012R	3.833	4.097	3.077	-1.01	4.36[+]	2.24**
CoCorrupt2011R	0.480	0.668	-0.226	-0.88	5.28[+]	2.98***
CoCorrupt2010R	0.408	0.659	-0.213	-1.14	5.12[+]	2.58***

*p< 0.1; **p<0.05; ***p<0.01; [+]p<0.001 (all1-tailed).

To further ascertain the nonlinear relationship between regime type and corruption, we ran a regression with Polity score (ranging from -10 to 10) and Polity score squared as independent variables and corruption as dependent variables, controlling for income level, education level, employment ratio and trade ratio (see panel B of Table 4).The results support Hypotheses 1a and 1b: corruption increases from autocracies to anocracies, peaks near the mid-level anocracy (around Polity score of -2 when corruption measured by CPI, or -1

when corruption measured by other methods), and declines from there on into democracy.

To test Hypotheses 2a and 2b, we ran a series regression models shown in Table 5. Panel A of Table 5 has GDP growth rate (GDP_growth) as dependent variable, and in Panel B the dependent variable was changed to GDP per capita growth rate (GDP_PC_growth).In each Panel, six regressions were conducted. In each regression, the same four control variables (GNI_PC_PPP, Literacy, Employment to Population Ratio and Trade to GDP Ratio) were included. The variables of interest, Corruption, Autocracy, and Anocracy (the baseline is still Democracy) were also added. Each model uses one measurement of corruption. In all 12 models, the variance inflation factors (VIF) are below the cutoff value of 10 (Hair *et al.,* 1998), ruling out serious concerns over multicollinearity.

Table 4.Multiple Regressions on Corruption (Panel A)

	Panel A								
Models	**Model 1**			**Model 2**			**Model 3**		
DV	**CPI_5YA**			**CPI2011R**			**CPI2010R**		
IV	B	SE.	Beta	B	SE.	Beta	B	SE.	Beta
(Constant)	7.348[+]	0.914		7.848[+]	0.934		7.496[+]	0.914	
GNI_PC_PPP_5YA	-0.084[+]	0.013	-0.606	-0.089[+]	0.013	-0.639	-0.090[+]	0.013	-0.632
Literacy	0.007	0.007	0.093	0.007	0.007	0.090	0.008	0.007	0.100
Employment_5YA	0.008	0.009	0.074	0.002	0.009	0.020	0.007	0.009	0.061
Trade_5YA	-0.004**	0.002	-0.146	-0.004*	0.002	-0.127	-0.004**	0.002	-0.144
Autocracy	0.650**	0.353	**0.137**	0.547*	0.361	**0.115**	0.616**	0.353	**0.128**
Anocracy	0.459**	0.237	**0.152**	0.330*	0.242	**0.109**	0.456**	0.236	**0.148**
N	106			106			106		
Adjusted R Square	0.485			0.470			0.506		
F	17.475[+]			16.499[+]			18.917[+]		
Models	**Model 4**			**Model 5**			**Model 6**		
DV	**ICRG2012R**			**CoCorrupt2011R**			**CoCorrupt2010R**		
IV	B	SE.	Beta	B	SE.	Beta	B	SE.	Beta
(Constant)	4.437[+]	0.802		0.337	0.562		0.312	0.568	
GNI_PC_PPP_5YA	-0.040[+]	0.011	-0.470	-0.044[+]	0.008	-0.575	-0.043[+]	0.008	-0.565
Literacy	-0.002	0.006	-0.034	0.001	0.004	0.032	0.002	0.004	0.043
Employment_5YA	-0.003	0.008	-0.040	0.003	0.006	0.057	0.004	0.006	0.061
Trade_5YA	-0.001	0.002	-0.063	-0.001	0.002	-0.034	-0.001	0.002	-0.049
Autocracy	0.479*	0.332	**0.149**	0.392**	0.217	**0.151**	0.381**	0.219	**0.147**
Anocracy	0.068	0.189	**0.038**	0.109	0.145	**0.066**	0.096	0.147	**0.058**
N	86			106			106		
Adjusted R Square	0.222			0.354			0.342		
F	5.034[+]			10.556[+]			10.083[+]		

*p< 0.1; **p<0.05; ***p<0.01; [+]p<0.001 (all1-tailed).B: Unstandardized coefficients; S.E.: Standard error; Beta: Standardized coefficients.

As shown in Table 5, the coefficients for corruption are all negative (significant when corruption is measured by CPI) which shows that corruption negatively affects economic growth. The coefficients for Autocracy and Anocracy are all positive in all 12 models and mostly significant, indicating that autocratic and anocratic regimes have higher economic growth rates than democratic regimes, providing support for Hypothesis 2a.Furthermore, the

coefficients for Autocracy are higher than those for Anocracy in all 12 models, thus also supporting Hypothesis 2b.

Hypothesis 3 is tested by running the models shown in Table 6.The dependent variables are GDP growth rate (GDP_growth) in Panel A and GDP per capita growth (GDP_PC_growth) in Panel B. In Table 6 we add two interaction terms to Table 5—Corruption X Autocracy and Corruption X Anocracy—to test the moderating effects of regime type on corruption and economic growth.

Table 4.Multiple Regressions on Corruption (Panel B)

Panel B									
Models	Model 1			Model 2			Model 3		
DV	CPI_5YA			CPI2011R			CPI2010R		
IV	B	SE.	Beta	B	SE.	Beta	B	SE.	Beta
(Constant)	7.541[+]	0.851		7.902[+]	0.897		7.806[+]	0.872	
GNI_PC_PPP_5YA	-0.117[+]	0.015	-0.706	-0.119[+]	0.016	-0.719	-0.117[+]	0.015	-0.697
Literacy	0.02***	0.007	0.241	0.017***	0.007	0.232	0.017***	0.007	0.230
Employment_5YA	0.004	0.008	0.034	-0.002	0.009	-0.013	0.002	0.009	0.021
Trade_5YA	-0.003*	0.002	-0.114	-0.003	0.002	-0.095	-0.004*	0.002	-0.123
Polity2011	**-0.034****	0.020	-0.142	**-0.025**	0.021	-0.107	**-0.030***	0.021	-0.123
Polity x Polity	**-0.008****	0.004	-0.173	**-0.007***	0.004	-0.157	**-0.008****	0.004	-0.185
N	98			98			98		
Adjusted R Square	0.59			0.545			0.581		
F	24.295+			20.366+			23.446+		
Models	Model 4			Model 5			Model 6		
DV	ICRG2012R			CoCorrupt2011R			CoCorrupt2010R		
IV	B	SE.	Beta	B	SE.	Beta	B	SE.	Beta
(Constant)	4.180[+]	0.758		0.470	0.547		0.451	0.552	
GNI_PC_PPP_5YA	-0.044[+]	0.012	-0.467	-0.047[+]	0.009	-0.534	-0.046[+]	0.010	-0.519
Literacy	0.009*	0.006	0.190	0.009**	0.004	0.222	0.009**	0.004	0.235
Employment_5YA	-0.004	0.008	-0.049	0.000	0.005	0.000	0.000	0.006	0.001
Trade_5YA	-0.001	0.002	-0.085	-0.001	0.002	-0.092	-0.002	0.002	-0.111
Polity2011	**-0.011**	0.021	-0.076	**-0.016**	0.013	-0.123	**-0.015**	0.013	-0.120
Polity x Polity	**-0.008****	0.004	-0.303	**-0.006****	0.003	-0.269	**-0.006****	0.003	-0.273
N	81			98			98		
Adjusted R Square	0.318			0.404			0.393		
F	7.225[+]			11.94[+]			11.459[+]		

*p< 0.1; **p<0.05; ***p<0.01; [+]p<0.001 (all1-tailed).B: Unstandardized coefficients; S.E.: Standard error; Beta: Standardized coefficients.

The results in Table 6 are quite interesting. The first observation, which is our main interest in this study, is that the coefficients for Anocracy X Corruption are always negative in all 12 models and mostly significant (in 8 out 12 models), which indicates the combination of corruption and anocracy hurts economic growth. Meanwhile, in Panel B when the dependent variable is GDP per capita growth, the coefficients for Autocracy X Corruption are always positive and significant while in Panel A, most of them are positive (4 out of 6 models), which indicates that the combination of corruption and autocracy enhances economic growth. In other words, the combination of corruption and anocracy hurts economic growth more than the combination of corruption and autocracy. Our hypothesis (H3) that corruption hurts anocracy more than it

hurts autocracy is supported. Another equally insightful finding is that the co-efficients for Autocracy are always smaller than those for Anocracy, implying that after controlling for the interaction between corruption and regime type, Anocracy may achieve higher economic growth than Autocracy.

4.3 ROBUSTNESS MEASURES AND CHECKS

To assure that our testing results are robust, we used a five-year average. We further assessed the robustness of our tests by varying the ranges used to calculate the average. In the models above, most variables are the average values of the five years between 2008 and 2012.To check the robustness of these models, we used the average values of the three years between 2010 and 2012 and the three years between 2008 and 2010, and then we reran all the above analyses. The reruns confirm our test models (available upon request).

Table 5.Multiple Regressions on Economic Growth (Panel A)

Panel A: Dependent Variable: GDPgrowth_5YA

Models	Model 1			Model 2			Model 3		
Corruption Measure	CPI_5YA			CPI2011R			CPI2010R		
IV	B	SE.	Beta	B	SE.	Beta	B	SE.	Beta
(Constant)	4.47*	2.75		5.13**	2.76		4.75**	2.75	
GNI_PC_PPP_5YA	-0.20+	0.05	-0.61	-0.20+	0.05	-0.64	-0.20+	0.05	-0.62
Literacy	-0.01	0.016	-0.04	-0.01	0.02	-0.04	-0.01	0.02	-0.04
Employment_5YA	0.05***	0.02	0.24	0.05***	0.02	0.22	0.05***	0.02	0.23
Trade_5YA	0.01**	0.01	0.20	0.01**	0.01	0.20	0.01**	0.01	0.20
Autocracy	**1.93****	0.81	0.21	**1.92*****	0.80	0.21	**1.93*****	0.80	0.21
Anocracy	**0.92****	0.55	0.16	**0.89***	0.54	0.15	**0.93****	0.55	0.16
Corruption	**-0.43****	0.25	-0.22	**-0.48****	0.23	-0.25	**-0.45****	0.24	-0.24
N	101			101			101		
Adjusted R Square	0.35			0.36			0.35		
F	8.54+			8.83+			8.66+		
Models	Model 4			Model 5			Model 6		
Corruption Measure	ICRG2012R			CoCorrupt2011R			CoCorrupt2010R		
IV	B	SE.	Beta	B	SE.	Beta	B	SE.	Beta
(Constant)	4.82*	2.97		1.41	2.12		1.41	2.12	
GNI_PC_PPP_5YA	-0.17+	0.04	-0.55	-0.15+	0.04	-0.469	-0.15+	0.04	-0.47
Literacy	-0.02	0.02	-0.12	-0.01	0.02	-0.072	-0.01	0.02	-0.07
Employment_5YA	0.04*	0.03	0.15	0.05***	0.02	0.230	0.05***	0.02	0.23
Trade_5YA	0.01**	0.01	0.23	0.01**	0.01	0.221	0.01**	0.01	0.22
Autocracy	**2.50*****	1.04	0.25	**1.66****	0.82	0.183	**1.66****	0.82	0.18
Anocracy	**0.46**	0.59	0.08	**0.71***	0.55	0.121	**0.71***	0.55	0.12
Corruption	**-0.44**	0.36	-0.14	**-0.11**	0.38	-0.030	**-0.12**	0.38	-0.03
N	81			101			101		
Adjusted R Square	0.32			0.33			0.33		
F	6.31+			7.88+			7.88+		

*p< 0.1; **p<0.05; ***p<0.01; +p<0.001 (all1-tailed).B: Unstandardized coefficients; S.E.: Standard error; Beta: Standardized coefficients.

Still to increase the robustness of our testing result, we rerun all the analyses using the same five polity categories from the Polity IV Project. The rerun results for Panel A of Table 5 could be seen in Appendix B. In all the six models, the default regime type is Full Democracy. All corruption measures are negatively related to DGP growth rate. The coefficients for Autocracy are

highest and significant, coefficients for Closed Anocracy and Open Anocracy are significant but lower than those of Autocracy, while coefficients for Democracy are lowest and most are non-significant, supporting our hypotheses H2a and H2b.Other reruns using the five regime types also confirm our results (available upon request).

5. CONCLUSION

5.1 A NEW PERSPECTIVE ON REGIME TYPE, CORRUPTION, AND ECONOMIC GROWTH

Worldwide corruption has attracted increasing attention from both academics and policy makers for the following reasons. First, if we examine the world map based on the perceived level of corruption developed by Transparency International, which uses different shades of red to indicate the level of corruption (darker red indicates a higher level of corruption), we find that since Transparency International began to draw these maps several decades ago, most of the world is shaded in dark red. Thus we can safely say that many countries are badly infected with corruption, affecting the lives of billions. Unfortunately, this conditions persists and is not easy to clean up.

Yet some countries have achieved high economic growth despite rampant corruption. Which countries fall into this category? Why do their economies thrive despite the high levels of corruption? We offer an explanation that links corruption and political regime type to economic growth. Using large-scale data that cover 158 countries over five years, we show that during the transition stage of political development, when a former dictatorship breaks down and creates a decentralized power structure (as approximated by an anocracy), the level of corruption may increase. At the same time, due to the complementary nature of the bureaucratic power structure, bribe takers fail to deliver the public goods to bribers, thus creating less economic growth than under a dictatorship. Therefore, corruption hurts countries at a transition stage (or infant democracies) more than it hurts countries prior to transition, namely, autocracies. If we elaborate from our results (i.e., the testing of H3 in Table 6), we postulate that if corruption can be kept at bay, an anocracy may achieve higher economic growth than an autocracy. It is the inefficient corruption in anocracies that drags down their economic growth. Corruption hurts economic growth in all societies, but it is most harmful in transitional societies (anocracies).In autocracies, corruption may be less inefficient in the sense that the bribe taker—the dictator—can efficiently deliver public goods to the briber.

One overall conclusion from the study is that political stability (of any kind) would be better both for corruption control and for economic growth. This might be more closely linked to the economics-based argument that corruption is in general considered as harmful for economic growth because it

increases uncertainty and thereby transaction costs faced by firms and other actors in the economy. Either a "well-organized corruption system" associated with autocracies or effective corruption control as in democracies would therefore be alternative means to decrease these costs. On the other hand, breaking the "system" as the authors discuss is extremely difficult, which is shown again in the moderate success of the Chinese government in its anti-corruption campaign.

Table 5. Multiple Regressions on Economic Growth (Panel B)

Panel B: Dependent Variable: GDP_PC_growth_5YA

Models	Model 1			Model 2			Model 3		
Corruption Measure	CPI_5YA			CPI2011R			CPI2010R		
IV	B	SE.	Beta	B	SE.	Beta	B	SE.	Beta
(Constant)	3.20	2.72		3.61*	2.74		3.53*	2.72	
GNI_PC_PPP_5YA	-0.23+	0.05	-0.80	-0.23+	0.05	-0.81	-0.23+	0.05	-0.81
Literacy	0.03**	0.02	0.24	0.03**	0.02	0.23	0.03**	0.02	0.24
Employment_5YA	0.02	0.02	0.10	0.02	0.02	0.09	0.02	0.02	0.10
Trade_5YA	0.01*	0.01	0.18	0.01**	0.01	0.18	0.01*	0.01	0.17
Autocracy	**1.10***	0.80	0.13	**1.06***	0.79	0.13	**1.10***	0.80	0.13
Anocracy	**0.59**	0.55	0.11	**0.53**	0.54	0.10	**0.61**	0.54	0.11
Corruption	**-0.51***	0.25	-0.29	**-0.53***	0.23	-0.30	**-0.54***	0.24	-0.31
N	101			101			101		
Adjusted R Square	0.22			0.23			0.23		
F	4.98+			5.13+			5.12+		
Models	Model 4			Model 5			Model 6		
Corruption Measure	ICRG2012R			CoCorrupt2011R			CoCorrupt2010R		
IV	B	SE.	Beta	B	SE.	Beta	B	SE.	Beta
(Constant)	2.07	2.92		-0.43	2.11		-0.42	2.11	
GNI_PC_PPP_5YA	-0.20+	0.04	-0.73	-0.18+	0.04	-0.62	-0.18+	0.04	-0.63
Literacy	0.03*	0.02	0.19	0.03*	0.02	0.19	0.03*	0.02	0.19
Employment_5YA	0.006	0.03	0.03	0.02	0.02	0.09	0.02	0.02	0.10
Trade_5YA	0.01*	0.01	0.22	0.01**	0.01	0.20	0.01**	0.01	0.20
Autocracy	**1.54***	1.02	0.17	**0.79**	0.81	0.10	**0.81**	0.81	0.10
Anocracy	**0.16**	0.58	0.03	**0.34**	0.54	0.06	**0.34**	0.54	0.07
Corruption	**-0.38**	0.35	-0.13	**-0.15**	0.38	-0.05	**-0.19**	0.38	-0.06
N	81			101			101		
Adjusted R Square	0.21			0.19			0.19		
F	**3.99+**			**4.20+**			**4.22+**		

*$p < 0.1$; **$p < 0.05$; ***$p < 0.01$; +$p < 0.001$ (all 1-tailed). B: Unstandardized coefficients; S.E.: Standard error; Beta: Standardized coefficients.

During the late 1980s and early 1990 when several communist states including Russia fell, there was a high exuberant optimism that democracy and free market will soon be realized in the world, highlighted by Fukuyama's seminal piece, "The End of History" (Fukuyama, 1989). Of course, what happened afterwards shows history is far from ending. Our study further demonstrates that the road to democracy is bumpy and the trajectory is not linear; the economy may suffer from a worsening corruption before it gets better.

Table 6.Multiple Regressions of Interactions on Economic Growth (Panel A)

Panel A: Dependent Variable: GDPgrowth_5YA

Models	Model 1			Model 2			Model 3		
Corruption Measure	CPI_5YA			CPI2011R			CPI2010R		
IV	B	SE.	Beta	B	SE.	Beta	B	SE.	Beta
(Constant)	2.606	2.80		3.431	2.81		2.924	2.79	
GNI_PC_PPP_5YA	-0.187+	0.05	-0.59	-0.197+	0.05	-0.62	-0.193+	0.05	-0.61
Literacy	0.001	0.02	0.00	0.001	0.02	0.001	0.001	0.02	0.01
Employment_5YA	0.052***	0.02	0.23	0.047**	0.02	0.21	0.051***	0.02	0.23
Trade_5YA	0.005	0.01	0.09	0.006	0.01	0.11	0.005	0.01	0.09
Autocracy	**1.621**	5.00	0.18	**2.507**	4.74	0.28	**1.839**	5.29	0.20
Anocracy	**8.361***	3.14	1.43	**7.822***	3.08	1.34	**8.233***	3.12	1.41
Corruption	**-0.152**	0.27	-0.08	**-0.217**	0.26	-0.11	**-0.192**	0.26	-0.10
Autocracy x Corruption	**0.013**	0.62	0.01	**-0.092**	0.59	-0.08	**-0.012**	0.66	-0.01
Anocracy x Corruption	**-0.949***	0.40	-1.33	**-0.881****	0.39	-1.23	**-0.922****	0.39	-1.30
N	101			101			101		
Adjusted R Square	0.379			0.382			0.381		
F	7.646+			7.742+			7.707+		
Models	Model 4			Model 5			Model 6		
Corruption Measure	ICRG2012R			CoCorrupt2011R			CoCorrupt2010R		
IV	B	SE.	Beta	B	SE.	Beta	B	SE.	Beta
(Constant)	4.112*	3.09		1.633	2.09		1.657	2.08	
GNI_PC_PPP_5YA	-0.146+	0.05	-0.49	-0.108***	0.05	-0.34	-0.110***	0.04	-0.35
Literacy	-0.021	0.02	-0.15	-0.015	0.02	-0.10	-0.015	0.02	-0.10
Employment_5YA	0.040*	0.03	0.16	0.051***	0.02	0.23	0.051***	0.02	0.23
Trade_5YA	0.010*	0.01	0.18	0.009*	0.01	0.16	0.010*	0.01	0.17
Autocracy	**-0.851**	5.59	-0.08	**0.658**	1.08	0.07	**0.446**	1.10	0.05
Anocracy	**2.763**	2.61	0.49	**1.146****	0.59	0.20	**1.116****	0.59	0.19
Corruption	**-0.198**	0.46	-0.06	**0.475**	0.52	0.13	**0.413**	0.52	0.12
Autocracy x Corruption	**0.834**	1.39	0.33	**1.256**	1.23	0.13	**1.64**	1.27	0.16
Anocracy x Corruption	**-0.61**	0.67	-0.43	**-1.172****	0.68	-0.23	**-1.086***	0.67	-0.21
N	81			101			101		
Adjusted R Square	0.312			0.351			0.354		
F	5.024+			6.878+			6.968+		

*p< 0.1; **p<0.05; ***p<0.01; +p<0.001 (all1-tailed).B: Unstandardized coefficients; S.E.: Standard error; Beta: Standardized coefficients.

The fall of the Mubarak regime in Egypt and the Assad regime in Syria are two recent examples of moves from autocracy to anocracy. As the regimes fell, so did many of the supporting mechanisms that held the leaders in power. In 2013 democracy appeared in Egypt under the banner of the Islamic Brotherhood, but shortly thereafter it was circumvented by a military dictatorship that promised future elections and governance accountability. We expect that under these conditions of anocracy, corruption in both Syria and Egypt will grow and stymie economic growth. The political instability during Ukraine's attempt to democratize in recently years which eventually led to the intervention from both Russia and the West (mainly the United States and the EU) provides another example. The power split has been leading to a fractionalization of society (traditionalists vs. modernizers) along geographic boundaries. We anticipate that recent events in Ukraine (if they remain unresolved) will lead to additional corruption and economic inefficiencies.

**Table 6.Multiple Regressions of Interactions on Economic Growth
(Panel B)**

Panel B: Dependent Variable: GDP_PC_growth_5YA

Models	Model 1			Model 2			Model 3		
Corruption Measure	CPI_5YA			CPI2011R			CPI2010R		
IV	B	SE.	Beta	B	SE.	Beta	B	SE.	Beta
(Constant)	1.928	2.70		2.431	2.71		2.07	2.69	
GNI_PC_PPP_5YA	-0.191[+]	0.05	-0.66	-0.194[+]	0.05	-0.68	-0.19[+]	0.05	-0.67
Literacy	0.028**	0.02	0.21	0.027**	0.02	0.21	0.03**	0.02	0.22
Employment_5YA	0.025	0.02	0.12	0.022	0.02	0.11	0.03	0.02	0.12
Trade_5YA	0.004	0.01	0.07	0.004	0.01	0.08	0.01	0.01	0.06
Autocracy	**-9.95****	4.82	-1.21	**-8.82****	4.58	-1.07	**-10.42****	5.08	-1.27
Anocracy	**6.17****	3.03	1.17	**5.78****	2.97	1.09	**6.23****	3.00	1.18
Corruption	**-0.314**	0.26	-0.18	**-0.345***	0.25	-0.20	**-0.33***	0.25	-0.19
Autocracy x Corruption	**1.369****	0.60	1.35	**1.227****	0.57	1.21	**1.42****	0.63	1.41
Anocracy x Corruption	**-0.711****	0.38	-1.10	**-0.667****	0.37	-1.03	**-0.71****	0.37	-1.11
N	101			101			101		
Adjusted R Square	0.297			0.297			0.303		
F	5.608[+]			5.604[+]			5.732[+]		
Models	Model 4			Model 5			Model 6		
Corruption Measure	ICRG2012R			CoCorrupt2011R			CoCorrupt2010R		
IV	B	SE.	Beta	B	SE.	Beta	B	SE.	Beta
(Constant)	1.719	2.89		-0.106	1.101		-0.00	1.98	
GNI_PC_PPP_5YA	-0.159[+]	0.04	-0.58	-0.120***	0.043	-0.418	-0.12***	0.04	-0.43
Literacy	0.015	0.02	0.12	0.014	0.016	0.104	0.013	0.02	0.10
Employment_5YA	0.019	0.03	0.09	0.024	0.020	0.118	0.023	0.02	0.11
Trade_5YA	0.009*	0.01	0.18	0.008*	0.006	0.154	0.008*	0.01	0.16
Autocracy	**-12.73*****	5.24	-1.37	**-1.65****	1.033	-0.201	**-1.89****	1.04	-0.23
Anocracy	**1.281**	2.44	0.25	**0.586**	0.568	0.111	**0.564**	0.56	0.11
Corruption	**-0.331**	0.43	-0.11	**0.104**	0.500	0.032	**0.033**	0.49	0.01
Autocracy x Corruption	**3.61*****	1.31	1.55	**3.82*****	1.173	0.430	**4.24**[+]	1.21	0.47
Anocracy x Corruption	**-0.31**	0.63	-0.24	**-0.66**	0.651	-0.143	**-0.60**	0.64	-0.13
N	81			101			101		
Adjusted R Square	0.273			0.279			0.292		
F	4.340[+]			5.204[+]			5.481[+]		

*p< 0.1; **p<0.05; ***p<0.01; [+]p<0.001 (all1-tailed). B: Unstandardized coefficients; S.E.: Standard error; Beta:
Standardized coefficients.

5.2 POLICY IMPLICATIONS

In recent years, against the backdrop that some countries have achieved rapid economic growth under dictatorship and some newly democratized countries have experienced economic difficulties, the idea that a dictatorship is superior to a democracy in terms of economic growth has been gaining popularity.

This argument fails to consider the relationship between regime type and corruption, and thus it fails to help us understand why infant democracies tend to experience economic difficulties. This argument is also misleading in its conclusion that dictatorship is a superior political system in terms of delivering economic growth because the argument fails to take into consideration the role of corruption and its interactions with the regime type. The surge in corruption during transition is a by-product and thus should not be used as an

excuse for not undergoing transition. This is merely a convenient excuse for dictators to suppress democratization.

China's strong authoritarian state is used as an explanation of why it has performed better than Russia, at least economically. The longevity of the communist party's monopoly on political power partially explains its economic gains. The argument advanced here is that authoritarian corruption is more efficient than dispersed or diffused corruption. Ironically, the Chinese government blames deviant individuals for corruption, rather than a flawed system, which is reminiscent of the Soviet Union era (Larsson, 2006).

Policy makers in mature democracies and international agencies should promote democratization and at the same time they should help those countries undergoing transition to limit the period of chaos or anocracy. In addition, the policy makers in transition countries also should make efforts to curb corruption in fledgling democracies and to restructure their bureaucracies to minimize complementarities that tend to maximize corruption by government agencies.

5.3 WHAT IS NEXT? FUTURE RESEARCH

Our study represents a first attempt in this research direction. Much more needs to be studied to fully understand the relationship between regime type and corruption. For example, we need to further examine the mechanism of corruption to provide a microscopic look at how the corruption-bribery relationship differs in various social environments (Li & Ouyang, 2007; Li & Wu, 2010).We should also examine how a social culture moderates the effects of corruption on economic growth. A related topic is the organizational capacity of the state, or state capacity. We should examine those factors that determine state governance in order to better understand why some countries are governed more efficiently by dictatorial governments. We should also study governance during the period of transition in order to find ways to minimize the governance vacuum that is often associated with transition. More attention should be directed towards the social cost of corruption, because even if it may be less harmful economically in autocracies, it increases social discontents towards corrupt officials and undermines social moral.

Finally, joining the tenacious efforts of scholars and policy makers who are determined to fight against corruption, our study suggests that we are not losing the war in the sense that there are more non-democratic countries embarking on democratization than democratic countries retreating to autocracy. As we show here, democratization ultimately leads to low corruption. The challenge is to how to effectively complete the transition while keeping corruption in check.

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APPENDIX A. COUNTRIES BY REGIME TYPE

Autocracy (n=20)[1]	Anocracy (n=44)		Democracy (n=94)		
Autocracy (n=20)[2]	Closed Anocracy (n=25)	Open Anocracy (n=19)	Democracy (n=60)		Full Democracy (n=34)
Azerbaijan	Angola	Algeria	Albania	Latvia	Australia
Bahrain	Burkina Faso	Armenia	Argentina	Lebanon	Austria
Belarus	Cameroon	Bangladesh	Belgium	Lesotho	Canada
China	Central African Republic	Bhutan	Benin	Liberia	Cape Verde
Cuba	Chad	Cambodia	Bolivia	Macedonia	Chile
Eritrea	Congo Kinshasa	Congo Brazza-ville	Botswana	Malawi	Costa Rica
Iran	Egypt	Djibouti	Brazil	Malaysia	Cyprus
Kazakhstan	Equatorial Guinea	Ecuador	Bulgaria	Mali	Denmark
Korea (North)	Ethiopia	Gabon	Burundi	Mexico	Finland
Kuwait	Fiji	Guinea	Colombia	Moldova	Germany
Laos	Gambia	Iraq	Comoros	Montenegro	Greece
Oman	Jordan	Madagascar	Croatia	Namibia	Hungary
Qatar	Mauritania	Mozambique	Czech Republic	Nepal	Ireland
Saudi Arabia	Morocco	Nigeria	Dominican Republic	Nicaragua	Israel
Swaziland	Myanmar	Papua New Guinea	El Salvador	Niger	Italy
Syria	Rwanda	Russia	Estonia	Pakistan	Japan
Turkmenistan	Singapore	Sri Lanka	France	Panama	Lithuania
UAE	South Sudan	Suriname	Georgia	Paraguay	Luxembourg
Uzbekistan	Sudan	Zimbabwe	Ghana	Peru	Mauritius
Vietnam	Tajikistan		Guatemala	Philippines	Mongolia
	Tanzania		Guinea-Bissau	Romania	Netherlands
	Togo		Guyana	Senegal	New Zealand
	Uganda		Honduras	Serbia	Norway
	Venezuela		India	Sierra Leone	Poland
	Yemen		Indonesia	Solomon Islands	Portugal
			Jamaica	South Africa	Slovak Republic
			Kenya	Thailand	Slovenia
			Korea (South)	Turkey	Spain
			Kosovo	Ukraine	Sweden
			Kyrgyzstan	Zambia	Switzerland
					Trinidad and Tobago
					United Kingdom
					United States
					Uruguay

1. The three categories are the authors converted from The Polity IV Project. 2. The five categories are classified by The Polity IV Project.

APPENDIX B. Rerun of Panel A of Table 5 using Five Categories of Regime Type

Dependent Variable: GDPgrowth_5YA

Models	Model 1			Model 2			Model 3		
Corruption Measure	**CPI_5YA**			**CPI2011R**			**CPI2010R**		
IV	B	SE.	Beta	B	SE.	Beta	B	SE.	Beta
(Constant)	4.186*	2.63		4.732**	2.64		4.473**	2.62	
GNI_PC_PPP_5YA	-0.165+	0.05	-0.53	-0.170+	0.05	-0.54	-0.168+	0.05	-0.54
Literacy	-0.006	0.02	-0.04	-0.006	0.02	-0.04	-0.006	0.02	-0.04
Employment_5YA	0.049***	0.02	0.24	0.046**	0.02	0.22	0.048***	0.02	0.23
Trade_5YA	0.009*	0.01	0.15	0.009	0.01	0.15	0.008*	0.01	0.15
Autocracy	**2.522***	0.96	**0.29**	**2.524***	0.94	**0.29**	**2.569***	0.95	**0.30**
Closed Anocracy	**1.783**	0.85	**0.27**	**1.769**	0.84	**0.27**	**1.833**	0.85	**0.28**
Open Anocracy	**1.773**	0.90	**0.21**	**1.750**	0.89	**0.21**	**1.853**	0.90	**0.22**
Democracy	**0.699**	0.68	**0.13**	**0.724**	0.68	**0.14**	**0.749**	0.68	**0.14**
Corruption	**-0.420**	0.25	**-0.22**	**-0.465**	0.23	**-0.25**	**-0.454**	0.24	**-0.25**
N	101			101			101		
Adjusted R Square	0.33			0.337			0.334		
F	6.466+			6.648+			6.574+		
Models	**Model 4**			**Model 5**			**Model 6**		
Corruption Measure	**ICRG2012R**			**CoCorrupt2011R**			**CoCorrupt2010R**		
IV	B	SE.	Beta	B	SE.	Beta	B	SE.	Beta
(Constant)	4.934**	2.82		1.305	2.03		1.291	2.03	
GNI_PC_PPP_5YA	-0.155+	0.04	-0.51	-0.134+	0.04	-0.43	-0.134+	0.04	-0.43
Literacy	-0.015	0.02	-0.10	-0.01	0.02	-0.07	-0.009	0.02	-0.07
Employment_5YA	0.034*	0.03	0.14	0.047**	0.02	0.23	0.047**	0.02	0.23
Trade_5YA	0.010*	0.01	0.17	0.009*	0.01	0.16	0.009*	0.01	0.16
Autocracy	**3.479***	1.18	**0.34**	**2.391***	0.98	0.28	**2.411***	0.98	0.28
Closed Anocracy	**2.020**	0.96	**0.29**	**1.651**	0.87	0.25	**1.677**	0.87	0.25
Open Anocracy	**1.615**	0.97	**0.20**	**1.694**	0.93	0.20	**1.700**	0.92	0.20
Democracy	**1.019***	0.77	**0.19**	**0.673**	0.71	0.13	**0.692**	0.71	0.13
Corruption	**-0.699**	0.37	**-0.22**	**-0.407**	0.39	-0.12	**-0.425**	0.39	-0.12
N	83			101			101		
Adjusted R Square	0.339			0.316			0.317		
F	5.668+			6.138+			6.160+		

*p< 0.1; **p<0.05; ***p<0.01; +p<0.001 (all1-tailed). B: Unstandardized coefficients; S.E.: Standard error; Beta: Standardized coefficients