Fighting corruption when existing corruption-control levels count : what do wealth effects tell us?

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Abstract

Why are some nations more effective at battling corruption than others? Are there different determinants in the fight against corruption across developing nations? How do wealth effects play-out when existing corruption-control levels matter in the corruption battle? To investigate these concerns we examine the determinants of corruption-control throughout the conditional distribution of the fight against corruption. The following broad findings are established. (1) Population growth is a(an) tool(impediment) in(to) the fight against corruption in Low(Middle) income countries. (2) Democracy increases (decreases) corruption-control in Middle(Low) income countries. As a policy implication, blanket corruption-control strategies are unlikely to succeed equally across countries with different income-levels and political wills in the fight against corruption. Thus to be effective, corruption policies should be contingent on the prevailing levels of corruption-control and income-bracket.

JEL Classification: C10; H10; K10; O10; O55

Keywords: Corruption; Democracy; Government quality; Quantile regression; Africa

1. Introduction

There is growing attention in the realization among international development experts that development requires above all, governance quality. Over the past decades, the issue of corruption and the search for strategies to fight its corrosive effects have grown in importance as a topic of public debate and a criterion by which civil society scrutinizes leadership. Advice on sound policies, well intentioned incentives and aid efforts may not achieve their desired objectives unless they are offered in an environment which stimulates self-sustaining growth and development(Jain,2001). There is also growing realization that unsustainable policies do not always emerge from a deficiency of knowledge about what best policies should be. Rather they could emanate just as much from decision makers distorting economic policies for their own interest(Coolidge & Rose-Ackerman, 1997; Grossman & Helpman, 1994; Krueger 1993a; Krueger 1993b). Corruption is seen by many as one of the principal impediments to the development of an efficient government system; since it is acknowledged as a "*symptom that something has gone wrong in the management of the state*"(Rose-Ackeman,1999, p.9). Even the public acknowledges at large that corruption is the greatest obstacle to economic development(Jain, 2001). There is currently a stream of empirical assessments on the causes and consequences of corruption. Though some consensus is slowly emerging on the determinants of corruption across countries, a number of aspects remain unaddressed. There is lack of consensus on the ability to measure corrupt activity and the difficulty of quantifying the impact of institutions on fighting corruption(Billger & Goel, 2009). The focus of this work is the later concern. Today policies in the fight against corruption espoused by national governments and international organizations happen to be similar across countries. Yet the effectiveness of some of these strategies remain ambiguous (Billger & Goel, 2009).

The present work contributes to the literature by focusing on the distribution of the dependent variables(i.e. control of corruption). Corruption-control(hence CC) determinants and governments' efficacy in combating corruption maybe different across countries such that corrupt and 'clean' countries respond differently to factors that stimulate the fight against corruption. This hypothesis prompts the question of whether there are different determinants of combating corruption in high CC countries as compared to least CC ones. Therefore if existing levels of CC affect how various motives for the fight against corruption come into play, then findings of this paper could have significant implications both for the literature and policy orientation towards the battle against corrupt practices in Africa. It follows that instead of emphasizing on groups of countries with common CC measures, policy could instead target groups of countries with the same CC characteristics(high, low or average). The remainder of the paper is presented as follows. Section 2 reviews existing literature. Data and methodology are presented and outlined respectively in Section 3. Empirical analysis is covered in Section 4. We conclude with Section 5.

2. Existing literature

2.1 Theoretical highlights

Borrowing from Jain(2001), corruption requires three preconditions: discretionary power related to regulations(also see Rose-Ackeman, 1978), economic rents linked to power and sufficiently marginal punishment(Dong et al.,2012). These are the effects of four main theories of corruption. (1) Good and misguided governments establish systems that are very rigid. Venal bureaucrats mould the rules. Corruption diminishes red-tape and if anything improves the allocation of resources (Leff, 1964; Huntington, 1968). (2) Good and smart governments establish systems that are supposed to be rigid. Venal bureaucrats turn-around the rules and

regulations. Corruption reduces bureaucracy and deteriorates allocation efficiency (Laffont & Tirole, 1993). (3) Greedy and smart governments make rules that are very lax and allow bureaucrats more discretion than they should normally enjoy. There is absence of red-tape and no need for any corrupt activity. Efficient allocation of resources suffers a great deal (Shleifer & Vishny,1993). (4) Good and smart governments establish rules that make it tempting for the bureaucrat to take money and turn-around the rules. A bureaucrat introduces red-tape in a bid to bend the rules in a way that protects him/her. Corruption and red-tape move hand in hand.

According to Billger & Goel (2009), the theoretical basis for corruption studies also draw from the larger literature on the determinants of criminal activity, where rational individuals(bribe-givers, bribe-takers …etc) weigh the relative benefits and costs of criminal(corrupt) acts(Becker, 1968). Potential benefits of corruption could include disproportionate favors that monopolist bureaucrats could hand-out(Shleifer & Vishny, 1993) or they may involve cutting(accelerating) bureaucratic red-tape(Guriev, 2004). The differential levels of impatience(discount rates) across economic agents induce some to accept/offer bribes and determine the size of the bribes. Potential costs of indulging in corrupt activity include the cost of apprehension and punishment. Surviving literature does however allow for the possibility that monitoring agencies could themselves be corrupt(Banerjee, 1997).

2.2 Types and levels of corruption: how the stakes involved can influence governance

Based on the context of this paper, it is irrelevant to center the debate on the issue of whether corruption is inherently good or bad. It is more useful to cite which types of corruption have the most corrosive effect on social/economic stability(development). Political leadership plays a crucial role in promoting/discouraging(governing) corrupt activities. To effectively shape this role, it is imperative to move beyond the subjective and qualitative analyses which describe

corruption as a mere moral failing of politicians, bureaucrats and businessmen. Thus it is more useful to consider it as a politico-economic phenomenon.

Corrupt activities are prevalent to some degree in all societies. In recent years however political scientists have aggressively searched to understand the reason some nations and societies are clearly more vulnerable to abusive political and economic opportunism than others. In response they have suggested a number of typologies that indicate links between the incidences of corruption and specific stages of political, economic and social developments (Kpundeh,1998). With respect to some authors, the types and amounts of corruption vary in accordance with a number of factors affecting the relationship between government and civil society(Johnston, 1982). For the purpose of explicitly underlining the objective of our study, it is useful to categorize the phenomenon into three frameworks: incidental, systematic and systemic corruption, as summarized in Table 1(consistent with Kpundeh (1998)). Firstly, Incidental corruption is typical of petty bribery and involves opportunistic individuals or small groups. Within this framework, corruption is the exception rather than the rule. High-level private sector actors and senior officials are seldom disturbed by such theft. Secondly, Systematic corruption is organized, not necessarily pervasive or institutionalized but recurrent. It usually involves large gains which are for the most part subject to popular scandals. Whereas it is entrenched and functions with large a number of officials, intermediaries and entrepreneurs, this form of corruption originates from high-level civil servants that recognize and exploit the illegal ventures and opportunities in government departments and agencies. Hence, this practice is the direct violation of the regulation and rule of law. Thirdly, Systemic corruption is pervasive, institutionalized(perhaps condoned but not necessarily approved), and built into the economic and political institutions. It occurs and flourishes in circumstances where public sector wages fall

below a living threshold. In contrast to systematic corruption, it involves all levels of employment.

Table 1: A Simplified Typology of Corruption

Type	Main Actors	Mode
Incidental	Petty officials, interested officials and opportunistic individuals.	Small size embezzlement and misappropriation, bribes, favoritism and discrimination.
Systematic	Public officials, politicians, representatives of donor and recipient countries, bureaucratic elites, business men and middle men.	Bribery and kickbacks, collusion to defraud the public, large-scale embezzlement and misappropriation through public tender and disposal of public property, economic privileges accorded to special interests, large political donations and bribes.
Systemic	Bureaucratic elites, politicians, business men and white-collar workers.	Large-scale embezzlement through 'ghost worker' on government pay roll, embezzling government funds through false procurement-payment for nonexistent goods, large scale disbursement of public property to special and privileged interest under the pretext of 'national interest', favoritism and discrimination exercised in favor of ruling parties in exchange for political contributions.

Source: Kpundeh(1998)

Therefore from a theoretical standpoint the fight against corruption could be incidental, systematic or systemic. However from a practical view, legislation against corruption often encompasses the three types. Our paper focuses indifferently on the three categories of corruption. This is because, where systemic corruption is present, systematic and incidental corruption are already prevalent; which is the case of most African countries.

2.3 Governance and fight against corruption in Africa

A heated debate has raged on for years over Africa's economic woes. Besides the obvious problems of warfare, drought and disease, the usual suspect is economic policy(Coolidge & Rose-Ackerman, 1997). Corruption remains one of the most daunting challenges for majority of African countries. As supported by several studies and surveys, it is a

major obstacle to economic progress, social welfare, service delivery and good governance in the continent.

Borrowing from the United Nations Economic Commission for Africa(UNECA,2009, p.1), it is estimated that in 2004, the continent lost more than $148 billion to corruption; approximately 25% of its Gross Domestic Product(GDP). More so, the African Development Bank(ADB,2006, p.7) suggests that 50% of tax revenue and $30 billion in aid for Africa ends up in corrupt hands. With respect to the UNECA(2005), corruption ranked as one of the three most serious national problems confronting African countries, the other two being poverty and unemployment. According to the 2009 African Governance Report, corruption seems to have worsened in many Africa countries (UNECA, 2009). Most governance institutions: executive, legislative, judiciary and public service are deemed to be corrupt. In accordance with the report, poor governance, lack of accountability and transparency, low level of democratic culture and tradition, deficiency in citizen participation, lack of clear regulations, low level of institutional control, extreme poverty and inequality could be cited as major causes of corruption. Civil society is not even immune to the scourge. In addition, a blurred distinction between private and public interests, inadequate accounting and auditing, over regulated bureaucracy and deterioration of acceptable moral standards are all part of the problem.

Many African countries have adopted policy measures, enacted laws and established institutions in attempts to address the issue. Still corruption continues to be a lingering concern in governance and economic life. In this paper we attempt to explain determinants in the fight against corruption. Its contribution to the literature is threefold. (1) By focusing on the distribution of the dependent variable, we assess if corrupt and 'clean' countries respond differently to factors that deter corrupt activity. Unlike mainstream literature, we are able to

provide an assessment of CC conditional on the distribution of CC. (2) The use of much recent data(2002-2010) based on majority(46) of African countries provides results with inclusive and updated policy implications. (3) Disaggregation of the data-set into four homogenous panels, reflecting income-levels(low, middle, lower-middle and upper-middle) could provide more targeted policy implications.

Given both the herculean task of measuring the true level of corruption and the substantial effort required in creating another index(which could be no better than existing indices), two research avenues have been proposed(Billger & Goel, 2009). The first consists of examining additional determinants of corruption (Treisman, 2000) whereas the second entails employing different estimation techniques(McAdam & Rummel, 2004). The later strategy is the object of this paper. This approach allows us to capture the subtle differences in the determinants of CC across 'clean' and 'dirty' countries. Therefore an assessment throughout the conditional distribution of the fight against corruption could substantially add to the extant body of knowledge in the corruption development nexus.

3. Data and Methodology

3.1 Data

We examine a panel of 46 countries with updated data(2002-2010) from African Development Indicators(ADI) of the World Bank(WB). To allow for more options in policy implications, the data-set is disaggregated into income-levels(low, middle, lower-middle and upper-middle). The endogenous variable is the 'control of corruption' indicator; consistent with the corruption literature(Billger & Goel,2009; Okada & Samreth,2012; Asongu,2012). In this paper we use five control variables: level of economic prosperity, population growth, democracy, regulation quality and government effectiveness. These variables have been used collectively or

separately in the corruption literature(Bardhan,1997; Treisman,2000; Jain,2001; Aidt,2003; Lambdorff,2006; Billger & Goel,2009). A significant bulk of research has shown that a politico-economic approach stressing the importance of institutions is a powerful tool in understanding corruption(Abed & Gupta,2002; Bradhan,1997; Rose-Ackerman,1997). Electoral rules and structures substantially influence the corruption level(Kunicova & Rose-Ackeman,2005) and countries tend to achieve an equilibrium position that is driven by the balance of political forces and institutions(Bird et al.,2006; Bird et al.,2008). Beyond these empirical bases in the choice of government-quality control variables, the theoretical underpinnings of the corruption literature point to the central role of good-governance in the fight against the scourge. In plainer terms, selection of variables is fully justified by theoretical and empirical literature. Corresponding summary statistics(Appendix 1), correlation analysis(Appendix 2), variable definitions(Appendix 3) and presentation of countries(Appendix 4) are provided in the appendices.

Apart from good-governance determinants, borrowing from Billger & Goel (2009,p.300), economic prosperity and democracy are standard determinants of CC. Economic prosperity in the literature(Serra,2006) is observed to decrease corruption because from common-sense to some extent economic theory bribe-takers and bribe-givers are lower in wealthier nations, as the propensity to take bribe decreases when growth in national income is equitably distributed. Political competition entrenched in democracy is more likely to exert an appealing effect on the fight against corruption because elected officials are required to account for policies and are sanctioned by the electorate if election promises are not kept. A major election promise in majority of African countries is the fight against corruption. Government quality enshrined in regulation quality, government effectiveness, rule of law, voice & accountability and political stability(no violence) ensure greater economic and political freedoms

which lead to less corruption(Chowdhury, 2004; Goel & Nelson, 2005). The size of the population is also likely to affect corruption, especially if demographic change is accompanied with a higher degree of urbanization(Billger & Goel, 2009). A greater concentration of the population in urban areas is likely to increase their discount rates and provide greater opportunities for interactions between potential bribe-takers and bribe-givers. Conversely, a highly concentrated urban population could indicate a greater chance of informal corruption oversight (Billger & Goel, 2009).

3.2 Methodology

Borrowing from Billger & Goel (2009), to determine whether existing levels of CC affect how various determinants in the battle against corruption come into play, we use quantile regression. This approach enables us to investigate if the relationship between CC and the exogenous variables differ throughout the distribution of the dependent variable(Keonker & Hallock, 2001).

Previous studies on the determinants of corruption are based on estimation by Ordinary Least Squares(OLS), which report parameter estimates at the conditional mean of corruption. Whereas mean effects are certainly important, this study expands such findings using quantile regression. In addition, one of the underlying assumptions of OLS regression is that the error term and the dependent variable are normally distributed. However, quantile regression does not require a normally distributed disturbance term. Thus, based on this estimation technique we are able to carefully assess the determinants of CC throughout the conditional distribution with particular emphasis on the best and worst fighters of corruption. Quantile regression(hence QR) yields parameters estimated at multiple points in the conditional distribution of the dependent variable(Koenker & Bassett, 1978) and has been relevant in recent corruption literature(Billger

& Goel, 2009; Okada & Samreth, 2012). The θ th quantile estimator of the endogenous variable is obtained by solving for the following optimization problem.

$$\min_{\beta \in R^k}\left[\sum_{i \in \{i: y_i \geq x_i'\beta\}} \theta \left|y_i - x_i'\beta\right| + \sum_{i \in \{i: y_i \geq x_i'\beta\}} (1-\theta)\left|y_i - x_i'\beta\right|\right] \quad (1)$$

Where $\theta \in (0,1)$. Contrary to OLS that is based on minimizing the sum of squared residuals, with QR we minimize the weighted sum of absolute deviations. For example the 10th or 90th quantiles(with θ =0.10 or 0.90 respectively) by approximately weighing the residuals. The conditional quantile of y_i given x_i is :

$$Q_y(\theta / x_i) = x_i'\beta_\theta \quad (2)$$

where unique slope parameters are derived for each θ th quantile of interest. This formulation is analogous to $E(y/x) = x_i'\beta$ in the OLS slope though parameters are estimated only at the mean of the conditional distribution of the endogenous variable. For the model in Eq.(2) the dependent variable y_i is the CC indicator while x_i contains a constant term, GDP growth, population growth, democracy, regulation quality and government effectiveness. The quantile estimation approach is more robust than the OLS approach in the presence of outliers when the distribution of the dependent variable is a highly non-normal pattern(Okada & Samreth, 2012). We also report findings for Least Absolute Deviations(LAD) which should correspond to those of the 0.5th quantile for robustness purpose.

4. Empirical analysis

4.1 Low and Middle income countries

The findings presented in Table 2 entail OLS, LAD and QR estimates. While Panel A presents results for Low income countries, findings for Middle income countries captured by Panel B. OLS estimates provide a baseline of mean effects and we compare these to estimates of

LAD and separate quantiles in the conditional distributions of the endogenous variable. In interpreting the signs of estimated coefficients, note should be taken of the fact that smaller values(in conditional distributions) of the endogenous variable denote less CC.

The following could be established from the findings. (1) In Panel A, OLS regressions show that while economic prosperity mitigates the control of corruption, population growth and good-governance(regulation quality and government effectiveness) improve it. Corresponding Panel B OLS results differ from those of Panel A in one dimension: population growth decreases the fight against corruption. It follows that based on OLS, population growth is a tool for the fight against corruption only in Low income countries. (2) Based on QR, in both Low and Middle income countries, economic prosperity reduces incentives to CC with a higher magnitude at higher quantiles: countries that are already taking the corruption fight seriously. (3) As concerns QR estimates on population growth, while for Low income countries(hence LICs) the magnitude of the positive effect of population growth on CC increases in tandem with incentives to fight corruption, for Middle income countries(hence MICs), the negative effect of demographic change on CC has no definite pattern(wave-like effect across the distribution). (4) Whereas democracy diminishes CC in LICs(with the effect only significant at the 0.90^{th} quantile), the positive effect of democracy on CC in MICs is consistently significant across the conditional distribution(though the magnitude of the effect is wave-like). (5) Government effectiveness in either LICs or MICs improves CC with the magnitude increasing with the distribution: that is as the battle against corruption increases. (6) Regulation quality ameliorates CC in either LICs or MICs with a quasi-normal distribution with peaks at the 0.50^{th} and 0.25^{th} quantiles for LICs and MICs respectively. (7) The LAD findings correspond to the 0.50^{th} quantile estimates across specifications.

Table 2:Corruption-Control: Low and Middle income countries

Panel A: Low Income Countries(28)

	OLS	LAD	Q 0.1	Q 0.25	Q 0.50	Q 0.75	Q 0.90
Specification 1							
Constant	**-0.647*** **	-0.198	**-0.512*** **	**-0.351*** **	**-0.198***	**-0.438*** **	**-0.473*** **
	(0.000)	(0.281)	**(0.000)**	**(0.000)**	**(0.060)**	**(0.000)**	**(0.000)**
Economic Prosperity	**-0.007***	-0.004	-0.002	-0.003	-0.004	-0.006	-0.009
	(0.073)	(0.469)	(0.386)	(0.214)	(0.369)	(0.149)	(0.237)
Population growth	**0.100*** **	-0.048	**-0.091*** **	**-0.086*** **	-0.048	**0.094*** **	**0.253*** **
	(0.002)	(0.331)	**(0.000)**	**(0.000)**	(0.144)	**(0.006)**	**(0.000)**
Democracy	0.003	0.002	-0.0008	0.000	0.002	0.009	**-0.024** *
	(0.627)	(0.731)	(0.831)	(0.993)	(0.670)	(0.152)	**(0.033)**
Regulation Quality	**0.398*** **	**0.552*** **	**0.423*** **	**0.480*** **	**0.552*** **	**0.452*** **	**0.365*** **
	(0.000)	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**
Observations	252	252	252	252	252	252	252
Specification 2							
Constant	**-0.450*** **	**-0.286*** **	**-0.888*** **	**-0.567*** **	**-0.286*** **	**-0.293** *	**-0.348*** **
	(0.000)	**(0.009)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.013)**	**(0.000)**
Economic Prosperity	**-0.008** *	-0.007	-0.004	-0.004	**-0.007** *	-0.008	**-0.010*** **
	(0.026)	(0.125)	(0.534)	(0.338)	**(0.024)**	(0.102)	**(0.000)**
Population growth	**0.143*** **	**0.091** *	**0.095***	**0.072** *	**0.091*** **	**0.170*** **	**0.251*** **
	(0.000)	**(0.017)**	**(0.050)**	**(0.029)**	**(0.000)**	**(0.000)**	**(0.000)**
Democracy	-0.002	-0.002	0.007	0.001	-0.002	-0.003	**-0.009*** **
	(0.660)	(0.728)	(0.446)	(0.857)	(0.674)	(0.686)	**(0.000)**
Government Effectiveness	**0.685*** **	**0.731*** **	**0.513*** **	**0.613*** **	**0.731*** **	**0.737*** **	**0.699*** **
	(0.000)	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**
Observations	252	252	252	252	252	252	252

Panel B: Middle Income Countries(18)

	OLS	LAD	Q 0.1	Q 0.25	Q 0.50	Q 0.75	Q 0.90
Specification 1							
Constant	**0.213*** **	**0.165***	**-0.076*** **	**0.088** *	**0.165** *	**0.394*** **	**0.572*** **
	(0.001)	**(0.055)**	**(0.007)**	**(0.040)**	**(0.041)**	**(0.000)**	**(0.000)**
Economic Prosperity	-0.004	-0.005	0.001	-0.001	-0.005	**-0.009***	-0.002
	(0.355)	(0.262)	(0.529)	(0.645)	(0.299)	**(0.089)**	(0.539)
Population growth	**-0.251*** **	**-0.226*** **	**-0.225*** **	**-0.249*** **	**-0.226*** **	**-0.265*** **	**-0.294*** **
	(0.000)	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000°**
Democracy	**0.033*** **	**0.026*** **	**0.020*** **	**0.015*** **	**0.026*** **	**0.048*** **	**0.052*** **
	(0.000)	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**
Regulation Quality	**0.660*** **	**0.699*** **	**0.709*** **	**0.713*** **	**0.699*** **	**0.691*** **	**0.641*** **
	(0.000)	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**
Observations	162	162	162	162	162	162	162
Specification 2							
Constant	**0.126** *	**0.205*** **	-0.063	-0.038	**0.205*** **	**0.328*** **	**0.564*** **
	(0.027)	**(0.002)**	(0.178)	(0.507)	**(0.002)**	**(0.000)**	**(0.000)**
Economic Prosperity	**-0.008** *	**-0.007** *	-0.001	-0.004	**-0.007***	**-0.011*** **	**-0.011*** **
	(0.021)	**(0.040)**	(0.714)	(0.216)	**(0.082)**	**(0.033)**	**(0.000)**
Population growth	**-0.140*** **	**-0.209*** **	**-0.252*** **	**-0.166*** **	**-0.209*** **	**-0.149*** **	**-0.169*** **
	(0.000)	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.004)**	**(0.000)**
Democracy	**0.016*** **	0.009	**0.023*** **	**0.015*** **	0.009	**0.017** *	**0.010** *
	(0.005)	(0.220)	**(0.000)**	**(0.009)**	(0.149)	**(0.030)**	**(0.015)**
Government Effectiveness	**0.765*** **	**0.704*** **	**0.606*** **	**0.692*** **	**0.704*** **	**0.807*** **	**0.910*** **
	(0.000)	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**
Observations	162	162	162	162	162	162	162

Notes. Dependent variable is the Control of Corruption index. *,**,***, denote significance levels of 10%, 5% and 1% respectively. Lower quantiles (e.g., Q 0.1) signify nations where the Control of Corruption is least. OLS: Ordinary Least Squares. LAD: Least Absolute Deviation. LI: Low Income. MI: Middle Income.

4.2 Lower middle income and Upper middle income countries

Table 3 below presents results for Lower Middle Income(LMI) and Upper Middle Income(UMI) countries in OLS, LAD and QR estimates. Whereas Panel A presents results for LMI countries, Panel B depicts findings for their UMI counterparts. OLS estimates provide a baseline of mean effects and we compare the estimates of LAD and separate quantiles in the conditional distributions of the endogenous variable. In the comparative analysis smaller values(in conditional distributions) of the endogenous variable denote less CC.

The following could be established with respect to findings in Table 3. (1) For both Panel A and Panel B, OLS regressions show that while economic prosperity and population growth decrease CC, government quality dynamics (democracy, regulation quality and government effectiveness) improve it. (2) Based on QR in both LMI and UMI countries, economic prosperity reduces incentives to CC with a greater magnitude at higher quantiles: countries that are already taking the corruption fight seriously. (3) Population growth is detrimental to CC, however the pattern of the distribution is not definite(wave-like effect across the distribution). (4) Broadly, democracy ameliorates CC both in UMI and LMI countries with a greater magnitude at higher quantiles: countries with existing high CC levels. (5) Government effectiveness in either LMI or UMI countries improve CC with the magnitude increasing with the conditional distribution up to a certain level(0.50^{th} quantile for LMI countries and 0.75^{th} for UMI countries) before adopting a wave-like distribution(for LMI countries) or decreasing(for UMI countries). (6) The positive effect of regulation quality on CC is somewhat antagonistic: while for LMI countries it decreases to the 0.50^{th} quantile before increasing, for UMI countries it increases to the 0.25^{th} quantile before dropping progressively. (6)The LAD findings correspond to the 0.50^{th} quantile estimates across specifications.

Table 3: Corruption-Control: Lower middle and Upper middle income countries

	Lower Middle Income Countries(10)						
	OLS	**LAD**	**Q 0.1**	**Q 0.25**	**Q 0.50**	**Q 0.75**	**Q 0.90**
Specification 1							
Constant	**0.285*** **	**0.207** **	0.055	**0.098***	**0.207*** **	**0.407*** **	**0.621*** **
	(0.000)	**(0.049)**	(0.539)	**(0.053)**	**(0.007)**	**(0.000)**	**(0.000)**
Economic Prosperity	-0.006	-0.005	0.000	-0.003	-0.005	**-0.012***	**-0.014*** **
	(0.287)	(0.443)	(0.982)	(0.485)	(0.462)	**(0.063)**	**(0.000)**
Population growth	**-0.273*** **	**-0.265*** **	**-0.262*** **	**-0.244*** **	**-0.265*** **	**-0.274*** **	**-0.263*** **
	(0.000)	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**
Democracy	**0.036*** **	**0.032*** **	**0.023*** **	**0.023*** **	**0.032*** **	**0.047*** **	**0.045*** **
	(0.000)	**(0.000)**	**(0.006)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**
Regulation Quality	**0.706*** **	**0.645*** **	**0.750*** **	**0.705*** **	**0.645*** **	**0.694*** **	**0.781*** **
	(0.000)	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**
Observations	90	90	90	90	90	92	90
Specification 2							
Constant	**0.191*** **	**0.235*** **	0.105	**0.056*** **	**0.235*** **	**0.316** **	**0.403*** **
	(0.000)	**(0.000)**	(0.199)	**(0.000)**	**(0.000)**	**(0.012)**	**(0.000)**
Economic Prosperity	**-0.013** **	-0.011	-0.007	**-0.009*** **	**-0.011** **	-0.015	**-0.024*** **
	(0.011)	(0.133)	(0.365)	**(0.000)**	**(0.014)**	(0.198)	**(0.005)**
Population growth	**-0.221*** **	**-0.257*** **	**-0.334*** **	**-0.231*** **	**-0.257*** **	**-0.239*** **	**-0.182*** **
	(0.000)	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.003)**	**(0.002)**
Democracy	**0.022*** **	**0.017***	0.003	**0.009*** **	**0.017*** **	**0.024** **	**0.036*** **
	(0.000)	**(0.058)**	(0.694)	**(0.000)**	**(0.000)**	**(0.049)**	**(0.000)**
Government Effectiveness	**0.620*** **	**0.628*** **	**0.544*** **	**0.564*** **	**0.628*** **	**0.580*** **	**0.589*** **
	(0.000)	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**
Observations	90	90	90	90	90	90	90

	Upper Middle Income Countries(8)						
	OLS	**LAD**	**Q 0.1**	**Q 0.25**	**Q 0.50**	**Q 0.75**	**Q 0.90**
Specification 1							
Constant	-0.082	-0.301	**-0.227** **	-0.204	-0.301	**-0.211***	-0.156
	(0.930)	(0.468)	**(0.015)**	(0.207)	(0.456)	**(0.063)**	(0.725)
Economic Prosperity	-0.005	-0.011	0.0007	0.000	-0.011	**-0.022*** **	-0.000
	(0.452)	(0.399)	(0.759)	(0.989)	(0.268)	**(0.000)**	(0.944)
Population growth	-0.104	0.019	**-0.203*** **	**-0.168** **	0.019	-0.010	-0.063
	(0.349)	(0.924)	**(0.000)**	**(0.019)**	(0.914)	(0.823)	(0.743)
Democracy	**0.046***	0.048	**0.038*** **	**0.036** **	0.048	**0.091*** **	**0.126*** **
	(0.057)	(0.217)	**(0.000)**	**(0.019)**	(0.213)	**(0.000)**	**(0.003)**
Regulation Quality	**0.656*** **	**0.680*** **	**0.637*** **	**0.700*** **	**0.680*** **	**0.402*** **	**0.399** **
	(0.000)	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.045)**
Observations	72	72	72	72	72	72	72
Specification 2							
Constant	0.042	0.124	-0.122	-0.022	0.124	**0.204***	**0.333*** **
	(0.813)	(0.595)	(0.687)	(0.884)	(0.430)	**(0.096)**	**(0.000)**
Economic Prosperity	-0.006	-0.008	-0.0005	-0.005	**-0.008***	-0.004	**-0.008*** **
	(0.172)	(0.131)	(0.945)	(0.204)	**(0.052)**	(0.203)	**(0.000)**
Population growth	0.096	0.111	-0.177	0.013	0.111	**0.132** **	**0.080*** **
	(0.241)	(0.289)	(0.208)	(0.845)	(0.126)	**(0.021)**	**(0.004)**
Democracy	-0.032	**-0.055***	0.014	-0.025	**-0.055*** **	**-0.043*** **	**-0.030*** **
	(0.106)	**(0.084)**	(0.662)	(0.146)	**(0.001)**	**(0.001)**	**(0.000)**
Government Effectiveness	**1.159*** **	**1.232*** **	**0.720*** **	**1.026*** **	**1.232*** **	**1.279*** **	**1.210*** **
	(0.000)	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**
Observations	72	72	72	72	72	72	72

Notes. Dependent variable is the Control of Corruption index. *,**,***, denote significance levels of 10%, 5% and 1% respectively. Lower quantiles (e.g., Q 0.1) signify nations where the Control of Corruption is least. OLS: Ordinary Least Squares. LAD: Least Absolute Deviation. LMI: Lower Middle Income. UMI: Upper Middle Income.

4.3 Discussion, policy implications and limitations

4.3.1 What do wealth effects tell us?

Two important factors that will play in Africa's future are population growth and good-governance. Accelerating demographic change remains an important concern in Africa today with the continent's emergence as one with the highest demographic growth rate, with the population projected to double by 2036 and represent 20% of the World by 2050(Asongu & Jingwa, 2011). The recent geopolitical landscape of the African continent, marked by the Arab-Spring has centered around the perils of authoritarian regimes(Asongu, 2012). Thus population growth, democratization and the fight against corruption constitute serious challenges to the continent's ability to emerge from poverty.

Our investigation on the incidence of wealth-effects in the fight against corruption when existing corruption-control levels matter has yielded the following broad findings. (1) Based on OLS and QR estimates, population growth is a tool for the fight against corruption only in Low income countries with a higher magnitude at higher quantiles. This suggests that very poor countries experiencing faster population growth rates could use this instrument positively in improving good-governance. More so, LICs already taking the fight against corruption seriously will benefit more from this tool than their counterparts still lax in combating the scourge. (2) Population growth in MICs significantly mitigates the fight against corruption; this is consistent with UMI as well as LMI countries. This implies, in wealthier African countries population growth is accompanied with an increase in 'bribe-taker bribe-giver interactions' as well a decrease in corruption oversight. (3) Democracy decreases CC in LICs, with a significant effect at the highest quantile. In substance, it implies democratization in LICs doesn't come along with institutions that effectively combat corruption. This may in part be the result of

relative lack of financial means to set-up appropriate institutions. (4) Democratization is a tool in the fight against corruption only in MICs, with significant effects across specifications and distributions for the most part. This confirms the thesis that democracy requires a certain threshold in national economic prosperity for effectiveness.

4.3.2 Further discussion and limitations

The battle against corruption remains an important priority in policy making bodies in the African continent. Our findings suggest that OLS estimates correspond(stricto sensu) at times to just a specific quantile of the conditional distribution. This difference implies that some policies based on OLS should be reconsidered, especially across the best and worst fighters of corruption. Thus our findings demonstrate that blanket CC policies are unlikely to succeed equally across countries with different income-levels and political-wills in the fight against corruption. Success of CC policies should be contingent on the prevailing levels of CC and income-bracket as we have elucidated above. To be effective, CC initiatives should be tailored differently across the best and worst corruption-fighting countries especially with respect to democracy and population growth.

A great many African countries already have well established CC policies, yet their implementation and enforcement is another issue and remains a matter of 'political will'. The following are some aspects that need to be accounted for if reform and policies we have proposed are to yield fruits. (1) The battle against corruption cannot be a 'one man show' and relegated uniquely to political leadership. Anti-corruption endeavors are effective if they are inclusive, systematic and structured; that is to say integrating all institutions and policies(investigation, prosecution research and prevention). Such institutionalization develops a forum of mutually reinforcing 'horizontal accountability' which prevents reforms from being

perceived as partisan concerns or 'witch hunts'. (2) Administrations could establish public confidence through regular updates in press conferences that outline strides that are being made towards mitigating wrongdoing, increasing accountability and transparency. (3) The independence of the anti-corruption body set-up by the powers that be is also paramount for the success of reform strategies. In Hong-Kong and Singapore for instance, the effectiveness and success of anti-corruption establishments are directly linked to their degree of autonomy. If the independent entities are answerable to parliament instead of the head of state, this could improve their effectiveness.

An important limitation to take into account is that studies of this kind depend quite a lot on the integrity of the proxy for CC obtained from perception-based measures. Thus omitted variables and media-effect may significantly influence perceptions on the fight against corruption in a given country. However, as far as we know there are no better indicators of CC than those from African Development Indicators of the World Bank.

5.Conclusion

Why are some nations more effective at battling corruption than others? Are there different determinants in the fight against corruption across developing nations? How do wealth effects play-out when existing corruption-control levels matter in the corruption battle? To investigate these concerns we have examined the determinants of corruption-control throughout the conditional distribution of the fight against corruption. The following broad findings have been established. (1) Based on OLS and QR, population growth is a tool in the fight against corruption only in Low income countries with a higher magnitude at higher quantiles. (2) Population growth in Middle income countries significantly mitigates the fight against corruption; this is consistent with Upper as well as Lower middle income countries. (3)

Democracy decreases corruption-control in Low income countries, with a significant effect at the highest quantile. (4) Democratization is a tool in the fight against corruption only in Middle income countries, with significant effects across specifications and distributions for the most part.

As a policy implication, blanket corruption-control policies are unlikely to succeed equally across countries with different income-levels and political wills in the fight against corruption. Thus to be effective, corruption policies should be contingent on the prevailing levels of corruption-control and income-bracket as we have elucidated above. It follows that corruption-control initiatives should be tailored differently across the best and worst corruption-fighting countries especially with respect to democracy and population growth.

Appendices

Appendix 1: Summary Statistics

	Variables	Mean	S.D	Min.	Max.	Observations
Dependent Variable	Control of Corruption	-0.612	0.561	-1.694	1.086	414
	Economic Prosperity	4.602	5.254	-31.30	37.99	414
	Population Growth	2.262	0.815	-0.143	4.477	414
Independent Variables	Democracy	2.903	3.896	-8.000	10.000	414
	Regulation Quality	-0.651	0.617	-2.394	0.905	414
	Government Effectiveness	-0.703	0.603	-1.774	0.807	414

S.D: Standard Deviation. Min: Minimum. Max: Maximum.

Appendix 2: Correlation Analysis

CC	RQ	RL	GE	V& A	PolS	Demo	GDPg	Popg	
1.000	0.753	0.867	0.865	0.628	0.648	0.452	-0.043	-0.292	CC
	1.000	0.857	0.865	0.751	0.624	0.466	0.109	-0.224	RQ
		1.000	0.907	0.700	0.756	0.510	0.063	-0.282	RL
			1.000	0.699	0.644	0.483	0.036	-0.396	GE
				1.000	0.582	0.750	0.050	-0.100	V& A
					1.000	0.492	0.070	-0.194	PolS
						1.000	0.073	-0.094	Demo
							1.000	0.279	GDPg
								1.000	Popg

CC: Control of Corruption. RQ: Regulation Quality. RL: Rule of Law. GE:Government Effectiveness. V& A: Voice & Accountability. PolS: Political Stability. Demo: Democracy. GDPg: GDP Growth. Popg: Population Growth

Appendix 3: Variable Definitions

Variables	Signs	Variable Definitions	Source
Control of Corruption	CC	Control of Corruption(estimate)	World Bank(WDI)
Government Effectiveness	GE	Government Effectiveness(estimate)	World Bank(WDI)
Political Stability/ No Violence	PolS	Political Stability/ No Violence (estimate)	World Bank(WDI)
Regulation Quality	R.Q	Regulation Quality (estimate)	World Bank(WDI)
Rule of Law	R.L	Rule of Law(estimate)	World Bank(WDI)
Voice and Accountability	V & A	Voice and Accountability (estimate)	World Bank(WDI)
Economic Prosperity	GDPg	GDP growth rate(annual %)	World Bank(WDI)
Population growth	Popg	Average annual population growth rate	World Bank(WDI)
Democracy	Demo	Level of Institutionalized Democracy	World Bank(WDI)

WDI: World Bank Development Indicators.

Appendix 4: Presentation of Countries

Instruments	Instrument Category	Countries	Num.
Legal-origins	English Common-Law	Botswana, The Gambia, Ghana, Kenya, Lesotho, Liberia, Malawi, Mauritius, Namibia, Sierra Leone, South Africa, Sudan, Swaziland, Uganda, Zambia, Tanzania, Zimbabwe.	17
	French Civil-Law	Algeria, Angola, Benin, Burkina Faso, Burundi, Cameroon, Central African Republic, Chad, Congo Republic, Congo Democratic Republic, Djibouti, Egypt, Eritrea, Equatorial Guinea, Ivory Coast, Ethiopia, Gabon, Guinea, Guinea-Bissau, Libya, Madagascar, Mali, Mauritania, Morocco, Mozambique, Rwanda, Senegal, Togo, Tunisia.	29
Religions	Christianity	Angola, Benin ,Botswana, Burundi, Cameroon, Central African Republic, Congo Republic, Congo Democratic Republic, Ivory Coast, Equatorial Guinea, Ethiopia, Eritrea, Gabon, Ghana, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Rwanda, South Africa, Swaziland, Togo, Uganda, Zambia, Tanzania, Zimbabwe.	30
	Islam	Algeria, Burkina Faso, Chad, Djibouti, The Gambia, Egypt, Guinea-Bissau, Guinea, Libya, Mali, Mauritania, Morocco, Senegal, Sierra Leone, Sudan, Tunisia.	16
Income Levels	Low Income	Benin ,Burkina Faso, Burundi, Central African Republic, Chad, Congo Republic, Congo Democratic Republic, Djibouti, Ethiopia, Eritrea, The Gambia, Ghana, Guinea-Bissau, Guinea, Kenya, Liberia, Madagascar, Malawi, Mali, Mauritania, Mozambique, Rwanda, Sierra Leone, Togo, Uganda, Zambia, Tanzania, Zimbabwe.	28
	Middle Income	Algeria, Angola ,Botswana, Cameroon, Egypt, Ivory Coast, Equatorial Guinea, Gabon, Lesotho, Libya, Mauritius, Morocco, Namibia, Senegal, South Africa, Sudan, Swaziland, Tunisia.	18
	Lower Middle Income	Angola, Cameroon, Egypt, Ivory Coast, Lesotho, Morocco, Senegal, Sudan, Swaziland, Tunisia.	10
	Upper Middle Income	Algeria, Botswana, Equatorial Guinea, Gabon, Libya, Mauritius, Namibia, South Africa.	8

Num: number of countries

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