

ROLE OF CORRUPTION AND ITS IMPACT UNDER VARIOUS REGIMES: CROSS COUNTRY ANALYSIS

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ARTICLE INFO	ABSTRACT
<i>Article History:</i> Received: 12 Oct 2019 Revised: 02 Mar 2020 Accepted: 10 Jul 2020 Available Online: 10 Sep 2020 <i>Keywords:</i> Economic Growth, Corruption, Democracy, Autocracy, Anocracy. <i>JEL Classification:</i> D70, D73	Many empirical studies investigate relationship between democracy and corruption by considering democratic and non-democratic regimes. There are many economies which are not fully democratic and autocratic, so there is a dire need to explore these relationships in case of other two categories of political regimes, such as flawed democracies and hybrid regime. Does this relationship equally hold in these political regimes? This study gauges out the linkages between corruption and economic growth for all plausible cases of political regimes. Empirical analysis includes sample of 159 countries based on different political regimes, consisting on 20 full democracies, 55 flawed democracies, 39 hybrid regime, and 53 authoritarian regimes. The data are taken from the period of 2006 to 2019. The sophisticated empirical Bayesian estimation procedure is employed to explore the association between growth and socio-economic variables. The results indicate that corruption in case of mature democracies has no significant effect on economic growth While in autocracies has significant positive effect on economic growth. However, corruption has negative effect on economic growth in flawed democracies and hybrid regime.

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1. INTRODUCTION

How does corruption effect on economic growth? Theoretical literature provides no clear evidence on this issue. It is major concern for philosophers, policy makers, economists, political and social scientist since centuries. Corruption is mostly associated with bureaucracy, political leadership and dictators; its major consequences are tax evasion, poverty trap, economic devastation, harder to develop true democracy. The global cost of corruption is \$3.6 trillion which is approximately 5% of GDP of world economy (United Nation Report, 2019). Corruption has serious consequences on all fields of life, particularly it is considered strong constraint for economic growth and development process. Studies on economic growth and corruption, have long history, but fail to provide conclusive evidence of harmful effect both at macro and micro level. Although literature on corruption and economic growth growing rapidly, however, empirical evidence about this relationship still elusive. One stream believed corruption grease the seized wheel of economy; promote efficiency, reduce uncertainty, risk and official harassment, overcome red tape hurdles, delay and regulations, minimize the queuing cost and facilitates new firms to enter highly regulated environment (Leff, 1964; Huntington, 1968; Lui, 1985; Bardhan, 1997; Dong & Torgler 2013; Ondo, 2017). While second steam argued corruption divert resources to rent seeking activities rather than productive. It chocks development process, misallocate resources, promote poverty gap, increase transitional cost, effect FDI and finally corrode economic growth (Mauro, 1995; Tanzi & Davoodi, 1997; Mo, 2001; Dridi, 2013; Ghalwash, 2014; Thach et al., 2017). In contract third stream claimed 'non-linear' relationship exist economic growth and corruption (Ventelou, 2002; Menddez & Sepulveda, 2005; Adit et al., 2008; Meon & Weill, 2010).

Literature on democratization often simply segregate countries into two types, democracies and autocracies, but failing to account those economies that are undergoing transition from strong autocracy to full democracy. In following study, we try to cover this gap by proposing different perceptive to realize the consequence of corruption on economic growth by simultaneously investigative the linkage between corruption, growth and regime type. Following by Li and Wu (2010) we develop hypothesis that corruption will affect economic growth in different ways in these political regimes. Literature suggests mature democracies and autocracies are efficient in term of controlling corruption and tend to have higher growth rate, however, corruption put forth different effect in anocracies (flawed democracies and hybrid regime). As compare to anocracies, corruption in autocracies is less detrimental due to central control on bribing and public resources are efficiently allocate to bribes. Consequently, due to underdeveloped institutions and inefficient state machinery, growth seriously effect in anocracies than democracies and autocracies. To test these conjecture, we apply panel data of 159 countries, categorizing according to regime type for time period of 2006-2019 respectively. To assess the intermediating effect of political regime on corruption-growth association, we also add an interaction

term between regime and corruption. The rest of paper divided in following sections: section II about empirical model, data description and methodology and section III about empirical finding and discussion, section IV about conclusion and policy implementations.

2. EMPIRICAL MODEL, DATA DECEPTION AND METHODOLOGY

In following section, we will discuss empirical model, methodology and data description to investigate the relationship between economic growth, corruption and regime type.

2.1 Model

The standard growth model expresses the growth rate depends on various macroeconomics factors; such as investment, schooling and population growth rate etc. Are political and institutions factors also supplementary determinants of economic growth? To investigate this relationship, we develop growth model as an extension of Solow (1956) model by incorporating institutional factors such as democracy and corruption as additional explanatory variables. The basic model structured as:

$$\log R_GDP_t = \alpha_0 + \alpha_1 CORP_{it} + \alpha_2 REGM_{it} + \alpha_3 (CORP * REGM)_{it} + \alpha_4 POPL_{it} + \alpha_5 \log INI_GDP_{it} + \alpha_6 \log G_CONS_{it} + \alpha_7 \log LIFE_EXP_{it} + \alpha_8 \log EDUC_{it} + \alpha_9 \log T_OPNS_{it} + \varepsilon_{it} \quad (1)$$

Where R_GDP is real GDP indicates the growth rate, CORP represent corruption, REGM is level of democracy in four regimes, POPL is population growth rate, INI_GDP Initial GDP, G_CONS is government final consumption expenditure as % GDP, LIFE_EXP is life expectancy, EDUC represent primary school enrollment and T_OPNS is trade openness, lastly ε is error term and t is time and i show country. We draw data from WDI, Economic Intelligence Unit and Transparency International.

2.2 Data Description

We apply panel data of 159 countries, the data arranged as time series cross-sections for 2006-2019. We used real GDP as dependent variable, it indicate inflation adjusted measure that reflect the value of goods and services provide within one year. Unlike nominal GDP, real GDP present more accurate figure of economic growth. Our study involve various control variables. Theoretically, there are solid justification to believe that each has strong influence on growth performance. Empirically, these variables associate with economic growth in several cross-sectional studies and reasonably perform better in pooled data set (Barro 1997; Kurzman et al., 2002). Mainly, the inclusion of initial GDP per capita endorsed by neoclassical economists, suggesting diminishing returns to capital in advance. Barro, (1991) introduced this proxy for capital stock, later on this proxy become compulsory for empirical analysis for economic growth. We also used life expectancy another control variable. Policy makers argue that better health of worker enhance productivity process, since labore efficiently work, for maximum hours without debilitation or without succumbing to diseases. Typically quantity measure of health is average life expectancy. We also include government consumption, according to neoclassical economic theory, it is expected to have uncertain effect on growth rate. According to most of macro economists, that fiscal policy has positive effect on economic growth in short run while it become main reason of budget deficit and growth dampen in long run (Blanchard, 2009). But Mauro, (1995) justifies several reasons of positive effect of government expenditures on economic growth. Thirdly, we add population growth, refers the rate at which number of individuals increase in given time period, expressed as fraction of initial population. Population growth enhance economic growth, as when population increases, large number of skilled worker entered in labour force.

At certain level of investment, per worker capital stock and skilled labor enhancing economic growth. Fourth control variable is primary school enrollment which is proxied by human capital. Net enrollment rate is the ratio of children of official school age who are enrolled in school to the population of the corresponding official school age. Fifth control variable is trade openness, it is expected that it influence to growth positively. Empirical literature suggest that trade liberalization expedite growth process. It is common control variable and refer as ratio of GDP. Our main control variable is corruption. Its measurement is complex and disputed, however, we try draw data from most reliable source Transparency International, published Corruption Perception Index (CPI) since 1995. Other measures of corruption also available, but have serious limitations as compare to TI. It range from 0 to 10 where 0 show most corrupt and 10 least corrupt. For better interpretation, we recode the original data from 0 to 10 where 0 show no corruption and 10 show high corruption. Lastly, we include democracy as control variable, like corruption, measurement of democracy is also ambiguous due to the problem of conceptualization as well as accumulation. Hence, hardly single index provide the satisfactory measure and even the best indices also have many issues (Coppedge, 2002). We used democracy index compiled by EIU. This index published since 2006 and based on 60 indicators grouped in 5 categories (such as, political participation, political culture, government functioning, electoral pluralism

and civil liberties). The study includes countries as full democracies index (8.01-10), flawed democracies index range(6.01-8), hybrid regime (4.01-6) and authoritarian regime (0-4). The main variable of our study are corruption and regime type (democracy level). Therefore, we provide graphs with more information about these variables below.

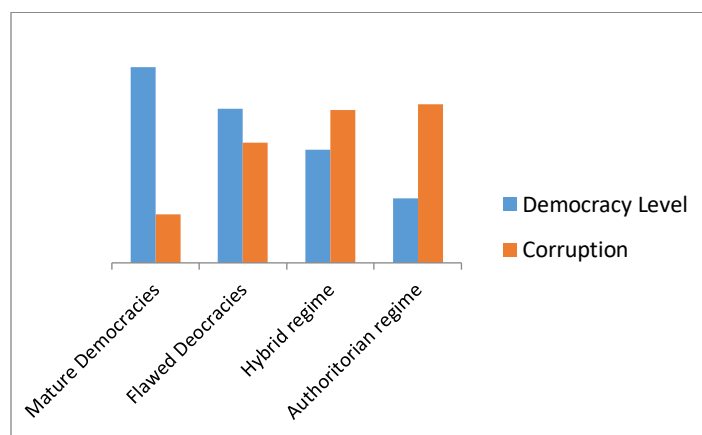


Fig. 1. Average Score of Democracy Index and Corruption Level in Different Political Regimes During (2006 -2019)

Sources: Author creation

3. METHODOLOGY

We used empirical bayesian estimator to explore the link between growth, corruption, democracy and several control variables. It is an alternative to classical techniques which are commonly used in estimation procedure. Empirical Bayesian Estimator consider better due to several advantages on classical approaches. The classical approaches in fact consider the pervious information regarding parameters and their dispersion. Specifically, Bayesian technique integrates the pervious information into model and improves the flexibility and power of model and helpful deliver better results. Generally the structures of economies are very country to country that is why the nature of series is also different. When we use common structure for different economies in panel modeling, it makes model quite restrictive, and also disregards the heterogeneous behavior among these economies. Different techniques try to cover this heterogeneity but these panel models are also having some econometric issues. The Random Effects panel model commonly face heteroscedasticity and autocorrelation problem, the Fixed Effects model face the loss of degree of freedom problem. Especially, when time effects on predicated coefficients also considered. Thus, to overcome panel model and Ordinary Least Square (OLS) model issues, we apply empirical Bayesian estimator for different regimes type analysis. Empirical Bayesian approach is preferable to others for small samples because it has quite a few notable advantages and gives more accurate and efficient outcomes.

4. EMPIRICAL FINDINGS AND DISCUSSION

Methodology comprises two main components; first part about descriptive statistics and second part about empirical Bayesian estimator. Before estimation procedure, we employ descriptive statistics and correlation matrix that present clear picture of data.

Table 1. Summary Statistics of Four Political Regimes

Regimes	Variable	Mean	Median	Maxi	Mini	Std. Dev.	Obs.
Full Democracies	lnR_GDP	11.673	11.674	13.314	9.937	0.775	220
	CORP	2.103	1.900	4.800	0.500	1.010	220
	DEMO	8.860	9.010	10.000	7.980	0.531	220
	POPL	0.943	0.828	2.971	-1.85	0.668	220
	ln_INI_GDP	4.539	4.670	5.049	3.529	0.398	220
	lnG-EXP	1.271	1.284	1.446	1.038	0.094	220
	lnLIFE-EXP	1.908	1.909	1.920	1.882	0.008	220
	lnEDUC	5.392	5.284	6.949	3.908	0.729	220
	lnT-OPEN	1.932	1.888	2.619	1.394	0.281	220
Flawed Democracies	lnR_GDP	10.959	10.840	12.808	9.102	0.803	598
	CORP	5.446	5.900	7.900	1.600	1.448	598
	DEMO	6.954	6.840	9.580	3.390	0.693	598
	POPL	0.769	0.831	3.040	-2.08	0.950	598
	ln_INI_GDP	3.923	3.946	4.690	2.985	0.440	598
	lnG-EXP	1.194	1.226	1.419	0.849	0.127	598
	lnLIFE-EXP	1.869	1.875	1.928	1.719	0.037	598
	lnEDUC	5.506	5.404	7.000	4.195	0.676	598
	lnT-OPEN	1.911	1.909	2.646	1.345	0.238	598
Hybrid Regime	lnR_GDP	10.361	10.394	11.906	7.859	0.726	311
	CORP	7.007	7.000	8.700	5.000	0.645	311
	DEMO	5.187	5.260	6.810	3.400	0.724	311
	POPL	1.940	2.045	7.061	-0.86	1.247	311
	lnINI_GDP	3.256	3.308	4.183	2.465	0.479	311
	lnG-EXP	1.155	1.153	1.949	0.702	0.193	311
	lnLIFE-EXP	1.830	1.844	1.901	1.658	0.051	311
	lnEDUC	5.652	5.751	6.955	4.523	0.587	311
	lnT-OPEN	1.814	1.812	2.493	1.403	0.169	311
Authoritarian Regime	lnR_GDP	10.622	10.585	13.100	8.834	0.924	363
	CORP	6.857	7.100	8.900	2.900	1.149	363
	DEMO	3.058	3.180	5.000	1.260	0.655	363
	POPL	2.301	2.381	14.237	-0.45	1.674	363
	lnINI_GDP	3.552	3.569	4.695	2.400	0.637	363
	lnG-EXP	1.132	1.120	1.737	0.311	0.192	363
	lnLIFE-EXP	1.822	1.829	1.906	1.679	0.055	363
	lnEDUC	5.460	5.472	7.675	3.916	0.733	363
	lnT-OPEN	1.790	1.804	2.323	-0.77	0.360	363

Table 2. Correlation Matrix of Political Regimes

		R_GDP	CORP	REGM	POPL	INI_GDP	G_CON	LIFE_EXP	EDUC	T-OPEN
Mature Democracies	R_GDP	1.000								
	CORP	0.124	1.000							
	REGM	-0.319	-0.7	1.000						
	POPL	-0.134	-0.081	0.267	1.000					
	INI_GDP	0.008	-0.394	0.492	0.326	1.000				
	G-CON	-0.219	-0.264	0.429	-0.168	0.025	1.000			
	L-EXP	-0.357	-0.058	0.372	0.345	0.249	0.18	1.000		
	EDUC	0.992	0.168	-0.351	-0.176	-0.002	-0.195	-0.353	1.000	
	T-OPEN	-0.308	0.217	-0.023	0.49	0.421	-0.149	0.229	-0.32	1.000
Flawed Democracies	R_GDP	1.000								
	CORP	-0.32	1.000							
	REGM	0.381	-0.596	1.000						
	POPL	-0.113	0.24	-0.353	1.000					
	INI_GDP	0.544	-0.778	0.658	-0.305	1.000				
	G_CON	0.179	-0.421	0.46	-0.367	0.489	1.000			
	LIFE_EXP	0.334	-0.538	0.545	-0.508	0.75	0.281	1.000		
	EDUC	0.564	0.12	0.101	0.133	-0.015	-0.212	-0.031	1.000	
	T-OPEN	-0.262	-0.412	-0.031	-0.184	0.263	0.006	0.207	-0.37	1.000
Hybrid Regime	R_GDP	1.000								
	CORP	-0.377	1.000							
	REGM	0.085	-0.128	1.000						
	POPL	-0.211	0.159	-0.164	1.000					
	INI_GDP	0.502	-0.015	-0.009	-0.258	1.000				
	G_CON	-0.067	-0.136	0.055	0.147	-0.099	1.000			
	LIFE_EXP	0.309	-0.098	0.184	-0.524	0.616	-0.131	1.000		
	EDUC	0.183	0.071	-0.054	-0.036	-0.077	0.002	0.029	1.000	
	T-OPEN	-0.025	-0.072	0.174	-0.157	-0.007	0.072	0.141	-0.30	1.000
Autocracies	R_GDP	1.000								
	CORP	-0.12	1.000							
	REGM	0.053	-0.143	1.000						
	POPL	-0.253	-0.203	-0.022	1.000					
	INI_GDP	-0.021	-0.716	0.115	0.454	1.000				
	GOVT	-0.009	-0.276	0.271	-0.124	0.204	1.000			
	LIFE_EXP	0.254	-0.682	0.115	-0.129	0.474	0.301	1.000		
	EDUC	0.981	-0.091	0.051	-0.253	-0.075	-0.049	0.238	1.000	
	T-OPEN	-0.179	-0.146	0.131	0.14	0.228	-0.033	0.162	-0.13	1.000

4.1 Results and Discussion

The empirical Bayesian has been employed to track the linkage between real GDP and other control variables. Our key concern is to investigate the regime type mitigate the destructive effect of corruption, however the role of other control variables also worth discussing. It is notable that previous cross-sectional studies of pooled data generally exclude many control variables that are not significant, hence we can't necessarily expect that all control variables significant. Indeed, it is interesting to test which variables are robust to time series cross-sectional analysis. At first in full democracies, estimated results in table 3 shows coefficient of corruption is negative but can't reach at signifies level, showing that there is not sufficient evidence that corruption dampen economic growth in full democracies. It strengthen our contentions that democracy level lessens the destructive effect of corruption. This finding supported by Brunetti et al. (1998), Mo (2001) Triesman (2007) and Haung (2016) who didn't confirm any significant relationship between economic growth and corruption. In contract, coefficient of regime has positive and significant effect on growth performance. It indicate that democracy level reduce the volatility and leads to higher growth rate in long term. Furthermore, degree of democracy also allow economy to face economic shocks and enhance the ability to adapt change in external environment. This result supports the extensive argument in existing democracy literature that democracy provides best opportunities for growth (Barro, 1991; Jalles, 2010). The coefficient of interaction term

also negative and significant illustrating the corruption and regime together have significant damaging effect on economic growth in full democracies. The coefficient of life expectancy also significant and positive. This finding strength the argument that life expectancy generally facilitates the growth performance. We also include initial GDP per capita, negative value indicate the speed of convergence that economy converges towards its steady state level, consequently effecting growth rate. The neoclassical growth theory also suggests that initial GDP has negative effect on economic growth indicating diminish returns to capital in advance economies

Table 3. Results of Full Democratic Regimes

Variable	Coefficient	Std. Error	t-Statistic
Constant	-47.26951	8.45983	-5.58753**
CORP	-0.81055	0.79372	-1.02121
REGM	0.02306	0.00826	2.79017**
CORP*REGM	0.05611	0.02262	2.48099**
POPL	0.33089	0.05774	5.73085**
<i>ln</i> INI_GDP	-0.11224	0.04529	2.47849**
<i>ln</i> G_CONS	0.54907	0.16559	3.31581**
<i>ln</i> LIFE_EXP	0.28025	0.06878	4.07447**
<i>ln</i> EDUC	0.08797	0.24312	0.36183
<i>ln</i> T_OPNS	0.69593	0.10732	6.48477**

Note: **, * indicates the significance level at 5% and 10% .

The coefficient of government expenditure is positive and significant indication public sector spending enhance economic growth as expected in full democracies. It reveals that government expenditure is much more contributing in in economic growth. Meanwhile, some studies suggest public spending hurt economic performance by shifting public resources from effective to less efficient sectors (Barro, 1991). The coefficient of school enrollment is positive but fail to approach significance level in full democracies. As expected, the coefficients of trade openness and life expectancy is positive and significant.

Table 4. Results of Flawed Democratic Regimes

Variable	Coefficient	Std. Error	t-Statistic
Constant	-31.8544	9.04899	-3.52022**
CORP	-1.91265	0.89841	-2.12892**
REGM	0.2546	0.03959	6.43017**
CORP*REGM	-0.1869	0.10496	-1.78074*
POPL	0.33342	0.06469	5.15420**
<i>ln</i> INI_GDP	0.09527	0.04944	1.92680*
<i>ln</i> G_CONS	0.44671	0.18374	2.43124**
<i>ln</i> LIFE_EXP	0.65399	2.199	0.2974
<i>ln</i> EDUC	0.21154	0.94823	0.22309
<i>ln</i> T_OPNS	0.34031	0.12225	2.78374**

Note: **, * indicates the significance level at 5% and 10% .

In contract in flawed democracies reported result in table 4 confirmed, corruption seriously effect economic growth. The estimated results show that 1 point increase in level of corruption reducing economic growth (-1.91) points in flawed democracies. Transitional economies usually experience high corruption because absence of institutional framework and effective administrative capacity which compulsory to deal with corruption. Furthermore, these illiberal democracies entails an elected political leadership where freedom and rule of law are secure in theories but violated in practice. In contract, the coefficient of regime is positive but coefficient of integration term is

negatively significant. Concerning coefficient of population growth also positive and significant in respective regime, this implies that increase in population growth enhance economic performance, because population growth is also used as proxy for labor growth. Labor is most dynamic and fundamental element of all economic activities such as social well-being and development (Barro, 1997). Expectedly, the coefficients of initial GDP, government consumption and trade openness is positive and significant but coefficients of life expectancy and education fail to approach conventional significance level.

Table 5. Results of Hybrid Regimes

Variable	Coefficient	Std. Error	t-Statistic
Constant	-50.16921	9.61533	-5.21763**
REGM	-0.15855	0.08042	-1.97167**
DEMO	0.61411	0.25027	2.45379**
CORP*REGM	-0.33158	0.11478	-2.88875**
POPL	0.36538	0.07057	5.17726**
INI_GDP	-0.06685	0.05293	-1.26287
G_CONS	-0.24821	0.10167	2.44126**
LIFE_EXP	0.38552	0.14003	2.75312**
EDUC	0.22725	0.05312	4.27815**
T_OPNS	0.5367	0.13709	3.91497**

Note: **, * indicates the significance level at 5% and 10% .

In hybrid regimes corruption also effect economic growth seriously, results reported in table 5. This regime is democratic in words but not in substance. Mainly, the reason of hyper corruption is absence of established democratic norms, political and institutional wiliness to caught and punish corrupt officials. Institution of accountability are limited in curbing corruption. Furthermore, transformation from autocracy to mature democracy is quite complicated. In reality, democratization is slow and steady process. The coefficient of regime is positive and significant but coefficient of interaction term is negative and significant illustrating the corruption and regime together have significant damaging effect on economic growth. Negative and significant effect of initial GDP indicates our results match with standard predication of growth theories. Coefficient of education also positive and significant. It justified as knowledge accumulation promote new ideas and improve the quality of products and encourage entrepreneurship, inventions which lead higher growth rate. These results validate not only traditional growth theories but also endogenous growth models which argue that accumulation of human capital is responsible for sustained growth rate (Mankiw et al., 1992; Dakhli & Clercq, 2004; Sadaf et al., 2020). The coefficient of trade openness also positive and significant.

Table 6. Results of Authoritarian Regimes

Variable	Coefficient	Std. Error	t-Statistic
Constant	-39.465	15.7801	-2.5009**
CORP	0.3483	0.1179	2.9552**
REGM	-0.2783	0.3721	-0.7478
CORP*REGM	-0.7014	0.1826	-3.8408**
POPL	0.5224	0.124	4.2135**
INI_GDP	0.0043	0.0736	0.0584
G_CONS	0.5294	0.2936	1.8033*
LIFE_EXP	0.55	0.1278	4.3047**
EDUC	0.0445	0.0012	37.6960**
T_OPNS	0.3827	0.2109	1.8147*

Note: **, * indicates the significance level at 5% and 10% .

Lastly, we reported result of autocratic regime in table 6. Expectedly, autocratic regime's result illustrate that coefficient of corruption is significant and positive which support the 'grease the wheel' hypothesis. It indicates if political leadership provides freedom to run business even at the cost of sharing rents that ultimately leads investment and economic growth. Bueno et al. (2001) also argued that dictators have no checks on their power and hence involve in corruption and cronyism. The coefficient of regime is negative and insignificant and inclined with (Drury et al., 2006) finding. The coefficient of initial GDP is insignificant in autocratic regime but government expenditure, life expectancy and education is positive and significant. Lastly, trade openness also have anticipated effect on economic growth. It implies that trade is engine of economic growth. Economists analogously suggests that trade liberalization enhance growth, providing comparative advantage and greater opportunity for learning of advance technology as well as allowing a better allocation of domestic resources (Lewis, 1980; Baghwati, 2005).

5. CONCLUSION

Several empirical studies analyzed the consequences of corruption on economic growth. In following paper, we investigate whether corruption-growth relationship is likely to be same in different political regimes. Our results confirmed that corruption didn't effect on economic growth in full democracies but during the transitional stage of political establishment, when a typical autocracy breakdown and convert in decentralized power structure (such as hybrid regime or flawed democracies), the level of corruption increased. Our analysis indicate that if we kept corruption at bay, flawed democracies and hybrid regimes may achieved higher economic growth. Corruption is harmful in all societies but it has serious consequence in transitional stage. In contract, corruption enhance economic growth in authoritarian regime. The argument is that corruption in autocracies is more efficient than dispersed or diffused corruption. Overall conclusion from this study is that institutions play vital role for economic growth and control corruption. This might be more closely linked to the economics based argument that corruption generally considered destructive for economic growth because it promote insecurity and thus transaction costs faced by firms and other state agents increased. Actually journey to democracy is uncomfortable and trajectory; economy may hurt from worsening corruption before enjoying the fruits of democracy. Policy makers and international agencies should suggest how transitional economies set democratization and same time how they can minimize the time period of anocracy. lastly, state agencies try to curb corruption and restructure their establishments to minimize complementarities that enhance corruption in these regimes.

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