The influence of Socioeconomic Factors on control of corruption in the Digital Era: Evidence from ASEAN Region

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Abstract

Corruption is a global problem and occurs in many places within the government. Socioeconomic factors such as human capital, government expenditure, and GDPC (Gross Domestic Product per Capita) are essentially social and economic development determinants. Lack of control of corruption (CoC) leads to high-income disparity, crime, chaos, national integrity, poor economic performance, and low living standards. On the contrary, the excellent control of corruption leads to improved income equality, social cohesion, macroeconomic performance, and a higher standard of living. This study assesses the role of Socioeconomic factors as a measurement for fighting against corruption in ASEAN (Association of Southeast Asian Nations) countries. This study reinforces the existing literature on the effect of Socioeconomic factors in promoting CoC. Using panel data of ASEAN countries over 33 years from 1984 to 2016, this study analyzed the data utilizing panel autoregressive distributed lags (ARDL). The finding of this study shows that the error correction is statistically significant. In the long run, the discovery under the PMG method indicates that socioeconomic such as GDPC is significant and has a negative impact on CoC. At the same time, Human Capital is significant and has a positive effect on CoC. On the other hand, government expenditure is significant and has a negative impact on CoC.

Keywords: Socioeconomic, human capital, GDPC, government expenditure, ASEAN, control of corruption

1. INTRODUCTION

The Association of Southeast Asian Nations (ASEAN) is a regional intergovernmental organization comprising ten Southeast Asian countries formed in 1967 (Secretariat, 2016). This integration's prime objective was to promote intergovernmental cooperation and facilitate economic, political, security, military, educational, and sociocultural integration among its members and other Asian states (Kivimäki,2001; Emmers,2003). The unique characteristics of ASEAN are diverse culture, rich natural resources, a high percentage of young population, an enormous market for foreign direct investment, and high usage of Information and Communication Technology (ICT), it leads to growth has to transform ASEAN into a leading economic region (Benny, 2016). The formation of this ASEAN aims, among others, to liberalize trade and investment, widen market opportunity, strengthen the competitive edge, enhance the exchange of skilled labour, and support the accomplishment of the sustainable development goals (SDG) (Secretariat, 2016; Soesastro, 2007). As a single market and production base, it is also envisioned that the ASEAN can become a highly competitive region, with equitable economic development, and fully integrated into the global economy (Soesastro, 2007; Secretariat, 2015).

The prospects for higher-level integration success are acceptable. The established ASEAN is also faced with disparaging issues such as ineffective governance, high-income disparity levels, and corruption (Mongid & Tahir, 2011). In the ASEAN context, governance constitutes processes underpinning traditions and institutions by which authority in a country is exercised. Due to its diverse culture, tradition, and religion, it is expected that the

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successful integration of governance will take a longer time than expected. Another common challenge faced by most ASEAN countries is poverty reduction. While a developed member nation such as Singapore boasts a high gross domestic product (GDP) per capita income of $51,000, a much "poorer" member like Cambodia is only tagging a low per capita income of $900 (Theworldbank, 2019). The Asia Global Institute, in its report in 2013, concluded that corruption is one of the most pressing issues confronting the ASEAN(Asiaglobalinstitute, 2016). In a simple layman's definition, corruption constitutes a form of dishonesty, abuse of power, or even criminal activity undertaken by a person, organization, or even a government who is entrusted with position or authority. The negative impact of corruption is its ability to negate any nation's economic and political stability. Accordingly, corruption must be fought at all costs if AEC's regional economic integration effectively. Therefore, all member nations must strategically and structurally establish anti-corruption programs.

Prior studies on corruption have mainly used the Corruption Perception Index (CPI) to measure the country's corruption (Habib & Zurawicki, 2002; Seligson, 2002; Davis & Ruhe, 2003). The perceived high level of corruption in the ASEAN is evidenced by the relatively weak corruption perception index (CPI) score within the last ten years (2007 – 2017). Figure1 summarizes the CPI Scores of ten ASEAN countries. Of the ten ASEAN member countries, only three nations, namely Singapore, Brunei, and Malaysia, have achieved an average score of more than fifty (50) CPI scores. The remaining seven countries are still struggling with issues of perceived corruption. In 2017 the CPI of two ASEAN countries, i.e., Cambodia and Lao PDR, was in the bottom twenty globally with scores less than 30 points.

Figure 1. CPI Scores of Ten AEC Countries
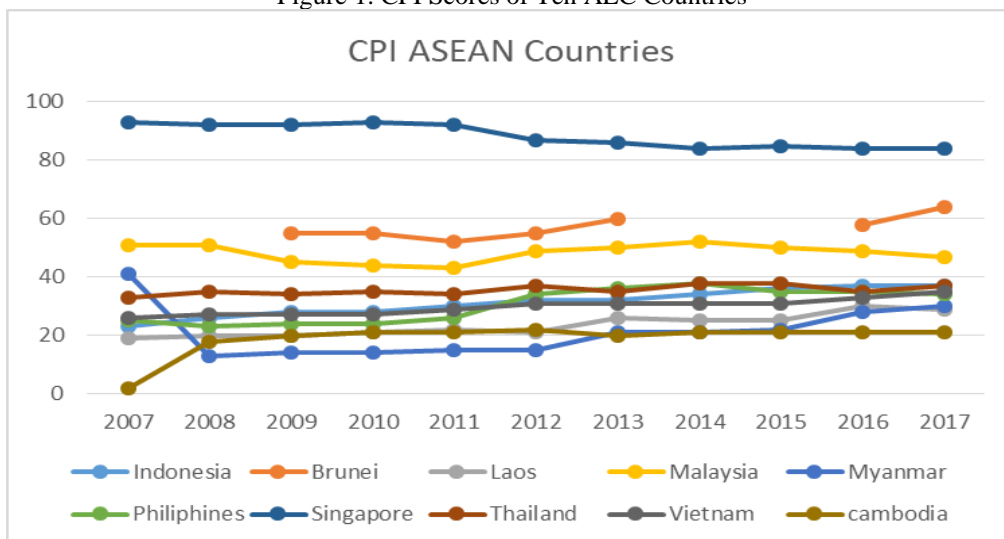
On the first note, this paper contributes to the existing literature by examining the socioeconomic role of CoC on ASEAN and understanding the encouraging and hindering factors that may influence the development and growth of the ASEAN region. The rest of the paper is organized as follows; Section 1 introduces the study. Section 2 is on the Methodology, while Section 3 is on the Conceptual Framework. In Section 4, the result is presented, and finally, Section 5 is about the conclusion.

1.1   Problem Statement, Research Objective, and Research Questions

According to North and Thomas (1973), the growth difference in cross countries is due to the discrepancy of institution or governance. The author also defined that "*Institutions are the rules of the game in a society or, more formally, are the humanly devised constraints that shape human interaction*" (North, 1990; p.10). Prior literature argued that is the Quality of Government (QoG) is an essential determinant for the economic and social development of a country (Busse and Gröning (2009) Kraay and Tawara (2010). Çule and Fulton (2013) state that high QoG significantly promotes the business environment. The economy focuses on the law's compliance, an adequate bureaucracy, and efficient control of corruption, eventually enhancing economic performance. Thus, QoG facilitates developing well-functioning property rights and the market's perfection that enhance accrue the best potential outcome from economic development factors. This notion of a strong linkage between various dimensions of country-level governance and economic performance is also supported by other relevant studies, e.g., Knack and Keefer, 1995; Mauro, 1995; Svensson, 1998; Acemoglu et al., 2001, 2002; Rodrik et al., 2002; Gradstein, 2008; Dollar and Kraay, 2003. Therefore, it is argued that ensuring an effective investor protection

system is one of the driving factors for economic performance. This is very apparent that many high-income countries, e.g., Sweden, Switzerland, New Zealand, Austria, Singapore, and so on, enjoy the sound QoG. In contrast, many developing countries like Indonesia, Myanmar, Afghanistan, and Lao PDR suffer from poor governance. Therefore, theoretical and anecdotal evidence endorses the importance of the QoG for economic development and a high standard of living.

Finally, the third category is the socioeconomics factor, which can determine the QoG. Socio-economic factors include education, poverty, investment, income, health, and expenditure. Socioeconomics is an endeavour to reform economics, most notably to replace the homo oeconomicus paradigm from the dominant position in economics at least into the 1980s (Stern, 1993; Dimension, 1988; Coughlin, 1999). However, Mauro (1995) found that corruption decreases investment, and as a result, it decreases the rate of growth. It also reduces expenditure on education (Mauro, 1998). According to (Tanzi 1998), corruption can improve poverty by decreasing poor people's potential income. Tanzi (1998) found that corruption brought society and changed the government's role by stopping enforcing contracts and protecting property rights. Tanzi (1998) also found that corruption improves government running and reduces government income. Prior research investigated the link between CoC's socioeconomic factors (Maeda & Ziegfeld, 2015; Brown & Shackman, 2007). They stated that developing countries with less-educated People tend to have a higher level of corruption than rich countries with well-educated people. Also, Economic growth increases corruption in the short run but reduces corruption in the long run. Research by Mauro (1995), Tanzi and Davoodi (1998); Johnston (1998); Gupta et al. (2002), and Uslaner (2008) found that corruption harms society by inequalities in income and social status. Previous studies related to socioeconomic factors tend to focus on government (Cardoso, 1980; Hill, 1994; Uzochukwu & Onwujekwe, 2004). Whereas, the role of socioeconomic factors to improve QoG and control of corruption on country level is hardly researched.

In summary, the digital era has a specific role in influencing corruption in the light of asymmetric information theory. Likewise, socioeconomic factors can determine the CoC. To the best of researchers' knowledge, no study focuses on scrutinizing the role of socio-economic factors on CoC, especially in ASEAN countries context. Accordingly, the following research objectives and research questions are covered.

This study aims to examine the influence of socio-economic factors on CoC in ASEAN countries. As the main objective of this study. While the specific aim of this study is:

1. To examine the relationship between socioeconomic factors and control of corruption.
2. To examine the relationship between the Human Capital factor and control of corruption
3. To examine the relationship between the Government Expenditure factor and control of corruption
4. To examine the relationship between GDPC factor and control of corruption

As mentioned in the research background, socioeconomic factors are related to CoC. Based on the discussion of the literature review, the following research questions were achieved in this study:

1. Is there any relationship between Socioeconomic factors and CoC?
2. Is there any relationship between Human Capital and CoC?
3. Is there any relationship between Government Expenditure and CoC?
4. Is there any relationship between GDPC and CoC?

2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Corruption is a well-known problem in public and private governments (Heidenheimer et al., 1970; Chowdhury et al., 2018; Miller, 2016; Banerjee et al., 2012). Corruption refers to "behaviour which deviates from the normal duties of a public role because of private-regarding (family, close private clique) pecuniary or status gains; or violates rules against the exercise of certain types of private-regarding Influences" (Nye,1967 p.4). Nye (1967) classified fraud into the behaviour as bribery (use of reward to pervert the judgment of the person in a position of trust); nepotism (bestowal of patronage because of ascriptive relation rather than merit); and misappropriation (illegal appropriation of public resources for private-regarding used).

Many factors contribute to corruption. Kaufmann et al. (2011); and Tanzi and Davoodi (1998) argue that some corruption sources are public works, state procurement, and privatization. If those activities do not provide transparency, it will build corruption, primarily if the organization or institution does not provide the necessary safeguards against corruption (Kaufmann, 1998; Tanzi, 1998). Also, the tax system and the auditing of organization tax services in a country are sources of corruption. Other corruption factors are historical factors,

geographic influences, and the government's size and scope (Goel & Nelson, 2010). Another source of corruption in developing countries indicates higher corruption, according to (Treisman 2000), the GDP per capita, which explains the corruption index. The CoC is another variable examined in this study. The CoC measures how public and private power are exercised for private gain. Tarnoff (2009) stated that the CoC measure includes petty and grand corruption in the public and private sectors. The CoC also measures the strength and effectiveness of the policy of the nations and institutional framework to mitigate corruption.

The definition of socioeconomics is a social science, which measures how economic activity affects and is formed by the social process (Baker, 2014). According to Business Dictionary (2018), socioeconomic is a "field of study that examines social and economic factors to understand better how the combination of both influences something." Socioeconomics links to education, finance, economic growth, GDP growth, population, health, and other social issues.

Some prior research argues that "corruption disproportionately harms the socioeconomically disadvantaged, as it exacerbates existing inequalities (Mauro, 1995; Tanzi & Davoodi, 1998; Johnston, 1998; Gupta et al., 2002; Uslaner, 2008). Furthermore, developing countries with less-educated people tend to have a higher level of corruption than rich countries with well-educated people (Maeda & Ziegfeld, 2015). Also, prior research confirms that corruption is negatively related to economic growth (Mauro, 1995). However, economic growth, democratic accountability, and the rule of law all impact corruption but not the other way around (Brown & Shackman, 2007). According to Brown and Shackman (2007), Economic growth increases corruption in the short run but reduces corruption in the long run. Maeda and Ziegfeld (2015) found that a lack of education and money countries observe enormous corruption than rich countries with educated people. Thus, this phenomenon only happens in developed countries. Generally, the statistical relationship is low in developing countries and sometimes vice versa. It means developed countries "those who are most harmed by corruption, the socioeconomically disadvantaged, will tend to perceived higher levels of corruption" (Maeda & Ziegfeld, 2015). As for that, the following hypotheses are developed:

H1: **There is a relationship between the Socio-economic Index and control of corruption**
H1a: **There is a relationship between Human Capital and the control of corruption**
H1b: **There is a relationship between Government Expenditure and control of corruption**
H1c: **There is a relationship between GDPC and control of corruption**

3. CONCEPTUAL FRAMEWORK

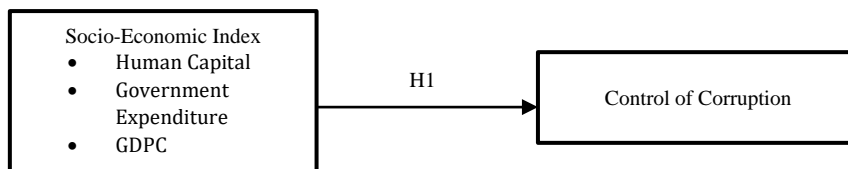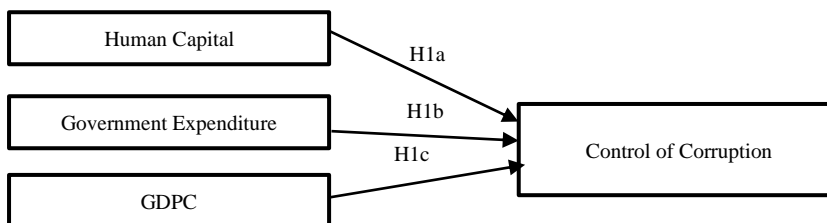Figure 2. Model 1. Socioeconomic Index on CoC

Figure 3. Model 1. Socioeconomic Indicators on CoC

About the above theory, the following empirical framework is developed:

$$CoC_{it} = HC + Gove + GDPC \ldots\ldots\ldots\ldots(1)$$
$$CoC_{it} = \beta_0 + Glob_{it} + gove_{it} + gdpc_{it} + hc_{it} + \varepsilon_{it} \ldots\ldots\ldots\ldots(2)$$

In equation 1, CoC denotes the socioeconomic index over time and across countries, β_0 indicates intercept, $GlOB_{it,}$ reflects Globalization over time and across countries, and finally, ε_{it} Indicates error terms or explained

observations. In equation 2, CoC denote the dimension of Socioeconomic include HC (Human Capital), GOVE (Government Expenditure) and GDPC (Gross Domestic Product per Capita), and finally, ε_{it} Indicates error terms or explained observations.

4. METHODOLOGY

This study intends to conduct on ASEAN countries. Eight countries will be selected as a study scope for this study's purpose, including Malaysia, Indonesia, Brunei Darussalam, Singapore, Thailand, Vietnam, Cambodia, and the Philippines. Some reasons why ASEAN, as the sample of this research, have to grapple with poverty reduction issues. High poverty may cause by the low level of quality governance. As a result, it leads to high corruption. Hence, the poor scores for 8 out of 10 ASEAN countries implicate the need to address ways to reduce income inequality and the need for ASEAN to develop strategies to build a good governance level. This research will analyze the impact of ICT development on governance and corruption by using 8 ASEAN countries in 1984 – 2016.

As indicated earlier, this study will adopt the macroeconomic approach using a publicly available panel and time-series data from reputable agencies. Quality of Governance (QoG) measurement will be sourced from ICRG (International Country Risk Guide) of the Quality of Government Institute, Gothenburg University, Sweden. Data on Control of Corruption (CoC) will be taken from the WGI (Worldwide Governance Indicators). Meanwhile, data on ICT Development, Globalization, Socioeconomic factors are obtained from World Development Indicators (WDI) of the World Bank.

This research applies a panel autoregressive distributive lag model (ARDL) analysis. This method applies because of the flexibility of the assumption of this study and the nature of the small data size. For example, in the data's existence of a unit-root problem, panel static methods such as fixed effect, random effect, pooled OLS are unsuitable. Furthermore, a dynamic method such as GMM is criticized when assessing long panel time-series data. However, a panel dynamic method like ARDL (p,q) has exciting structures. The ARDL method is suitable for long panel time-series data and mixed order of integration of either I(1) or 0(1). There are three types of panel ARDL models: the mean group (MG), the pooled mean group (PMG), and the dynamic fixed effect (DFE). All types of ARDL run under maximum likelihood estimations (MLE).

The first-panel ARDL called MG prediction was introduced by Pesaran and Smith (1995). This prototype estimated the long-run parameters by taking an average of the long-run co-efficient of each cross-section. This prototype predicts different regressions for each country. It then examines the parameters with unweighting means of the individual countries' prediction coefficients without restriction. Therefore, the MG method allows coefficients to be heterogeneous in the long and short runs.

The second method is the PMG estimator developed by Pesaran et al. (1999). It shows the autoregressive distributed lag (ARDL) version of the error correction framework with the co-integration test adjustment. This method allows short-run coefficients, heterogeneous long-run adjustment to the equilibrium, and homogeneous long-term coefficients across countries. In contrast, we test the validity, consistency, and efficiency to check the PMG method's robustness. The estimated parameter of the long-run error correction term should be negative. The error-correction term residual should be negative. The residual of the error-correction PMG method should be serially uncorrelated. However, these conditions can be fulfilled by including the ARDL (p,q) lags for the dependent (p) and independent variables (q).

The third method is the DFE estimator. This method has some similar structures to the PMG method in terms of the co-integrating factors' coefficient to be homogenous across all panels in the long run. However, unlike the PMG estimator, the method of DFE also restricts the speed of adjustment coefficient and the short-run coefficient to be homogenous. Furthermore, this prediction provides panel-specific intercepts. It permits for intragroup correlation in measuring standard error with a cluster option. However, according to Kao and Chiang (2000), an estimator of DFE suffers from simultaneous equation bias endogeneity between the error term and the lagged dependent variable. Finally, under the assumption of long-run slope homogeneity, PMG's estimator appreciates efficiency over DFE and MG prediction Pesaran et al. (1999). The selected ASEAN region follows a homogeneous nature; therefore, PMG would be the appropriate estimation.

5.   RESULTS AND DISCUSSION

5.1   Unit Root Analysis

The unit root test is executed to examine a series of interests to conclude the integration's separate order. It is also necessary to note that no variable over integration order I(1) to avoid false results Pesaran and Pesaran (1997). Furthermore, it is essential to check the variables to choose a suitable econometric model. The result of panel unit-root tests is presented in Table 1. Im et al. (2003) in Table 1 clearly shows that the test accepts the null hypothesis of unit-root presence in the respective variables. As a result, this study's variables are stationary at the first difference level, which authenticates the ARDL (p,q) approach to analyze data. The result from the dynamic analysis using panel ARDL (p,q) framework is presented in Table 2. The ARDL method clarifies the authenticity of the relationship between Socioeconomic and CoC in selected ASEAN countries. We reflect on the three methods of the ARDL framework: PMG, MG, and DFE. The coefficient on the error-correction term is required to be negative and not less than -2.

Table 1. Panel Unit-root Analysis

Variables	Level	1st difference
	IPS	IPS
CoC	-1.8175	-4.4060
SEC	NA	NA
Gove	-2.4212	-6.7721
LGDPC	0.1068	-3.9105
HC	-1.7096	-2.5844

5.2   Socioeconomic Index on CoC

Table 22 shows that this coefficient's error correction is -0.537*** and statistically significant at the 1% level. In the long run, the finding under the PMG method indicates that socioeconomics has a positive and significant impact on CoC.

Table 2. Socioeconomic index on CoC

Variables	PMG Long Run	PMG Short Run	MG Long Run	MG Short Run	DFE Long Run	DFE Short Run
Error Correction		-0.537***		-0.669***		-0.461***
		(0.0904)		(0.0800)		(0.145)
Socioeconomic Index		-2.924		-3.156		-0.532
		(2.706)		(2.883)		(0.373)
Socioeconomic Index	-0.231**		-2.317		-0.817	
	(0.116)		(1.971)		(0.538)	
Constant		-0.154		3.595		0.413
		(0.450)		(3.612)		(0.410)
Observations	58	58	58	58	58	58

10%*, 5%** and 1%***

5.3   Socioeconomic Indicators on CoC

Table 3 shows the error correction that this coefficient is -0.429*** and statistically significant at the 1% level. In the long run, the finding under the PMG method indicates that Socioeconomic such as Gross Domestic Product per Capita statistically significant at the 1% level, Human Capital statistically significant at the 1% level, and Government expenditure statistically significant at the 5% level has a positive and significant impact on CoC.

Table 3. Socioeconomic indicators on CoC

Variables	PMG Long Run	PMG Short Run	MG Long Run	MG Short Run	DFE Long Run	DFE Short Run
Error Correction		-0.429*		-1.026***		-0.769***
		(0.257)		(0.226)		(0.173)
GPDPC		0.143		0.410		-1.002
		(1.611)		(2.787)		(2.299)
Human Capital		-0.219		-5.142		1.230
		(34.12)		(19.84)		(2.358)
Gov Expenditure		-0.0472		-0.0504		-0.0247
		(0.0440)		(0.0474)		(0.0240)
GPDPC	-7.782***		-2.250		-3.414**	-7.782***
	(1.938)		(1.438)		(1.368)	(1.938)
Human Capital	3.577***		4.837		1.654*	3.577***
	(1.106)		(3.267)		(0.963)	(1.106)

Gov Expenditure	-0.0320**		0.00181	-0.0487***	-0.0320**
	(0.0131)		(0.00634)	(0.0177)	(0.0131)
Constant		30.03		4.449	23.51**
		(18.64)		(10.77)	(9.357)
Observations	58	58	58	58	58	58

10%*, 5%** and 1%***

This funding support previous research. Brown and Shackman (2007) stated that economic growth (GDPC), government expenditure, democratic accountability, and the rule of law all impact corruption but not the other way around. According to (Brown & Shackman, 2007), Economic growth increases corruption in the short run but reduces corruption in the long run. Maeda and Ziegfeld (2015) found that a lack of education and money tends to observe enormous corruption than wealthy and educated people. Thus, this phenomenon only happens in a developed country in ASEAN case seven nations are still developing countries, only Singapore and Brunei are developed countries and Malaysia middle income country. The developing countries, the statistical relationship is low and sometimes runs vice versa. It means developed countries "those who are most harmed by corruption, the socioeconomically disadvantaged, will tend to perceived higher levels of corruption" (Maeda & Ziegfeld, 2015).

Specifically, the result showed that the Socioeconomic index negatively correlates with CoC. It means the ASEAN country's socioeconomic has a negative and significant relationship impact CoC. The monotonic relationship between socioeconomic and CoC are not moving in the same direction. In terms of GDPC, the result shows that GDPC has a negative and significant correlation with CoC. On the other hand, the result shows that Human Capital has a positive and significant relationship with CoC. It means the better human capital in a country, the better the control of corruption. Finally, the result shows that Government Expenditure has a negative and significant relationship with CoC.

6. CONCLUSION

This paper has examined how socioeconomic factors influence the control of Corruption in the ASEAN region. By using three types of panel ARDL framework: MG, PMG, and DFE, the finding shows that the Socioeconomic index has a negative and significant on the Control of Corruption in the long run. This paper contributes to the theory and practice of macroeconomy by highlighting how Socio-Economic factors impact the Control of Corruption. The authors recognize the limitations of the present study and suggest that these limitations can be viewed as opportunities for future work and reflections. First, this research only measures the ASEAN region and limited independent variables. Future studies should attempt to replicate this research in different settings and regions. The empirical findings in this research are influenced by the ASEAN region, particularly the Control of Corruption initiatives.

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