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# Corruption, Shadow Economy and Economic Growth: Evidence from Emerging and Developing Asian Economies

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### ABSTRACT

This paper investigates the interactions of corruption and the shadow economy with economic growth in 17 selected Asian countries with emerging and developing economies. These countries are categorized according to International Monetary Fund sources and chosen based on available data. This paper analyzes the annual data over the period 2000 – 2015 from the World Bank, Transparency International and from International Monetary Fund to estimate whether corruption and shadow economy affect economic growth. Generalized Methods of Moments (GMM) method is used in this research. The results show that corruption index has a statistically significant and positive impact on economic growth while the shadow economy has a significant negative impact. These findings suggest that corruption does not sand but "greases on the wheel" of economic growth. Further, a reduction in the size of shadow economy could be more *beneficial for* emerging markets and developing economies in Asia to develop economy. Additionally, the results also indicate that in these countries, foreign direct investment, public expenditure, tax revenue and inflation have a positive impact on the growth while remittances have no relationship. Hence the findings from this research propose that economic growth would be significantly affected by policies on controlling corruption. These findings also provide political implications for the regulation of corruption and the shadow economy.

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## INTRODUCTION

Determinants of economic growth have become increasingly attractive to economists and policymakers over recent decades. A number of studies on this research topic have been conducted based on a range of data, scope and characteristics. Studies into economic growth carried out in emerging and developing economies, however, have been absent and not much attention has been paid to the impact of a merger between corruption and shadow economy. Described as two catastrophic activities, corruption and shadow economy coexist, diminish democratic governance and the rule of law, and have a negative impact on economic growth. Transparency International (2016) defines corruption as the misuse of power in order to have personal ad-

vantages, which is the focus of most literature on corruption. Corruption is considered damaging emerging economies and a barrier to economic growth in general. According to the literature on economics, this negative impact on economic growth is explored via a number of transmission channels. Particularly, it is proved that corruption is negatively correlated with trade and economic growth due to its influence on the physical capital accumulation (Sahakyan & Stiegert, 2012). Nonetheless, from other researchers' points of view, it is impossible to always blame corruption on its damaging effects because it can also provide benefits for the growth. According to Haque & Kneller (2015), corruption is positively related to economic growth as it simplifies administrative procedures and promotes transparency of the juridical system.

There has been a debate over the influence of shadow economy on economic growth. On the negative side, the shadow economy could make government expenditure decline owing to a decrease in tax collected from this sector. This could also make other taxpayers lose motivation for performing their duties. Consequently, economic growth might fall due to the development of this informal sector. In addition, the shadow economy is found to have a relationship with low levels of productivity and slow economic growth. As an illustration of this, Kirchler (2007) pointed out that although only taking a modest share in high-income countries, shadow economy amounts to 70% of share in low-income countries in Africa. It appears that both corruption and the shadow economy evade regulations and taxations. Hence this leads to a reduction in tax revenues, a rise in public expenditures and a decrease in productivity and economic growth. On the positive side, owing to this informal sector, the competitiveness and effectiveness in the formal sector might be stronger and this would make the economy develop at a faster pace. For example, companies in formal sector could make use of cheap services or avoid strict regulations (Schneider & Enste, 2000). In addition, budgetary policy on expenditure provides a positive stimulus to both of these sectors when the informal sector is positively correlated with the formal sector. In fact, in a country these two parts of the economy interact with each other so closely that it is impossible to break off the relationship between them. As a consequence, the existence of a continuous interaction between the informal sector and the formal sector is undeniable. Schneider (2005) and Schneider et al. (2010) indicate that the formal sector cannot perform its work effectively if there is no interaction with the informal one. Schneider (2005) also points out that the shadow economy definitely has an impact on the growth of the formal economy at a certain level.

Accordingly, currently there has been a dispute over ethical and economic implications between the contrary effects of both shadow economy and corruption, especially in emerging and developing economies in which these effects have not been considered studying. Based on formal analysis, this research will give more details of these effects on these economies and contribute to the literature in this area. This research also examines the impacts of the shadow economy and corruption on economic growth in emerging markets and developing in Asian economies which are considered having different features compared to advanced economies. In this research, we propose a version of economic growth which is an endogenous growth model. From this model, decisive factors are taken into account to predict the effects on economic growth. In other words, via this model it is possible to investigate how the key factors comprising corruption and shadow economy impact growth and whether there are any differences in the results from previous studies in advanced economies. Further, other factors such as foreign direct investment, remittances, public expenditure, tax revenue and inflation are also examined. Hence the research is expected to contribute empirical evidence of the contrary influence of corruption and shadow economy on economic growth to this area by employing GMM.

This research is presented as follows: the next section is literature review. Section 3 describes methodology and data, followed by the section of results and discussion. The final section presents policy implications and suggestions for further studies.

## **1. LITERATURE REVIEW**

### **1.1 Corruption and economic growth**

Corruption is considered playing a destructive role in economic growth and it is proved that there is a correlation between a high level of corruption and countries with low income. Corruption is found to be one of the most major barriers against economic growth, development of society, and poverty alleviation. From the 2000s onwards, a lot of empirical research has applied Transparency International's Corruption Perception Index (CPI) to explore decisive factors of corruption and its economic and political results (d'Agostino et al., 2016a; Gründler & Potrafke 2019; Huang, 2016; Vasylieva et al., 2018). Recent research conducted by

d'Agostino et al., 2016a; 2016b indicates that there is a direct negative correlation between corruption and economic growth. More specifically, it is suggested that corruption slows economic growth down by increasing military spending (d'Agostino et al., 2016a). Corruption is also found to contribute to a fall in economic growth in the case of low investment rates (Cieřlik & Goczek, 2018a). This correlation has been investigated in various parts of the world. d'Agostino et al. (2016b) find that there is a negative relationship between corruption and economic growth in Africa. Similarly, Tsanana et al. (2016) also prove that corruption has a negative relationship with economic growth in EU countries. In addition, it is proposed that corruption negatively affects economic growth and becomes a barrier against increasing investment (Gundlach & Paldam, 2009), absorbs European funds (Achim & Borlea, 2015), reduces efficiency in financial policy (Kaufmann et al., 2010; Iwanyna et al., 2015), and eventually slows economic growth. Specifically, Kaufmann et al. (2010) state that corruption has an intense relationship with fiscal deficits in developed countries. Moreover, corruption also causes tax revenues to reduce, public expenditures to rise, and has an impact on productivity, competition and development. Similarly, according to Iwanyna et al. (2015), corruption is negatively correlated with government revenues and becomes a barrier to economic development.

Nonetheless, a different aspect of literacy confirms opposing results. An empirical research into the relationship between Chinese continual high GDP growth and the generality of government corruption shows that in countries with bad governance such as China corruption can encourage allocation of resources and improve productivity (Jiang & Nie 2014). Likewise, Huang (2016) points out that this relationship is positive in South Korea. Accordingly, literature review shows views of both negative and positive effects of corruption on the growth in the context of different economies.

## 1.2 Shadow economy and economic growth

Compared to corruption, shadow economy is considered a more complicated phenomenon. This underground economy is involved in illegal activities comprised of producing illegally-branded goods; doing illegal drug trade; trading off; having business compulsion; being involved in commercial prostitution; giving loan sharking; gambling illegally; employing workers illegally; hiding income; and evading tax (Schneider et al., 2015). To make shadow activities the most distinctly familiar, Schneider et al. (2015) found out that shadow economy consists of all of the market-based legal manufacturing and services which are intentionally hidden for many reasons: (1) to evade tax payments such as income tax, value added tax, etc; (2) to evade responsibility for social security contributions; (3) to evade legal requirements of labor market in relation to wages, working hours, safety requirements, etc; and (4) to evade requirements of administrative process such as filling in administrative forms. Accordingly, shadow economy is comprised of two major components. The first one refers to undeclared work that a wide area of shadow economy carries out. In other words, employers avoid declaring their workers' wages to evade taxes and legal requirements of labor market. The second one refers to underreported income to reduce taxes.

Moreover, Kirchler (2007) found that there is a correlation between the highest ratio between underground activities and less developed countries and those in transition. As an illustration of this, Kirchler (2007) indicated that 41% of economic activities are done secretly in Africa and South America. Likewise, it is predicted that tax fraud in developed countries accounts for 20% of the total income and this figure is even higher in less developed countries (Orviska & Hudson, 2003). Furthermore, it has been claimed that a drop in the shadow sector results in a rise in tax revenues. Consequently, public goods are manufactured with larger quantity and higher quality. This in turn stimulates economic growth. However, when public goods are produced in massive quantities, there is plenty of competition for public services between the formal sector and the informal one which does not depend on these services. Hence this can make economic growth slowdown because of ineffective allocation of the use of public goods. Schneider and Hametner (2014) indicate this negative correlation between the shadow economy and economic growth in Columbia.

However, Williams (2006) proves that there is a positive correlation between the shadow economy and economic growth when competition is reduced and shadow entrepreneurs are given ways to avoid strict government regulations designed to control the informal sector. This self-selection process can eventually raise economic growth. Moreover, the shadow economy uses extra demand and supply provided by the formal economy. As an illustration of this, according to Asea (1996), in the short term in the course of economic recession, the shadow economy offers less expensive products and services by recruiting jobless people. In the long term, the shadow economy has capability to take over organizations in charge of factor accumulation. Hence Schneider & Enste (2000) point out that economic growth is not clearly affected by the shadow econ-

omy. In agreement with this view, Zaman & Goschin (2015) emphasized that shadow economy, particularly in emerging economies, is a major shield against a number of issues when only a few beneficiaries pay voluntary and various contributions. These issues include high unemployment level, money laundering, and effective use of public merchandise on domestic market on the basis of market principles. Overall, it would be possible to summarize that shadow economy and corruption are more likely to exist in less developed countries. Accordingly, there are mixed results of the effects of shadow economy on economic growth and this depends on the context of the research area such as developed economies or less developed economies.

## 2. DATA AND METHODOLOGY

### 1.1 Research objective

The research focuses on examining the effects of the shadow economy and corruption on economic growth of 17 selected emerging and developing Asian countries over the period 2000 – 2015. Particularly, how the key factors comprising corruption and the shadow economy impact growth and whether there are any differences in the results from previous studies in advanced economies. Further, other factors such as foreign direct investment, remittances, public expenditure, tax revenue and inflation are also examined.

### 1.2 Data descriptive statistics

This research uses annual data from 17 selected emerging and developing Asian countries during the period 2000 to 2015. Based on the categorization of the International Monetary Fund, a sample considered a representative panel of a regional group is analyzed. The countries, which are studied in this research according to the availability of data, are provided in the appendix. Other countries are not selected due to a shortage of data. Primary data were collected from the World Bank (2016) - World Development Indicators and data about shadow economy (SE) and corruption perception index (CPI) were collected from the sources by estimating Medina & Schneider (2018) and Transparency International (2016) respectively. Dependent variable and explanatory variables are calculated by these datasets. The research focuses on the impact of key factors including corruption and shadow economy on economic growth. Particularly, Gross Domestic Product per capita collected from World Bank (2016) is a dependent variable which represents economic growth. Besides, a group of control variables comprising foreign direct investment (FDI), remittances (RE), public expenditure (PE), tax revenue (TR) and inflation (IF) are also examined in the empirical model. Figures 1 and 2 draw the relation between the GDP per capita in 17 selected countries against the corruption perception indices and the shadow economy level. These figures illustrate the relation between the variables and an empirical estimation should be done to explore the relation among these variables comprising corruption, shadow economy and GDP.

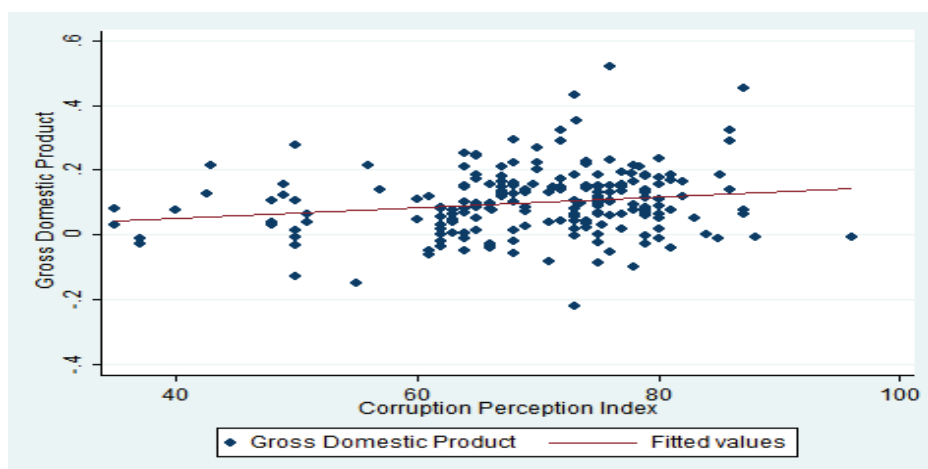


Figure 1. GDP against corruption index

Source: Authors calculated from research data

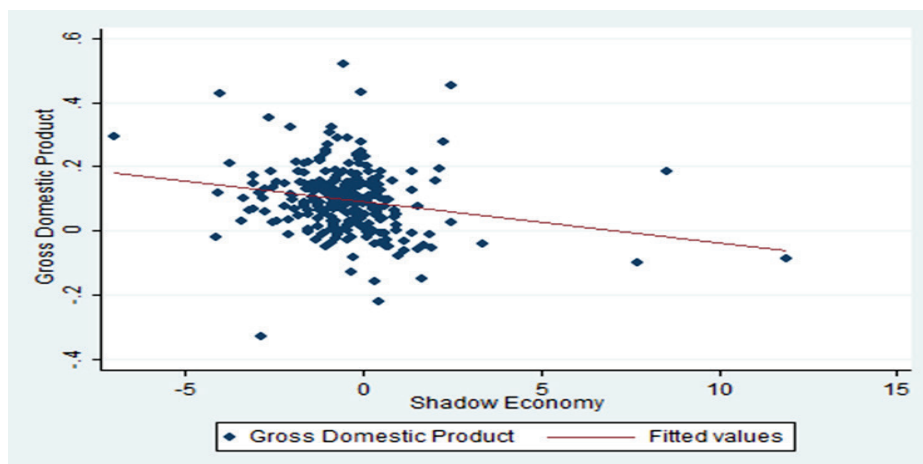


Figure 2. GDP against shadow economy level.

Source: Authors calculated from research data

Table 1 provides a short description of the mean value of indicators for the sample of 17 Asian countries in the emerging markets and developing economies underinvestigated in this research. The mean value of economic growth is measured by real GDP per capita of about 2,224 US\$ where the real GDP per capita is measured in a range from minimum value at 137.17 to maximum value at 11,319.08 US\$. The data on Corruption Perceptions Index collected from Transparency International (2016) ranges from 0 (totally corrupt) to 100 (not corrupt). In order to provide a clear explanation of empirical findings, the estimation of corruption has been rescaled so that 0 stands for not corrupt and 100 stands for totally corrupt. The mean value of corruption indicator is 69.68 and it is by far higher compared to the mean value of 50 in a range of 0-100, so this number denotes high level of corruption in these countries. The selected emerging markets and developing countries in Asia have the mean value of shadow economy measured by % GDP stood at 30.72%. The detailed description of the shadow economy and other indicators are also presented in the table 1 below.

**Table 1.** Data descriptive statistics and data sources

<i>Variable</i>	<i>Obs.</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Min</i>	<i>Max</i>	<i>Source</i>
Gross domestic product per capita (GDP- US\$)	272	2,223.78	2,268.61	137.17	11,319.08	World Bank (2016)
Corruption Perception Index (CPI - ranges from 0 (highly corrupt) to 100 (very clean))	215	69.68	10.63	35.01	96.01	Transparency International (2016)
Shadow Economy (SE-%GDP)	272	30.72	10.84	11.74	54.17	Medina, L., Schneider, F. (2018)
Foreign Direct Investment (FDI-constant 1 bil US\$)	270	12.841	42.938	-4.550	290.928	World Bank (2016)
Remittances (RE - constant 1 bil US\$)	266	7.521	14.777	0.001	70.389	World Bank (2016)
Public Expenditure (PE - constant 1 bil US\$)	235	65.334	206.390	0.964	1,546.149	World Bank (2016)
Tax Revenue (TR - %GDP)	206	11.83	3.84	2.00	28.71	World Bank (2016)
Inflation (IF - %GDP)	271	6.31	6.43	-18.11	57.07	World Bank (2016)

Source: Authors calculated from research data

Table 2 illustrates the nexus of corruption, the shadow economy, macroeconomic variables and economic growth. Generally, it is clear that economic growth has a positive correlation with corruption. Besides, foreign

direct investment, remittances, public expenditure, tax revenues and inflation exert positive influences on economic growth while the shadow economy has adverse effects on this growth.

**Table 2.** Correlation matrix

	<i>GDP</i>	<i>CPI</i>	<i>SE</i>	<i>FDI</i>	<i>RE</i>	<i>TR</i>	<i>IF</i>
<i>GDP</i>	1						
<i>CPI</i>	0.1122	1					
<i>SE</i>	-0.3293	0.0131	1				
<i>FDI</i>	0.1101	0.0448	-0.0119	1			
<i>RE</i>	0.0019	0.4347	-0.0105	0.6431	1		
<i>PE</i>	0.6147	0.1386	0.1392	0.0555	-0.0192	1	
<i>TR</i>	0.1156	0.0188	-0.0731	-0.0861	0.0152	0.1495	1
<i>IF</i>	0.2144	0.2169	-0.0199	-0.2970	-0.126	0.1528	-0.1013

Source: Authors calculated from research data

## 2.3 Empirical analysis

In order to investigate the effects of corruption and shadow economy on economic growth, this research employs different alternative methods for estimating the empirical model which comprises OLS method, fixed effects method and Generalized Methods of Moments (GMM). Firstly, OLS method is estimated for preliminary estimation. A Hausman test is then carried out and it denoted that fixed effects estimation was steadier than random effects estimator. A static model is constructed as follows:

$$\text{Economic growth}_{it} = \alpha_0 + \beta_1 \text{CPI}_{it} + \beta_2 \text{SE}_{it} + \beta_3 \text{FDI}_{it} + \beta_4 \text{RE}_{it} + \beta_5 \text{PE}_{it} + \beta_6 \text{TR}_{it} + \beta_7 \text{IF}_{it} + \mu_i + \epsilon_{it} \quad (1)$$

Here,  $i, t$  refers to the country  $i$  at year  $t$ . Economic growth is a dependent variable, which is measured by the log of a real per capital GDP (GDP); explanatory variables include Corruption Perception Index (CPI); Shadow economy (SE); the log of foreign direct investment (FDI); the log of remittances (RE); the log of public expenditure (PE); Tax revenue (TR) and the log of inflation (IF);  $\mu_i$  symbolizes unobservable firm-specific and time-invariant effects;  $\epsilon_{i,t}$  is an idiosyncratic disturbance term.

The static model has a limitation which does not capture the process of adaptation in economic growth during the period. In order to resolve this restriction, the economic growth in previous year is considered because it could impact the growth in the current year. Accordingly, a lagged dependent variable is added to this empirical research as an explanatory variable by employing GMM estimator method. Hence a dynamic model is performed as follows:

$$\text{Economic growth}_{it} = \alpha_0 + \alpha_1 \text{GDP}_{i,t-1} + \beta_1 \text{CPI}_{it} + \beta_2 \text{SE}_{it} + \beta_3 \text{FDI}_{it} + \beta_4 \text{RE}_{it} + \beta_5 \text{PE}_{it} + \beta_6 \text{TR}_{it} + \beta_7 \text{IF}_{it} + \epsilon_{it} \quad (2)$$

In which,  $\text{GDP}_{i,t-1}$  refers to the lagged economic growth $_{it}$ .

## 3. RESULTS AND DISCUSSION

Table 3 reports the regression result using three different estimation methods for economic growth in emerging and developing Asian countries over the period 2000 - 2015. The research investigates the effects of variables on economic growth such as corruption perception index (CPI), shadow economy (SE), foreign direct investment (FDI), remittances (RE), public expenditure (PE), tax revenue (TR) and inflation (IF). The prior estimation employs OLS method. The results in column (1) indicates that most variables in the model are statistical significant and have an effect on economic growth, except corruption perception index (CPI), remittances (RE), tax revenue (TR). Specifically, foreign direct investment (FDI), public expenditure (PE) and inflation (IF) have a positive impact on economic growth, while the shadow economy (SE) has a negative influence on economic growth. However, if there is a correlation between the measurement error and the unobserved

explanatory variable, the results from OLS estimator will be biased. To overcome this issue IV estimation is considered to be employed.

Columns (2) and (3) in table 3 show different results by estimating fixed effects and GMM methods. In the OLS model, there is no statistically significant relationship between corruption perception index (CPI) and economic growth. However, there is a statistically significant relationship between these variables in the fixed effects and dynamic model which is estimated by GMM method in column (2) and (3) respectively. The results, which demonstrate a similar outcome to fixed effects estimators and GMM methods, show that corruption index has a statistically significant and positive effect on economic growth. This result is not in line with previous studies which denote that corruption interferes in economic growth (Tanzi & Davoodi 2007). Additionally, as reported by Pellegrini and Reyer (2004), the finding also suggests that corruption is one of the reasons which slows growth and impedes investment in developing economies. Similarly, according to Meon and Sekkat (2005), corruption has a negative impact on economic growth and this influence is not related to investment and has a propensity to impair the quality of governance. Nonetheless, corruption is found to encourage economic growth in newly industrialized Asian economies (Jiang & Nie 2014; Huang 2016) The finding from this research is therefore consistent with other research in the present time (d'Agostino et al. 2016a; 2016b). These authors reveal that corruption could also stimulate corrupt officials to make allocation of government resources inefficient since they try to fulfill their potential for rent-extraction.

**Table 3.** The estimation results

<i>Dependent variable: Economic growth</i>			
	OLS	Fixed effects	GMM
	(1)	(2)	(3)
<b><math>GDP_{t-1}</math></b>			-0.199** (0.078)
CPI	0.0003 (0.0005)	0.006*** (0.002)	0.009*** (0.002)
SE	-0.028*** (0.008)	-0.028*** (0.004)	-0.024*** (0.004)
FDI	0.007** (0.003)	0.015** (0.007)	0.023** (0.009)
RE	-0.004 (0.004)	-0.005 (0.014)	-0.009 (0.029)
PE	0.503*** (0.105)	0.451*** (0.048)	0.458*** (0.076)
TR	0.002 (0.006)	0.002 (0.005)	0.015* (0.008)
IF	0.021*** (0.007)	0.022** (0.011)	0.036* (0.019)
Number of observations	142	142	115
<b><math>R^2</math></b>	0.58	0.623	
Arellano–Bond Test for 2nd order (P-value)			0.106
Sargan Test (P-value)			0.169

Note: \*, \*\* and \*\*\* denote 10%, 5% and 1% levels of significance, respectively. Standard errors are presented in the parentheses. Source: Authors' estimation.

The finding in this research supports the view that corruption plays an important role as “grease on the wheel” in economic growth particularly in a bureaucracy structure. It can be explained that the appearance of corruption in the economy will decline the bureaucratic red tape which is advantageous for the development of economic (Wedeman, 1997). Furthermore, Lau, Demir, and Bilgin (2013) also conclude that by expanding bribery, corruption could diminish the uncertainty of policies which are issued by government to become more foreseeable. In general, corruption is considered “speed money” which is used to limit the time consuming in bureaucratic procedures. This not only boosts profitable trades but also increases the foreign direct investment inflow (Egger & Winner, 2005). Accordingly, this increases the effectiveness of an economy by removing obstacles to investment and growth.



Besides, the results in column (3) clearly show that the shadow economy (SE) again has an expected negative sign with economic growth and is statistically significant at level of 1%. It is logical that the adverse influences of the shadow economy are presented by the decline of the tax base, and then the revenues of government will be reduced. In consequence, this leads to the limitation of the goods and services which are supplied by public areas. Hence an expansion in the size of shadow economy would establish a negative correlation with public finance and investment. In the long term, the shadow economy impacts the economy growth (Schneider et al., 2010). Moreover, researchers (Schneider et al., 2000) support the view that the presence of shadow economy leads to biased calculation in the public reports. Based on this untrue statistics, government might face with mistakes in issuing inadequate macro policies which create detrimental influences on economic growth. In addition, the shadow economy absorbs the labor workforce and investment capital from the official economy. However, these agents are not allowed to approach the preference resources compared to others which are operating in the formal economy. Gradually, these agents would act ineffectively and not build the value added for the general economy.

This finding reinforces most previous works asserting that shadow economy has a negative impact on economic growth (Schneider & Hametner 2014). Likewise, it is supposed that the *shadow economy* is negatively correlated with official economy in transition countries (Eilat & Zinnes 2002) due to the decrease in tax revenues and the inefficiency of government policies on redistribution. Additionally, foreign direct investment (FDI), public expenditure (PR), tax revenue (TR) and inflation (IF) are positively significant with economic growth while remittances (RE) are not statistically significant. As discussed in the literature review section, the shadow economy is one of the reasons not only diminishing direct tax collections and indirect government spending but also considerably reducing the motivation of companies for paying tax. Consequently, expanding the shadow economy could negatively affect economic growth. However, the empirical findings suggest that when the shadow sector goes into recession, it could raise tax revenues and government may increase their public expenditure. Hence both the quantity and quality of public goods, which stimulate the economic growth, are improved as a result of an increase in tax revenues.

## CONCLUSION

This research investigated how corruption and the shadow economy affect economic growth of emerging markets and developing countries in Asia during the period 2000-2015 by using some control factors such as foreign direct investment, remittances, public expenditure, tax revenue and inflation. The empirical findings indicate that corruption positively affects economic growth. This confirms the view that corruption does not sand but greases the wheels of economic growth. In addition, these findings also support that corruption is found to encourage economic growth in emerging and developing Asian countries and reduce barriers to economic growth. However, the shadow economy has negative effects on the growth. This means an increase in the size of shadow economy could negatively impact the economic growth of emerging markets and developing countries in Asia. The findings also suggest that a reduction in the size of shadow economy could be more beneficial for emerging markets and developing economies in Asia.

The research findings primarily provide political implications for those who have to adopt necessary incentives and policies to regulate corruption and decrease the size of shadow economy. While corruption and shadow economy have been found not to assist with economic issues in most advanced economies, this research shows empirical evidence that corruption definitely has positive impact on economic growth in the context of emerging and developing Asian countries.

Future research on this area can be conducted to examine the nexus between shadow economy and official economy or investigate one-way or multiple-way effect on the linkages amongst the size of shadow economy, institutional quality and growth.

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## APPENDIX

Countries are investigated in the research: *Bangladesh, Bhutan, Cambodia, China, India, Indonesia, Lao P.D.R., Malaysia, Maldives, Mongolia, Myanmar, Nepal, Papua New Guinea, Philippines, Sri Lanka, Thailand, and Vietnam.*