International Journal of Business and Society, Vol. 23 No. 3, 2022, 1360-1377

CORRUPTION AND ENTREPRENEURSHIP IN DEVELOPING COUNTRIES

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ABSTRACT

The importance of entrepreneurship as a driver of economic development cannot be denied. Nevertheless, developing countries suffer from unsatisfactory entrepreneurship level, partially explained the low economic growth. Given the main attribute of developing countries, which is highly corrupted, this study empirically investigates the effect of corruption on entrepreneurship in 48 developing countries from 2008-2016. By using Generalized Method of Moments (GMM) estimator, the results show that an increase in corruption will promote more new business start-ups suggesting that in highly corrupted countries, potential entrepreneurs may observe that the only way to start a business is to bribe government officers to get licenses, permits and business approval. Therefore, a proactive role of government in effectively reducing and eventually eliminating corruption to create a more conducive environment for entrepreneurs to grow up is very critical.

***Keywords*:** Entrepreneurship; corruption; developing countries; GMM

Received: 10 May 2020
Accepted: 21 September 2022
https://doi.org/10.33736/ijbs.5168.2022

1. INTRODUCTION

Policymakers, scholars, and economists firmly believe that economic growth for both developed and developing countries can be improved by entrepreneurship activities (Koellinger & Thurik, 2012; Stuetzer et al., 2018). Entrepreneurship significantly contributes to a country's development in terms of providing employment opportunities and offering product varieties. Apart from creating new and more jobs, entrepreneurship also promotes social welfare through income distribution, encourage competition, and promote technological change due to globalization, which signals increased productivity and economic stimulate (Chowdhury et al., 2015; Aparicio et al., 2016; Guerrero et al., 2017). The nature of entrepreneurship in developing countries is a bit different

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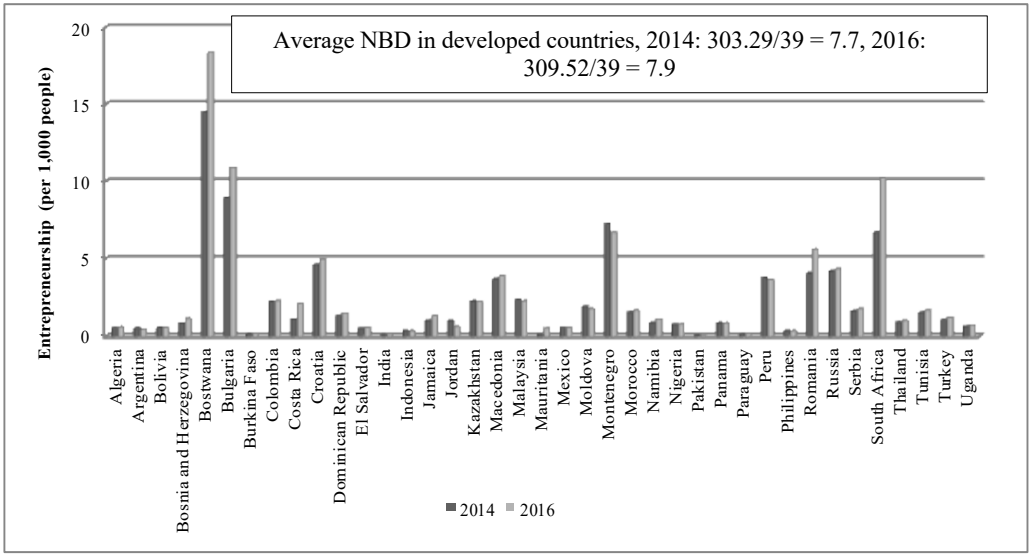
from developed countries. Given the lack of uniqueness or less technology-oriented, apart from sensitive to new entrance, entrepreneurs in developing countries are also susceptible to sudden changes in the cost of production, particularly those due to corruption. Figure 1 shows a snapshot of entrepreneurship level in the selected developing countries. The entrepreneurship level is illustrated by the new business density in 2014 and 2016. On the positive note, good progress of entrepreneurship in most developing countries can generally be observed, whereby many countries are able to register improvement in terms of the number of new business registration in 2016, as opposed to 2014. For instance, countries such as Botswana, Bulgaria and South Africa have recorded a significant improvement in 2016 as compared to 2014, accompanied by other developing countries such as Croatia, Macedonia, Romania, and Russia, which recorded a slight upward trend.

Figure 1: Entrepreneurship in the Selected Developing Countries.



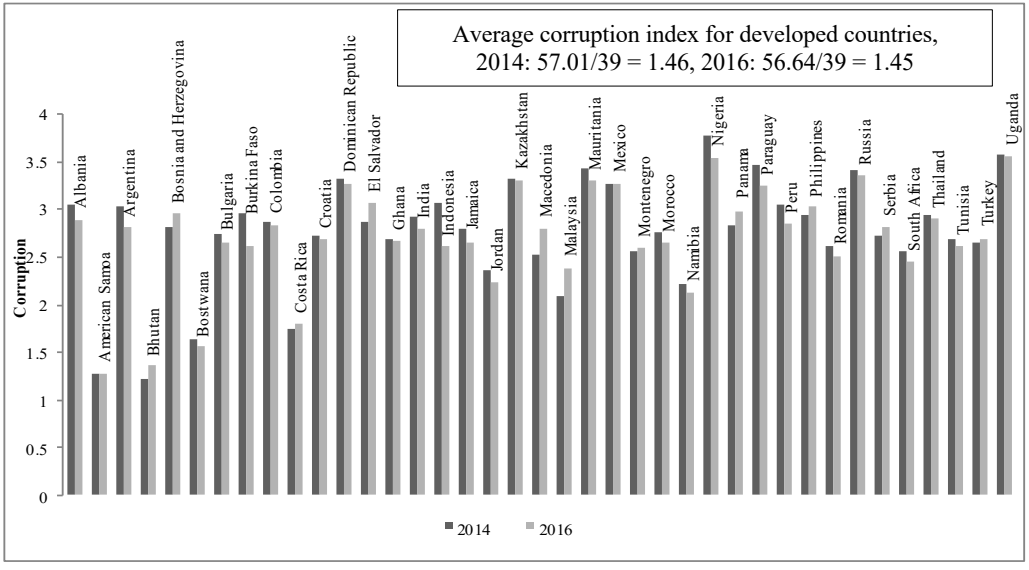
Note: Entrepreneurship is measured by new business density (NBD). The dot line indicates the average of NBD in developed countries.
Source: World Bank (2017c).

Although entrepreneurship in developing countries shows there is a significant improvement, currently, most developing countries suffer low and unsatisfactory in the level of entrepreneurship as compared to developed countries. From Figure 1, only Botswana, Bulgaria, and South Africa are succeeded in emulating the achievement in entrepreneurship of developed countries. Low entrepreneurship can contribute to many problems that may hinder economic growth. The pressure due to unemployment and poverty sometimes may lead people to be involved in crimes in order to find ways out and survival (Phillips & Land, 2012). The economy will continue to decline if the entrepreneurship level is low and unprogressive. Therefore, this situation has sparked our interest in investigating the factors which can help to promote entrepreneurship in developing countries.

Several studies have shown that various factors can affect entrepreneurship. Among the crucial factors at the individual level are individual entrepreneurial orientation, aspiration, and intention (Pathak et al., 2015; Park, 2017; among others), innovativeness, pro-activeness, and risk-taking behavior (Kreiser et al., 2013; Park, 2017; among others), and fear of failure, perceived capabilities, empathy, and self-efficacy (Pathak et al., 2015; among others). At the macro level, among the crucial determinants are innovation and technology opportunities (Park, 2017), external network (Estrin et al., 2013; Park, 2017; among others), national culture (Stuetzer et al., 2018; among others), education (Bae et al., 2014; among others), investment (Ghani et al., 2014; among others), GDP (Hoogendoorn, 2016; Dvouletý, 2017), trade (Bloom et al., 2016; Guerrero et al., 2017), unemployment (Congregado et al., 2012), and institutional quality (Dutta & Sobel, 2016; Avnimelech et al., 2014).

In line with Sara and Newhouse (1995), and Masron and Nor (2013), several recent past studies have also suggested that lower level, although preferably the absence of corruption can ease promote and encourage more entrepreneurship activities as well as new business start-up (Avnimelech et al., 2014; Dutta & Sobel, 2016). Besides, lower level of corruption in most developed countries has been cited as among the promoting factors leading to the prosperity of entrepreneurship activities (Avnimelech et al., 2014; Dutta & Sobel, 2016). Unfortunately, most of the developing countries are recording a decline in the corruption level as shown in Figure 2. If the declining pattern of corruption level continues in the long-run, it is predicted that corruption will be too low, the business environment will be so conducive and entrepreneurship activities can be automatically and aggressively activated. With the rapid development of entrepreneurship, the nation's end goal of becoming a higher income country with lower income inequality, as well as lower poverty level, can be achieved.

Figure 2: Corruption in the Selected Developing Countries



Note: The modified score ranges from 0 (the best) to 5 (the worst) using the recalculating formula COR=SCORE*-1+2.5. The higher score representing greater corruption. Average COR-Average of corruption for developed countries.
Source: World Bank (2017b).

Although Figure 2 shows a declining pattern of corruption level, the latest levels are still high relative to the average index for developed countries. Figure 2 also represents the primary characteristic of developing countries, which are always suffering from high corruption. Corruption has been regarded as a serious problem in the majority of the countries throughout the world and has become a global phenomenon, which may increase the burden of cost and reduce the amount of profit that entrepreneurs can be earning from entrepreneurship activities (Avnimelech et al., 2014). Interestingly, most of the past studies have focused solely on developed countries and at best-mixed countries with developed countries always dominate the sample (Avnimelech et al., 2014; Castano et al., 2015; Fuentelsaz et al., 2015; Aparicio et al., 2016; Hoogendoorn, 2016; Dvouletý, 2017). Hence, the results could be biased towards developed countries rather than developing countries. In the case of developing countries, the effect of corruption on entrepreneurship has not been purely confirmed by past studies. There is a potential reverse effect of corruption on entrepreneurial activities in highly corrupted countries that are against the conventional norms that corruption will negatively affect entrepreneurship. This study aims at complementing the gap by offering an investigation on the adverse effect, albeit the potentially 'positively' effect of corruption on entrepreneurship in developing countries.[1] Therefore, this study aims to investigate ***'what is the effect of corruption on entrepreneurship in developing countries?'*** For empirical analysis, this study employs Generalized Method of Moments (GMM) estimator using data on 48 developing countries from 2008 to 2016. The findings indicate that corruption has a significant and positive effect on entrepreneurship, suggesting that potential entrepreneurs may observe that the only way to start a business is to involve in corrupted activities.

The rest of the article is organized as follows: section 2 is the literature review, section 3 provides methodology, including model specification and the estimation procedure. The empirical results and discussion are reported in section 4 and finally, section 5 is the conclusion.

2. LITERATURE REVIEW

Based on the Eclectic Theory of Entrepreneurship by Verheul et al. (2002), entrepreneurship can be influenced by several factors such as technological development, economic opportunities, globalization, demographic, and institutional quality. The first indicator to represent technological development is education. In less-developed countries, education is crucial to develops human capital, self-confidence, ability, and skills to form a business (Oosterbeek et al., 2010; Bae et al., 2014; Fuentelsaz et al., 2015). In terms of the content of education, Bae et al. (2014) argue that relative to business education, entrepreneurship education is more positively related to a student's entrepreneurial intention. Bae et al. (2014) claim that students' attitudes and behaviors are affected by cultural effects resulted from education. This is because, when individuals have higher education levels, they place greater trust in their abilities and skills to undertake economic activities and also have a higher level of self-confidence to start a business (De Clercq & Arenius, 2006). Education also can increase the width of personal skills and might improve business performance (Doms et al., 2010). On the other hand, Van Der Sluis et al. (2008) report that in contrast to a wage-earner worker, education can reduce the likelihood of entering entrepreneurship. Besides that, the

[1] It is extremely important to keep in mind that the possible positive effect should be interpreted as entrepreneurs have no option that to pay bribe in order to start or continue their businesses.

perceived influence of several entrepreneurship courses on graduate needs for entrepreneurship education did not match with the actual outcomes in terms of entrepreneurial knowledge, attitudes, and skills (Oosterbeek et al., 2010). Therefore, this study expects that education has a positive effect on entrepreneurship.

*H_1 =There is a **positive** impact of education on entrepreneurship.*

The second indicator for technological development is investment. Investment in human and physical capital, basic utilities, and knowledge can promote new firm formation (Acs and Varga, 2005; Aterido et al., 2011; Ghani et al., 2014). Among the observed constraints that prevent new and small businesses in developing countries from growing are due to the lack of adequate infrastructural endowment such as roads and railways, basic utilities such as electricity, water supply and information communication technology networks (Aterido et al., 2011; Ghani et al., 2014). In addition, investments in R&D can create scientific knowledge combined with new technological advancements that can spur new business opportunities, which later to be shared with entrepreneurs (Aidis et al., 2008). Therefore, investment is essential to build and strengthen the entrepreneurship culture in a country. In a nutshell, this study hypothesizes that:

*H_2 =There is a **positive impact** of investment on entrepreneurship*

Basically, GDP per capita is used to capture value-added, efficiency, wealth, income, productivity, competitiveness, economic opportunities, and development of the country (Estrin et al., 2013). Dvouletý (2017), who uses a sample of Nordic countries, suggests that GDP positively affects entrepreneurship activities, which is in line with Koellinger & Thurik (2012). Higher GDP means higher income, indicating that the economy is growing and bringing in new opportunities to individuals to start a business as higher income also implies higher demand for variety of goods and services (Avnimelech et al., 2014). Therefore, positive GDP indicates that a country is in good condition and whatever sold will be demanded. Therefore, many past studies have emphasized that an increase in GDP would stimulate the economy by offering more business opportunities and encourage entrepreneurship growth (Dvouletý, 2017; Simón-Moya et al., 2014; Castano et al., 2015). Conversely, other past studies also report that GDP reduces self-employment because of the general trends of the information technology revolution, deregulation, and globalization (Noorderhaven et al., 2004; Bjornskov & Foss 2008). In other words, most development in the economy will be captured by giant companies, rather than by the micro and small enterprises. Therefore, GDP which represents economic opportunities in the countries has the following hypothesis:

*H_3 = There is a **positive impact** of GDP on entrepreneurship*

Globalization has been predicted to exert an impact on entrepreneurship in developing countries with trade can be considered as good representation. International trade can also encourage new business start-ups due to the increasing diversification of consumer preferences of goods and services (Bloom et al., 2016; Guerrero et al., 2017). Exports offer enormous opportunities for economies of scale and business expansion. Imports, on the other hand, may supply necessary inputs to support the domestic business. In short, trade will promote domestic productivity as well as encourage more development of new businesses from various industries. Sobel et al. (2007) also argue that countries that involve in trade will tend to have more entrepreneurship but at the same

time, may also suffer higher rate of business failure. However, high rate of business failure is not detrimental as it is a sign that many new combinations are being attempted and the market process is doing its job in sorting out the good ones from the bad ones. Due to the trade liberalization, existing businesses in India can use the output tariff reduction, lower cost of production, and increase associated profit to increase present productivity as well as create more opportunities for new business start-up by finance new products and services De Loecker et al. (2016). However, according to Gomes-Casseres (1997), trade offers many benefits to larger businesses, while micro and small businesses may face disadvantages due to high fixed costs, limited skills, and knowledge. Trade hurts the development of entrepreneurship in open countries. Autor et al. (2013) offer an analysis of the effect of Chinese import competition on US local labor markets and find that rising Chinese import causes higher unemployment due to fewer jobs offered by local businesses and a decrease in the number of local businesses due to higher competition by Chinese import. In the same vein, Guerrero et al. (2017) explore the effect of economic liberalization on different types of entrepreneurial activities in the OECD countries. By taking the possible impact of trade on entrepreneurship in developing countries based on the above discussion, the hypothesis is postulated as:

$$H_4 = \textit{Trade has a significant impact on entrepreneurship.}$$

Culture has also been said as crucial to entrepreneurship. At macro level, unemployment can indirectly represent the culture of the countries as it may also mean high illiteracy rates and so on. High unemployment often pushes people to create their own businesses. Specifically, when people still fail to find a job and being unemployed, they will find a way to escape from being unemployed by starting a business (Simón-Moya et al., 2014). According to Verheul et al. (2002), and Fuentelsaz et al. (2015), unemployment brings a positive impact on necessity entrepreneurship (small scale business) due to fewer options to find a job. This view is also supported by (Dvouletý, 2017), who suggests that the unemployment rate positively affect entrepreneurial activities. This is because, during the times of higher unemployment and limited job opportunities, people engage in entrepreneurship to survive. As stated by Fritsch et al. (2015), the role played by unemployment influences entries into entrepreneurship during the boom and recession periods in Germany. This is because unemployed people are more induced to become entrepreneurs during the recession period, a period where fewer jobs are available, and it is expected that new business formation will increase at a smaller scale. Based on past studies, this study assumes that:

$$H_5 = \textit{There is a } \textbf{\textit{significant}} \textit{ impact of unemployment on entrepreneurship.}$$

Finally, quality of institution always crucial to hinder or promote businesses and corruption could be a good indicator of the quality.[2] Basically, in any business, including entrepreneurship activities, profitability has been the primary input that motivates many to involve. Profitability, on the other hand, is a function of cost. Most costs are predictable and visible such as cost of inputs, rental fee, salary and wages. However, the biggest challenge to any business, especially to the micro, small and medium enterprises (MSMEs), which own very limited capital is hidden cost that suddenly appears. According to Sara and Newhouse (1995), which later extended by Masron and Nor (2013),

[2] According to Masron and Subramaniam (2020), after considering seriously various elements representing institutional quality, such as government effectiveness, rule of law, regulatory quality and corruption as defined by World Bank (2017b), although they could be defined differently, corruption is a good reflection of low government effectiveness, unclear rule of law as well as poor regulatory quality, or in short, to represent the quality of institution.

the hidden cost or sometimes referred to as indirect cost, can be due to the concept of bounded rationality and opportunism. Under the bounded rationality concept, there are two categories known as law and friendly government policies, which can trigger additional cost to a business if it has gone in the opposite direction. According to Sara and Newhouse (1995), there are five elements under the law, such as fair and equitable, the rule of law, international dispute settlement, consistent, and stable laws for the repatriation of earnings and capital and laws on compensation if a firm is nationalized. Meanwhile, the three elements belonging to friendly government policies include easy access to government agencies, post-approval services and simple requirements for visa, work permits, and import licenses. Finally, under opportunism, the two items are namely a stable and unambiguous commercial code to protect against dishonest local agents and intellectual property rights that are strictly enforced. Masron and Nor (2013) confirm this by examining the hypothesis using all components of governance quality on FDI inflows. In a nutshell, the quality of institution (IQ) matters a lot to businesses with corruption is one of them to justify the quality of the rest of the elements.

Either in the presence of sound policies but poor human quality or the absence of effective policies, corruption could undermine and destabilize the business situation. Corruption enhances uncertainty and may reduce the likelihood of an individual's intention to enter entrepreneurship due to the avoidance of being exploited by public agencies (Estrin et al., 2013; Pathak et al., 2015). Additionally, Bologna and Ross (2015) find that corruption can reduce the number of business establishments with small businesses that appear to be particularly affected by corruption in Brazil given the negative effect observed in their study. Avnimelech et al. (2014) also suggest that the impact of corruption on entrepreneurship could be more significant in developed countries relative to non-developed countries. The findings by Avnimelech et al. (2014) can probably explain the findings by Puffer et al. (2010) that entrepreneurs who face corruption in formal institutions cannot rely on informal institutions because it is weak in developed countries as entrepreneurs in non-developed countries' counterparts can do. As a result, entrepreneurs in developed countries often find it hard to deal with corruption rather than entrepreneurs in developing countries. In the same vein, Aparicio et al. (2016) find that control of corruption represented informal institutions has a positive impact but poses the smallest influence on opportunity entrepreneurship in Latin American countries as opposed to other countries in the sample. Regardless of the size of the coefficient, government role in ensuring low corruption is certainly welcome because of several benefits, namely the rate of new businesses creation will be higher and in turn, will offer substantial new tax collection for the government as well as creating a more stable political condition in a country (Aparicio et al., 2016). However, although Naude and Rossouw (2010), and Puffer et al. (2010) find that more corruption will result in fewer entrepreneurial activities, they expect that the relationship between corruption and entrepreneurship is non-linear. In other words, high corruption may force higher bribes by entrepreneurs and therefore, brings in positive association. After a certain level of low corruption, the association turns to be negative, where people may start to avoid entrepreneurship and may opt for employed workers.[3] In contrast to Dreher and Gassebner (2013), Bologna and Ross (2015) and Dutta and Sobel (2016) provide support for the '*Grease of the Wheels' (GoW)* hypothesis. The findings indicate corruption is regarded as the only way to start a business, particularly in those countries that have unlikely effective regulations. Given the

[3] On other perspective, similar to giant businesses that prefer to bribe in order to obtain certain economic rent, which is not possible under extremely transparent or low corruption, opportunity entrepreneurs may also reduce under a good control of corruption.

tendency for developing countries to suffer seriously from high corruption, this study predicts that the results could be positive. Hence, corruption is hypothesized as:

*H_6 =There is a **significant** impact of corruption on entrepreneurship*

3. METHODOLOGY

Based on the Eclectic Theory by Verheul et al. (2002), demand factors include technological development (*TECH*), economic opportunities (*ECO*) and globalization (*GLOB*), while supply factors include demographic (*DEM*) and institutional Quality (*INST*). Therefore, this study extends the Eq. (1) into specific factors within the supply and demand factors in the Eclectic Theory as follows:

$$ENT = f(TECH, ECO, GLOB, DEM, INST) \tag{1}$$

For technology development, education and investment are chosen as they are crucial to develop a nation. Investment can open up more opportunities for entrepreneurship (Ghani et al., 2014) and education can enhance human capital to start entrepreneurship culture (Fuentelsaz et al., 2015).[4] Regarding economic opportunities, this study utilizes GDP per capita as suggested by Dreher and Gassebner (2013), Avnimelech et al. (2014), Simón-Moya et al. (2014), Castano et al. (2015), Pathak et al. (2015), Hoogendoorn (2016), and Dvouletý (2017). The key reasons are GDP per capita captures broad aspects of economic performance such as the stage of development, level of productivity, income, competitiveness, market size, and wealth that can develop an individual's confidence in choosing to become an entrepreneur (Estrin et al., 2013). Meanwhile, globalization can be proxied by international trade (Fernandes & Paunov, 2010). Due to the integrated world, micro and small businesses may be particularly exposed to high pressure to compete with the foreign trade. Meanwhile, previous studies have also highlighted unemployment as among the crucial indicators for demographics (Simón-Moya et al., 2014; Fuentelsaz et al., 2015; Dvouletý, 2017). Hence at the national level, unemployment is chosen as a proxy for demographic, which is in line with Cueto et al. (2015). Finally, and to represent the main objective of this study, the institutional quality will be represented by corruption. Hence, based on the discussion above, the model for this study is expressed as follows:

$$\begin{aligned} \ln ENT_{i,t} = {} & \alpha_0 + \beta_1 \ln EDU_{i,t} + \beta_2 \ln INV_{i,t} + \beta_3 \ln GDP_{i,t} + \beta_4 \ln TRA_{i,t} \\ & + \beta_5 \ln UEM_{i,t} + \beta_6 \ln COR_{i,t} + \varepsilon_{i,t} \end{aligned} \tag{2}$$

Where, *EDU* denotes education, *INV* represents investment, *GDP* is proxied by GDP per capita, *TRA* stands for trade, *UEM* denotes unemployment, and *COR* stands for corruption. All variables enter in log form.

[4] Training and motivational workshops can also be part of investment. Also, to include investment in providing basic utilities and facilities. Education can also act as a medium to spread awareness about the important aspects of entrepreneurship. According to past studies, technology development can also be captured by innovation Schumpeter (1934), research and development (Audretsch et al., 2008), and human capital (Colombo & Grill, 2010).

3.1. Measurement and Data Sources

This study will be using the panel data covering the sample of 48 developing countries over nine years from 2008 to 2016. Table 1 summarizes the lists of variables, their proxies and sources.

Table 1: Description and Sources of the Variables

Variables	Definition/Measurement	Source
Global Entrepreneurship Index (GEI)	14 entrepreneurship pillars in 3 sub-indices attitudes, abilities, and aspirations.	Acs et al. (2017)
New business density (NBD)	New registrations per 1,000 people aged between15-64.	World Bank (2017c)
Education (EDU)	Education expenditure (% of GNI).	World Bank (2017a)
Investment (INV)	Gross fixed capital formation (% of GDP).	World Bank (2017a)
GDP per capita (GDP)	GDP divided by midyear population.	World Bank (2017a)
Trade (TRA)	Trade (% of GDP).	World Bank (2017a)
Unemployment (UEM)	Total unemployment (% of total labor force).	World Bank (2017a)
Corruption (COR)	The modified score ranges from 0 (the best) to 5 (the worst) and reverses the measure by multiplying by -1. The recalculating formula: COR=SCORE*-1+ 2.5.	Own calculation based on the original data from World Bank (2017b)

Notes: GED1=Global Entrepreneurship Development Index. Original SCORE for control of corruption is between -2.5 (the worst) to 2.5 (the best).

Two different proxies of entrepreneurship, known as Global Entrepreneurship Index (GEI) and New Business Density (NBD) are used in this study. GEI is chosen because GEI comprises both individual and institutional variables that correspond to the micro and macro levels, and then make it worth to explain entrepreneurship (Acs et al., 2008). Nevertheless, GEI only contains businesses in the formal sector, which require business registration and follow the rules and regulations imposed on the business (Fritsch et al., 2015; Dutta & Sobel, 2016). As stressed by Acs et al. (2008), when dealing with business barriers such as corruption, it is more suited to formal-sector businesses measured by NBD. Therefore, to complement GEI, this study also applies NBD. The data for this study obtained from several resources. For the dependent variable, the entrepreneurship data obtained from 2 different indicators, Doing Business Indicator (World Bank, 2017c) and Global Entrepreneurship and Development Index (Acs et al., 2017). Meanwhile, the explanatory variables are taken from the World Development Indicators (World Bank, 2017a), and Worldwide Governance Indicators (World Bank, 2017b).

3.2. Estimation Procedure

GMM estimators are suggested by Holtz-Eakin et al. (1988), Arellano and Bond (1991), Arellano and Bover (1995), and Blundell and Bond (1998) to encounter the endogeneity and bias as a result by explanatory variables that are not strictly exogenous. The GMM estimator contains lagged dependent variable highlighting the importance of previous entrepreneurship in determining present entrepreneurship. In the absence of national culture information that varies across the year, lagged entrepreneurship could be a good proxy (Kreiser et al., 2013; Kristjánsdóttir et al., 2017). Hence, under the GMM technique, taking X to represents all explanatory variables, Eq. (3) will be as follows:

$$ENT_{i,t} = \alpha ENT_{i,t} + \beta X_{i,t} + \mu_{i,t} + \varepsilon_{i,t} \quad (3)$$

Where, $ENT_{i,t}$ is entrepreneurship in country i at time t, and α and β are parameters to be estimated and $X_{i,t}$ is a vector of explanatory variables. The term $\mu_{i,t}$ represents unobserved country-specific time-invariant (random effect) which are independent and identically distributed over the countries. The term $\varepsilon_{i,t}$ is independent and identically distributed. The term $\mu_{i,t}$ and $\varepsilon_{i,t}$ assume to be independent over all periods and for each country, i. The explanatory variables such as education, investment, GDP per capita, trade, unemployment, and corruption are treated as endogenous. The model is estimated using the Arellano & Bond dynamic GMM estimator (Arellano & Bond, 1991). The estimator introduced by Arellano & Bond (1991) is also known as the different-GMM that uses lagged values of the first-difference of the endogenous variables as instruments. Arellano and Bond (1991) suggest to differentiate the regression equation to eliminate the country-specific effect as follows:

$$ENTi_{,t} - ENT_{i,t-1} = \alpha(ENT_{i_{,t-1}} - ENT_{i,t-2}) + \beta\left(X_{i,t} - X_{i_{,t-1}}\right) + \left(\varepsilon_{i,t} - \varepsilon_{i,t-1}\right) \quad (4)$$

However, these lagged levels can be poor instruments for first-differences. In order to avoid downward bias in the computation of standard errors, system-GMM estimator is used. There are some advantages of using the system-GMM estimator. Firstly, system-GMM does not eliminate cross-country variation and it mitigates potential biases of the difference estimator in small samples. Secondly, system-GMM can also control the potential endogeneity of all regressors. In specifying the dynamic panel system estimation, this study has selected the two-step system-GMM because it corrects the residuals for heteroscedasticity. The assumption of no autocorrelation in the residuals is crucial as past lagged variables were used as instruments for the dependent variables. Therefore, this study recommends the system-GMM estimator as a consideration in the subsequent empirical analysis.

Besides that, to address the consistency of the GMM estimator, two specification tests have been conducted. First, the serial correlation tests the null hypothesis of no first-order autocorrelation or AR(1) and no second-order autocorrelation or AR(2). The rejection of the null hypothesis of the absence of AR(1) and the failure to reject the absence of AR(2) mean the model is valid and correctly specified. The second test is the Hansen test for over-identifying restrictions by testing the validity of the instruments. The soundness of the instruments is essential in generating consistent and efficient estimates. The null hypothesis is the independence of the instruments and the error terms. Failure to reject the null hypothesis of the Hansen test indicates that the instruments used are valid and the model is correctly specified (Hansen, 1982).

4. RESULTS AND DISCUSSION

Descriptive and correlation analyses are omitted to conserve space but are available upon request. The results of the regression analysis for corruption and entrepreneurship are shown in Table 2. Before interpreting the results of regression, it is necessary to check the four specification tests, namely, lagged variable, first-order autocorrelation or AR(1), second-order autocorrelation or AR(2) and Hansen test for the appropriateness of GMM estimator (Arellano & Bond, 1991). The lagged dependent variable remains significant and positive across all regressions, confirming the

dynamic characteristics of model specification. The results for AR(1), AR(2), and Hansen test are shown at the bottom of Table 2. The first-order autocorrelation rejects the null hypothesis of no autocorrelation, the second-order autocorrelation fails to reject the null hypothesis of no autocorrelation, and the Hansen test fails to reject the null hypothesis of no over-identification of restriction in all regressions implying that the instruments are valid. Hence, Model in Table 2 can be considered as a reliable model. Besides that, the results of the difference Sargan (Dif-Sar) statistics are also reported as a test of the additional moment conditions used in the system-GMM estimators relative to the corresponding first difference-GMM estimator. Failure to reject the null hypothesis of the validity of the level of moment conditions confirms the validity of the system-GMM (Blundell & Bond, 1998). System-GMM which achieved a greater efficiency than the first difference-GMM for the model can be examined by the Dif-Sar. Since the results of Dif-Sar cannot reject the null hypothesis, system-GMM is preferred. Due to that, the discussion of the result is based on the two-step system-GMM.

Table 2: Regression Results [DV: ln*ENT*]

	Different-GMM		**System-GMM**		**Different-GMM**		**System-GMM**	
	1-Step	2-Step	1-Step	2-Step	1-Step	2-Step	1-Step	2-Step
	Model 1: ln*ENT* = ln*NBD*				**Model 2: ln*ENT* = ln*GEI***			
ln*ENT (-1)*	0.416*	0.106*	0.778**	0.912***	0.122*	0.118*	0.106*	0.561**
	[1.86]	[1.66]	[2.19]	[2.83]	[1.87]	[1.88]	[1.66]	[2.03]
ln*COR*	0.292*	0.252**	0.550*	0.534**	0.078**	0.098**	0.408*	0.980*
	[1.83]	[2.29]	[1.89]	[2.06]	[2.33]	[2.34]	[1.72]	[1.69]
Model Criteria								
AR(1)	0.001	0.002	0.058	0.077	0.001	0.004	0.005	0.002
AR(2)	0.165	0.158	0.246	0.268	0.191	0.214	0.211	0.129
Hansen Test	0.164	0.164	0.389	0.389	0.195	0.195	0.261	0.261
Dif-Sar	-	-	0.930	0.943	-	-	0.968	0.970
Obs.	432	432	432	432	432	432	432	432

Note: Asterisks *, **, and*** denote significant at 10%, 5%, and 1% levels, respectively. Figures in [ ] stand for t-statistics. The values of the Hansen and AR tests stand for the p-value. The model is estimated using the robust estimation.

The discussion will start with the effect of lagged entrepreneurship. The lagged entrepreneurship is found to be highly significant and have a positive effect on entrepreneurship. Apart from justifying the appropriateness of the dynamic panel model, the results also highlight the importance of past entrepreneurship in determining the current entrepreneurship in developing countries. Since we have difficulty to find the natural culture index at the national level, which varies across years, lagged entrepreneurship could be a good proxy. Past culture of entrepreneurship will have a strong bearing on today's decision by the rest to be entrepreneurs. These findings are also supported by Kreiser et al. (2013) and Kristjánsdóttir et al. (2017).

With regards to the first objective, referring to the results of the two-step system-GMM, the coefficient of corruption *(COR)* is positive. It indicates that 1 percent increase in corruption level is associated with about 0.534 percent increase in new business density and 0.980 percent increase in the global entrepreneurship index. These results confirm the findings of Leff (1964), Dreher and Gassebner (2013), and Bologna and Ross (2015), who state that corruption is the only way for individuals and potential entrepreneurs to start a business in highly corrupted countries, thereby, an increase in corruption leads to an increase in the number of new business start-up. A possible

explanation for this finding might be because corruption represents the main characteristic of developing countries. According to the World Bank (2017b) and Transparency International (2017), developing countries have a higher degree of abuse and misuse of funds by public officers for private gain, which implies that the practice of corruption is high. Because of this, corrupted activities of giving and receiving bribes to be generally accepted and high in practice among the developing countries. In general, individuals and potential entrepreneurs in developing countries who have intentions to involve in entrepreneurial activities have no choice other than to be involved in bribery. However, they do it unwillingly in order to get start and progress in the business.

Since corruption is likely unavoidable in highly corrupted countries, individuals and potential entrepreneurs are forced to pay some "extra charges" by public officers. These practices make individuals and potential entrepreneurs to not be able to run away but to go through this process. For instance, bribes can happen throughout the entrepreneurial process such as getting the licence, permit, location, and business approval (Dreher & Gassebner, 2013; Bologna & Ross, 2015). This result further supports the idea of previous studies which claim that corruption has a specific role to act as a *'speed of money'* or *'grease the wheels'* by favourable individuals and potential entrepreneurs to enter into entrepreneurship and develop business much faster (Leff, 1964; Dreher & Gassebner, 2013; Bologna & Ross, 2015).

The model estimated in Table 2 is the most basic with corruption being the only factor. Although it is sufficient in the context of our first objective, we further investigate the effect of corruption on entrepreneurship, where five factors are taken into account, as suggested by the Eclectic Theory of Entrepreneurship. According to the Eclectic Theory of Entrepreneurship, entrepreneurship is influenced by many other factors based on demand and supply (Verheul et al., 2002). Hence, Table 3 presents the result of augmented Model 1, which includes education, investment, GDP, trade, and unemployment. Model criteria at the bottom of the table justify that two-step system-GMM is valid and the best model. Hence, the remaining discussion focuses mainly on the results of two-step system-GMM.

Table 3: Regression Results of Augmented Model [DV: ln*ENT*]

	Different-GMM		**System-GMM**		**Different-GMM**		**System-GMM**	
	1-Step	2-Step	1-Step	2-Step	1-Step	2-Step	1-Step	2-Step
	Augmented Model 1: ln*ENT* = ln*NBD*				**Augmented Model 2: ln*ENT* = ln*GEI***			
ln*ENT (-1)*	0.25*	0.20*	0.36*	0.32*	0.08*	0.30*	0.38*	0.29*
	[2.62]	[2.86]	[2.34]	[2.92]	[1.95]	[2.79]	[2.36]	[2.93]
ln*EDU*	-0.93*	-0.38*	-0.13*	-0.13*	-0.43*	-2.63*	-0.10*	-0.13*
	[-2.3]	[-1.82]	[-2.44]	[-1.72]	[-2.07]	[-2.13]	[-1.97]	[-1.73]
ln*INV*	0.59*	0.36*	0.08*	0.22*	0.37*	0.38*	0.19*	0.09*
	[1.69]	[1.84]	[2.65]	[1.71]	[1.72]	[1.69]	[1.81]	[1.69]
ln*GDP*	0.56*	0.72*	0.06*	0.08*	0.61*	0.69*	0.11*	0.17*
	[1.97]	[1.65]	[1.80]	[1.68]	[2.54]	[2.03]	[2.89]	[2.89]
ln*TRA*	0.13*	0.38*	0.24*	0.24*	0.04*	0.08*	0.09*	0.07*
	[2.11]	[2.53]	[2.37]	[2.33]	[1.88]	[1.84]	[2.30]	[2.40]
ln*UEM*	0.54*	0.05*	0.02*	0.06*	0.04*	0.05*	0.04*	0.06*
	[2.57]	[2.16]	[1.80]	[1.85]	[2.43]	[2.14]	[2.43]	[2.17]
ln*COR*	0.84*	0.22*	0.12*	0.44*	0.42*	0.21*	0.23*	1.33*
	[1.82]	[2.19]	[1.90]	[2.39]	[1.89]	[2.19]	[1.69]	[2.27]

Table 3: continued

Model Criteria								
AR(1)	0.07	0.07	0.01	0.02	0.00	0.01	0.00	0.00
AR(2)	0.83	0.69	0.64	0.63	0.88	0.83	0.24	0.21
Hansen Test	0.71	0.98	0.95	0.95	0.67	0.67	0.99	0.99
Dif-Sar	-	-	0.94	0.79	-	-	0.65	0.87
Obs.	432	432	432	432	432	432	432	432

Note*:* Asterisk * denotes significant at least at 10% critical value. Figures in [ ] stand for t-statistics. The values of the Hansen and AR tests stand for the p-value. The model is estimated using the robust estimation.

Based on the findings in Table 3, corruption (*COR)* has consistently exerted a significant and positive impact on entrepreneurship in developing countries. These findings are found to be consistent with the results presented in Table 2. It shows that 1 percent increase in corruption is associated with about 0.441 percent increase in new business density and 1.337 percent increase in the global entrepreneurship index. These results are also supported by the results of studies conducted by Dreher and Gassebner (2013) and Bologna and Ross (2015) who claim that in order to form a business, individuals or potential entrepreneurs are forced to involve in bribery. Basically, giving and receiving bribe could happen in the process of early business start-up and post-entry business progress.

For further analysis, a robustness test is performed to confirm the findings further. The robustness test checks the consistencies and validity of the result in Table 2 and Table 3 by adding the number of countries to both samples, which are only available for either measurement of new business density or global entrepreneurship index, but not for both. The new countries will be 77 countries for new business density and 65 countries for the global entrepreneurship index over the same period from 2008 to 2016. The results are presented in Table 4.

Table 4: Regression results of Augmented Model with additional countries [DV: ln*ENT*]

	Different-GMM		**System-GMM**		**Different-GMM**		**System-GMM**	
	1-Step	2-Step	1-Step	2-Step	1-Step	2-Step	1-Step	2-Step
	Robust Model 1: ln*ENT* = ln*NBD*				**Robust Model 2: ln*ENT* = ln*GEI***			
ln*ENT (-1)*	0.15*	0.30*	0.30*	0.15*	0.13*	0.18*	0.40*	0.37*
	[2.23]	[2.47]	[2.59]	[2.31]	[2.13]	[2.20)	[3.91]	[3.38]
ln*EDU*	-0.14*	-0.70	-0.14*	-0.15*	-2.39*	-0.58	-0.41*	-0.08*
	[-1.95]	[-1.33]	[-2.94]	[-1.88]	[-1.81]	[-1.47]	[-1.99]	[-2.59]
ln*INV*	0.07*	0.12*	0.11*	0.06*	0.83*	0.56	0.08*	0.91*
	[1.96]	[1.85]	[1.99]	[1.87]	[2.36]	[1.44]	[1.75]	[2.15]
ln*GDP*	1.75*	1.78*	0.07*	0.06*	0.84*	0.69*	0.09*	0.11*
	[1.78]	[2.27]	[2.65]	[2.23]	[1.90]	[2.05]	[2.65]	[2.84]
ln*TRA*	0.14*	0.18*	0.23*	0.24*	0.16*	0.09*	0.14*	0.18*
	[1.94]	[2.22]	[2.49]	[2.36]	[2.17]	[2.20]	[2.12]	[2.30]
ln*UEM*	0.07*	0.06*	0.02*	0.04*	0.08*	0.11*	0.05*	0.04*
	[2.37]	[2.54]	[2.06]	[1.91]	[1.96]	[2.17]	[2.01]	[2.65]
ln*COR*	0.91*	0.15*	0.29*	0.18*	1.12*	2.68*	0.10*	0.44*
	[1.76]	[1.97]	[2.25]	[2.15]	[2.48]	[2.08]	[1.84]	[1.96]

Table 4: continued

Model Criteria								
AR(1)	0.01*	0.05*	0.00*	0.00*	0.01*	0.01*	0.01*	0.00*
AR(2)	0.12	0.10	0.49	0.48	0.62	0.86	0.37	0.45
Hansen Test	0.99	0.99	0.99	0.99	0.24	0.24	0.74	0.74
Dif-Sar	-	-	0.88	0.78	-	-	0.46	0.70
Obs.	693	693	693	693	585	585	585	585

Note*:* Asterisk * denotes significant at least at 10% critical value. Figures in [ ] stand for t-statistics. The values of the Hansen and AR tests stand for the p-value. The model is estimated using the robust estimation.

Based on the two-step system-GMM, the notable similar findings show that corruption, education, investment, GDP, trade, and unemployment are statistically significant determinants of entrepreneurship as in the augmented models presented in Table 3 previously. For our core variable, the sign and significance of the coefficient of corruption is retained in both specifications. Likewise, the coefficient of corruption remains positive and significant at 5 percent.

5. CONCLUSION

The importance of entrepreneurship as an engine of economic growth is already recognized. However, developing countries currently suffer low and unsatisfactory in the level of entrepreneurship. As high corruption has been the primary attribute of most developing countries, this study suspects that corruption may dampen entrepreneurship in developing countries. We use data on 48 countries from 2008 to 2016 and employ GMM estimator to estimate the models. The findings from various specifications suggest that corruption is significant and positively affect entrepreneurship. The positive impact of corruption on entrepreneurship indicates that individuals or potential entrepreneurs in developing countries observe that they have no choice except to involve in corrupted activities to start a business. Corruption is a normal norm and phenomenon in most developing countries and hence, most likely an unavoidable action for people who intend to do business, especially beginners. Corruption presumably affects entrepreneurship through uncertainty and higher costs. While the results may misleadingly suggest that corruption is good, corruption remains not only a cost to entrepreneurs but also creates uncertainty in their business. The positive effect simply suggests that the level of corruption is so critical and instead, it may hamper many attempts to be an entrepreneur. While successful entrepreneurs might be there, the unsuccessful entrepreneurs could be more than those successful, particularly to those with minimal capital to start with. The results stress the need to fight corruption to encourage entrepreneurship in the most conducive way. This study highlights several policy recommendations to reduce corruption such as to establish anti-corruption policies (as well as agencies) and strategies towards developing higher integrity such as conducting moral-related and value-enhancing programmes to especially government officers, seeking to increase individual accountability and awareness as well as purify inner behaviour, alongside the improvement of the existing likely flawed policies as well as strengthening the enforcement and penalty in combating corruption.

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