

The Impact of Corruption on the Effectiveness of Fiscal Policy Stabilizing Economy: A Case Study of the ASEAN – 5 Countries

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Abstract

This study aims to examine the effectiveness of fiscal policy in stabilizing output fluctuation in the business cycle by taking account of corruption level for five countries (Malaysia, Singapore, Thailand, the Philippines, and Indonesia) in the Association of Southeast Asian Nations (ASEAN) from 1996 to 2019. Based on voracity effect theory, a poor institutional quality due to high corruption levels put more pressure on government spending during economic booms which limited fiscal space during economic recessions. This effect could reduce the effectiveness of fiscal stabilization on output fluctuation in business cycle. This study utilizes Fully Modified Ordinary Least Square (FMOLS), where the results address fiscal stabilization in the long run perspective. The result suggests that discretionary fiscal policy is countercyclical and can stabilize output fluctuation by 7 percent. When the interaction term of discretionary fiscal with corruption variables is included, the stabilizing effect reduces from 0.7 percent to 0.36 percent. The result shows there is a small reduction in countercycle response for Singapore, contrary to Malaysia, which has a large reduction in countercycle response, as the interaction terms are included. Meanwhile, fiscal stabilization for Indonesia, Thailand, and the Philippines is slightly reduced to a small and insignificant effect.

Keywords: Fiscal Policy, Business Fluctuations, Cycles, Institutions and Growth

JEL Classifications: E32, E62, O43, P48

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1. Introduction

In New Keynesian economics theory, the ideal way for an economy to be better off is when the economy stays at or near its potential path which signifies stability against exogenous shocks. According to Okun's Law, the potential path is a long run level of production of goods and services when labor, capital, and available technology are at full employment level (Owyang & Sekhposyan, 2012). An economic shock could affect the stability of an economy to be near its trajectory or potential path. A financial crisis hinders aggregate output from achieving its stability by drifting the aggregate output below the potential output path. Therefore, the economy can be considered as experiencing a recession period when its aggregate output is below the potential path. Meanwhile, economic booming caused by an increase in aggregate demand shifts aggregate output above potential output which pushes the inflation rate to a high level.

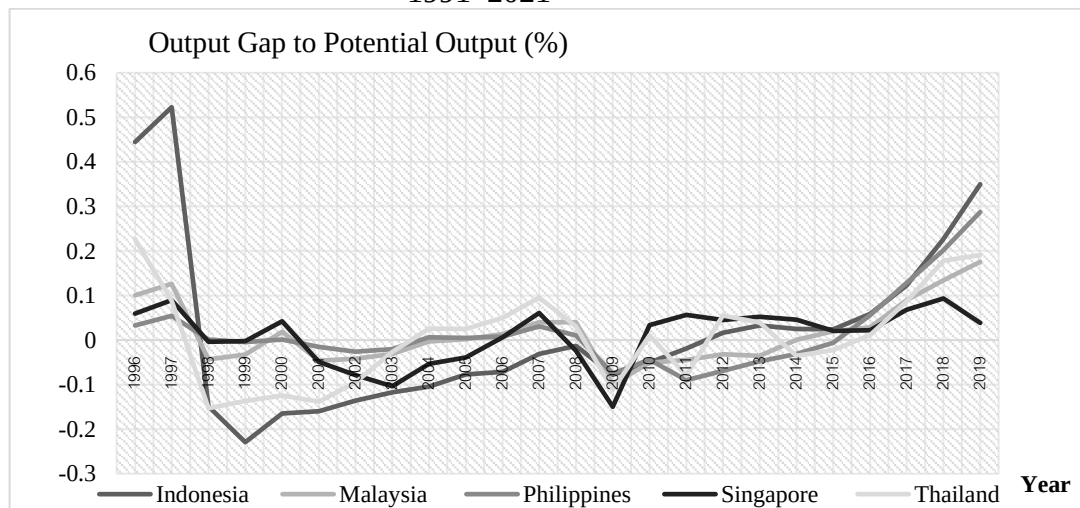
Fiscal policy can be a useful instrument in correcting the economy toward its potential path and achieving its aggregate output stability. For instance, government expenditure such as expenses on cash transfer, infrastructure, and incentives for business expansion could multiply aggregate demand by stimulating more household consumption and investment levels in the short run. It brings aggregate output to potential output during economic downturn. This type of fiscal behavior is known as a countercycle response, which is contrary to a procycle response that amplifies aggregate output and widens the output gap in the business cycle. However, the cyclicity of fiscal policy in stabilizing the economy is subjected to many factors such as corruption level, public debt (Combes et al., 2017), monetary policy and credit constraint (Eskesen, 2009).

There are two important insights on the link between fiscal policy and business cycle changes that could be derived from previous studies. First, previous researches have explored the impact business cycle changes on fiscal policy to determine fiscal cyclicity behavior either countercycle or procycle response (Dincă et al., 2020; Ahmmed & Jonaed, 2020; Kassouri & Altıntaş, 2021; Aldama & Creel, 2022; Mawejje & Odhimabo, 2022; Haan & Gootjes, 2023; Afonso & Carvalho, 2022). However, this fiscal cyclicity behaviour is often tested against other explanatory variables. As a result, information on the stabilizing effect of fiscal policy on the business cycle may be overlooked because the impact of fiscal policy variables on business cycle indicators is not directly examined. Secondly, some of these previous studies provide evidence on the relationship between fiscal policy and business cycle changes in a dynamic relationship. In this respect, fiscal stabilization could have influence on business cycle change in the long run. This is because dynamic adjustment due to the expansion of economies policies may experience a longer adjustment to equilibrium at a time when the economy is facing contraction (Nuru & Gereziher, 2020). Moreover, fiscal policy could have a persistent or long-lasting effect of changes on economic activity, as suggested by Fatás & Mihov (2001) and Gechert et al. (2018). To our knowledge, there is limited study focuses on the effect of fiscal policy on business cycle changes in the long run. In addition, the corruption level could influence the fiscal stabilization effect, where it weakened fiscal policy to stabilize output fluctuation in the business cycle. Therefore, the purpose of this study is to test the effectiveness of fiscal policy to stabilize output fluctuation in the business cycle with respect to the corruption level in the long run.

1.1 Economic Stability in the ASEAN –5

Output gap is aggregate output minus potential output. It is commonly used to reflect the stability of an economy. In the context of the ASEAN-5, the stability of aggregate output is shown in Figure 1.

Figure 1: Output Gap to Potential Output (%) in ASEAN-5 Countries, 1991–2021



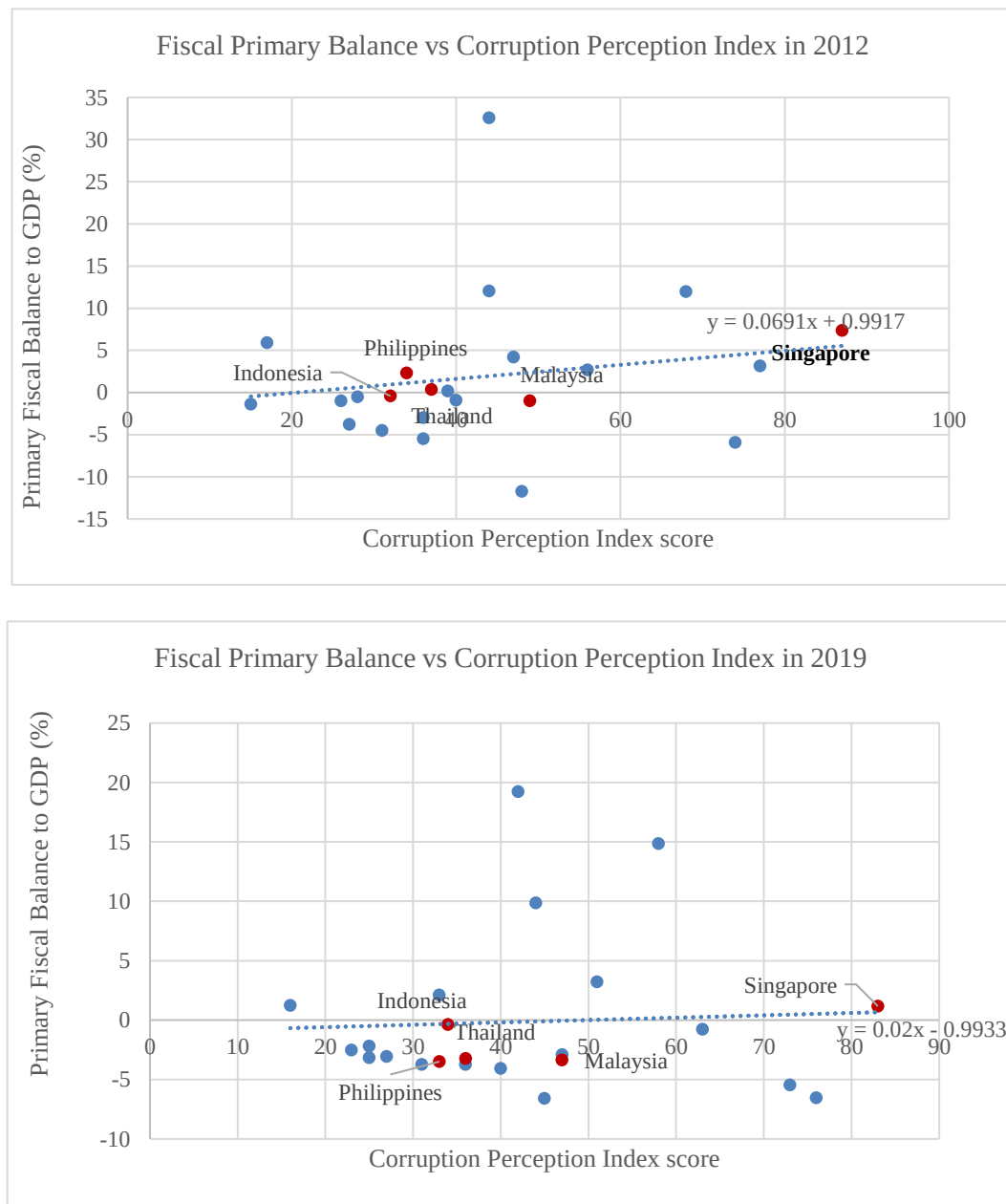
Note: The cyclical trends of aggregate output are estimated using the Hodrick-Prescott (H.P.) filter procedure. The horizontal axis at the value of zero in this figure represents the potential output path.

Source: Author's Calculation

In the last two decades (1996 – 2019), this region underwent two common shocks, which are known as the Asian Financial Crisis (AFC) from 1998 to 1999 and the Global Financial Crisis (GFC) from 2008 to 2009. The AFC was due to a steep depreciation of local currency caused by a sudden capital withdrawal from the region. It triggered a great uncertainty in the region's financial market. Thus, this crisis caused a widened negative gap, which is below the potential output as shown in Figure 1. The effect of the crisis seemed to persist in Thailand and Indonesia, where it took several years for these countries to come back to their potential output. Meanwhile, the stability attained by Malaysia and Singapore in 2000 was short-lived after AFC, where these countries registered negative output gaps from 2001 to 2003. Similarly, the GFC is due to the subprime mortgage crisis in the United States that scattered across the globe and weakened international market demand. The crisis caused collapsed export demand and a negative output gap in the region. Negative output gaps seemed to be persistent for Malaysia and the Philippines after the GFC from 2010 to 2013.

The concept of the voracity effect provides insight on how corruption is associated with the fiscal policy response in the business cycle. It pertains the tendency of excessive government spending during economic booms, as governments cannot resist the temptation or political pressures to increase spending (Frankel et al., 2013). This scenario is related to the poor institutional quality that increases the corruption level corresponding with the abuse of power for private gain in government institutions (Achim et al., 2018). It could undermine fiscal space by deteriorating the surplus in fiscal balance or widening the fiscal deficit that will be utilized during economic recession. Thus, the voracity effect is usually associated with fiscal deficit as a result of excessive spending during good times due to low institutional quality.

Figure 2: Scatter Plot of Primary Fiscal Balance to GDP and Corruption Perception Index in Selected Asian Countries in 2012 and 2019



Note: The Corruption Perception Index (CPI) represents the perceived corruption level in a country's public sector. Low CPI score indicates high corruption level.

Source: Asian Development Bank (2023); Transparency International (2012, 2019).

In order to justify the voracity effect in the ASEAN-5 countries, Figure 2 shows the association between fiscal balance and the Corruption Perception Index (CPI). Fiscal balance for the Philippines and Thailand in 2012 registered a surplus despite these countries being subjected to a low CPI score. Meanwhile, Indonesia, with a lower CPI score, has recorded a deficit in fiscal balance. On the contrary, Malaysia, with a much higher CPI score, has experienced a deficit in fiscal balance. Singapore had the largest surplus in fiscal balance, corresponding with the highest CPI score in the ASEAN-5 countries. As a comparison, the position of fiscal balance in ASEAN-5 countries, except Singapore, turned to be a deficit in 2019, while CPI score remained at a low level. Therefore, this suggests that there is a potential voracity effect due to corruption factor

that influences the fiscal space in the ASEAN- 5 countries which in turn, affects the role of fiscal policy in stabilizing the economy.

1.2 Theory of Corruption and Fiscal Policy Effectiveness

Institutional quality factors provide an insight into the effectiveness of fiscal policy in stabilizing an economy over the business cycle. Tornell & Lane (1999) and Alesina et al. (2008) argued that the quality of institutions could play an important role in shaping the behavior of fiscal policy over the business cycle. Such a weak institutional factor is typically subjected to corruption practices in government institutions. It contributes to a weak control on restricting government overspending during economic booms and also encourages tax evasion, which lowers government revenue. During good times, governments can build up fiscal surpluses by decreasing their spending and increasing tax revenue. However, pressures on policymakers to spend the fiscal surplus prevent fiscal space from being used in bad times. The greater the scale of the political factors, such as political instability, ethnic and religious polarization, and high income and education inequality, the greater the pressure to spend on fiscal surplus. Thus, it reduces the capacity to pursue expansionary fiscal policy during bad times (Ahmad et al., 2021).

The abuses of power can undermine the effectiveness of fiscal policy in stabilizing the economy. It is manifested by multiple interest groups who are seeking to secure a greater share of national wealth, which is causing a large public expenditure on their behalf, particularly during economic booms (Tornell & Lane, 1999; Akitoby et al., 2006). Rather than implementing public investment projects, the budget allocated for infrastructure is diverted to government officers or elected politicians for private use. When the government declares a tender for some projects, rather than giving it to the lowest bidding company, government officers or politicians take bribes and distribute the projects to companies that are related to the politicians' company (Khan, 2011). Research has shown that countries with higher levels of corruption tend to experience slower economic growth. The diversion of public funds into private pockets weakens public services and infrastructure, hindering long term economic development. Moreover, the lack of accountability and transparency in fiscal policies erodes investors' trust in the government, leading to decreased foreign direct investment and domestic capital flight. The pervasive nature of abuses of power in fiscal policy undermines economic stability by distorting market mechanisms and perpetuating inequality, ultimately impeding overall economic progress (Drezner et al., 2021). Additionally, Pappa et al. (2015) argued that high-level corruption brings more losses in government revenue (due to the misuse of power), inducing tax hikes due to the need of financing government debt and increasing output and unemployment losses. It could contribute to the procyclicality of fiscal policy.

The procyclical bias of fiscal policy is more pronounced in large countries where multiple tiers of government level are practiced. Tornell & Lane (1999) argued that the more power is diffused among a number of government branches, the more witness a high intensity of fiscal needs; therefore, it causes excessive government consumption. Meanwhile, Khan (2011) and Ain & Mumtaz (2022) argued that large countries such as China, Pakistan, and India tend to suffer from a greater procyclical response due to the decentralized government factor. A decentralized government is typically associated with multiple tiers of government levels, where it results authority losing focus on corruption control. Thus, they tend to create excessive government spending as government revenue is increasing during economic booms, which in turn, constrains government expenditure during economic recession.

In the taxation aspect, Achim et al. (2018) argued that taxpayers may easily circumvent under low institutional quality because of low governance efficiency. When fiscal pressure increases due to the raising income and corporate tax burden, households tend to give more bribes to officers in evading tax payment and reducing government revenue during economic booms. In a country with low supervision or control on corruption, tax collector inspectors tend to accept bribes from taxpayers as rewards for false reporting of income higher than their wage rate (Gauthier & Goyette, 2016). Moreover, the lack of supervision could lower the tax rate and government revenue, as the cost of tax evasion is much cheaper when the tax rate is high, thereby forcing the government to decrease the rate (Invanya et al., 2016). Nguyen (2018) found that bribery tends to increase in situations where tax collectors and taxpayers interact frequently during tax collection, particularly when the state oversight over customs and tax administrators is weak. As a result, individuals or firms in the official sector tend to bribe tax collectors in order to evade taxes or improperly benefit from tax exemptions hence, it reduces tax revenues and limited fiscal space. Additionally, the unofficial sector's tax evasion often threatens the government's ability to provide public goods, which increases borrowing and the nation's debt. Households usually perceive that their interests or preferences are properly represented in political institutions that influence their willingness to contribute tax. A corrupted government erodes the household's trust in government accountability. It causes household unwillingly to pay tax and motivates them to evade tax payment. A limited tax revenue due to tax evasion causes a country to deliver a sizeable fiscal tool to stabilize the economy without having increases in public debt. However, Invanya et al. (2016) and Cavoli & Wilson (2015) argued that tax evasion could potentially lead to greater private consumption that can stabilize the economy as lost revenue through tax leakage will cause bribe takers to not move funds offshore and spending the bribe revenue domestically.

Transparency, as opposed to corruption, is a very important aspect in enhancing countercycle behavior of fiscal policy. Andersen & Nielsen (2010) incorporated the degree of transparency with the cyclicity of fiscal policy. It reflects on how the government is willing to disclose the position of government finance to the public, where households can easily detect excessive government spending. Therefore, it reduces the procyclical bias during economic booms in OECD countries. On the contrary, Tornell & Lane (1999), and Pereira & Lee (2013) argued that the lack of transparency in fiscal spending, resulting from the prevalence of corrupt practices, could undermine the optimal impact of fiscal discretion in stabilizing the economy. This is due to a substantial error in decision-making and misallocation of discretionary fiscal resources in the short run.

Meanwhile, Alesina et al. (2008) argued that policy failure is associated with a political agency problem. In an economic boom setting, households optimally demand more public goods and lower tax rates. Furthermore, imperfect information prevents households from observing the current government borrowing position. The lack of transparency increases the potential for manipulating the budget around election periods. Consequently, politicians may take government revenue for granted to secure votes from households, rather than addressing the public debt level. Therefore, it is difficult for the government to resist pressure from voters against spending cuts, leading to excessive public consumption and inducing a fiscal pro-cyclical bias (Dincă et al., 2020). In addition, the political cycle affects how public managers choose to share information and the level financial transparency demanded (Puron-Cid et al., 2019). Political rivalry can boost fiscal transparency while, political polarization may reduce transparency and raise government debt and budget imbalances (Alt & Lassen, 2006). These political dynamics have important implications for fiscal management, as greater fiscal transparency can strengthen government accountability and improve revenue collection. Conversely, the

lack of transparency is caused by corrupted public officers and politicians in government. The costs of the goods and services required to fund public projects and deliver public services can be artificially raised by corrupted public officers (Carole, 2021). It may result in more public spending, larger fiscal deficits, and more borrowing to balance the deficit as the quantity and magnitude of the projects expand.

2. Empirical Reviews

There are a number of studies in the existing literature linking fiscal policy to aggregate output, economic growth, or output gap in explaining the cyclicity of fiscal policy by using cross-sectional, time-series and panel data analysis. Previous studies had clearly suggested that fiscal policy is procyclical bias during economic downturns in 19 OECD countries (Aldama & Creel, 2022), in Bangladesh (Ahmmed & Jonaed, 2020), and in developing countries (Heimberger, 2023). Discretionary fiscal is procyclical during recession in 19 Euro area countries (Afonso & Carvalho, 2022); in Nigeria (Olakojo et al., 2020); in European Union (Haan & Gootjes, 2022); and in Sub-Saharan Africa (Kassouri & Altıntaş, 2021). Meanwhile, government expenditure is procyclical, and tax is countercyclical in the East African Community (Mawejje & Odhimabo, 2022). Fiscal policy is found to be countercyclical during expansionary phases and procyclical during recessions in Croatia (Arčabić & Banić, 2021); countercyclical in OECD countries (Fatas & Mihov, 2012); and countercyclical in Nigeria (Olaoye et al., 2021). These findings denote that the cyclicity of fiscal policy behavior over the business cycle is inconclusive.

In the context of institutional quality, various authors are concerned about the relationship between fiscal policy and corruption level empirically. Most studies support the evidence that corruption level increases the procyclicity in fiscal policy. For example, Alesina et al. (2008) and Agoba et al. (2019) found that fiscal policy is more pronounced in more corrupt democracies in developing countries. More disciplined fiscal policies can be achieved through strong institutions that reduce corruption. However, developing strong institutions should be complemented with growing the economy, as highly developed economies ensure effective functioning of institutions. Khan (2011) investigated the relationship between the cyclicity of fiscal policy with aggregate output and output volatility and argued that the procyclical response in developing countries, particularly in East Asian countries is due to the corruption factor. Similarly, Herrera et al. (2019) revealed that institutional quality, which is subjected to perceived corruption, is associated with procyclical government spending bias in developing countries. Temsumrit (2021) also found that institutional quality is associated with procyclical fiscal policy in democratic and non-democratic developing countries. Meanwhile, Nguyen et al. (2020) addressed control of corruption having a positive effect on improving fiscal balance, suggesting better supervision of corruption levels in Asia Pacific countries. Ahmad et al. (2021) suggested that countries with low political corruption and high-level democracy that reflect institutional quality reduce fiscal procyclicity. Similarly, Hussain et al. (2021) found that Ireland's fiscal policy is found to be countercyclical in the presence of effective political and economic institutions with highly structured and well-functioning governance. Specifically in cross-sectional dependence among the oil-rich countries, Çiçekçi & Gaygısız (2023) found that countries with poor institutional quality levels could undermine resource fund allocation, leading to high fiscal procyclicity. Meanwhile, El-Khishin & Zaky (2021) suggested that fiscal deficit due to poor political and budgetary institutions has led to fiscal procyclicity in the long run in Egypt.

The finding of Frankel et al. (2013) shows that there is a causal link from countries with stronger institutions to less procyclical or more countercyclical fiscal policy. Similarly, Carneiro & Garrido (2016) suggested that countries with stronger institutions are associated with less procyclical fiscal policy in industrial and developing countries by controlling the endogeneity of institutions and other determinants of fiscal policy. Calderón & Schmidt-Hebbel (2008) confirmed that emerging countries with poor institution quality are unable to perform countercyclical fiscal policy. In contrast, Haan & Gootjes (2023) found that institutional quality factors such as control of corruption are not related to the prevalence of procyclicality of fiscal policy in 32 OECD countries. Also, Thornton (2008) suggested government consumption is less procyclical in low-income African countries that are more reliant on foreign aid inflows and less corrupt and more procyclical in countries with unequal income distribution and more democratic. Ghosh & Neanidis (2017) found bureaucratic corruption tends to reduce tax revenue raised from households and heighten the volume of government spending but reduce the effectiveness of government spending.

Taking all these studies together, it synthesizes that corruption level indeed has a strong influence on fiscal cyclicity, leading to questioning the effectiveness of fiscal stabilizing output fluctuation in the business cycle. While addressing corruption as a part of institutional quality issues, previous studies have predominantly examined the impact of business cycle indicators on fiscal variables with a particular focus on identifying whether government spending tends to be excessive during periods of economic expansion or contraction. As a result, the impact of fiscal variables, particularly automatic stabilizers and discretionary fiscal policy on the business cycle was still limited, which requires further exploration. In terms of measurement, control of corruption (COC) and the corruption perception index (CPI), which hold a wide definition of corruption, are utilized in examining corruption level on fiscal cyclicity behavior (Alesina et al., 2008; Khan 2011). CPI highlights perceptions of corruption in the public sector. COC focuses on broader perception to the extent public power is exercised for private gain and the capacity of institutions to control corruption, incorporating a broader governance dimension, including enforcement capacity and institutional integrity.

3. Methodology

Discretionary fiscal policy is an instrument for fiscal policy to stabilize the economy in a business cycle. Since this instrument is formulated based on the government's decision that is subjected to the lags of information, decision, and implementation, it can be potentially influenced by the corruption level. According to Galí & Perotti (2003), discretionary fiscal is captured by the part of fiscal balance that is not influenced by cyclical changes. In other words, discretionary fiscal is defined as what budget balance position would have prevailed if the aggregate output were at potential output, also known as cyclical adjusted balance (CAB). This study follows Debrun and Kapoor (2010) to measure CAB, which is shown in Equation (1):

$$CAB_t = r_t \left(\frac{GDP_t^*}{GDP_t} \right)^{\varepsilon_R - 1} - g_t \left(\frac{GDP_t^*}{GDP_t} \right)^{\varepsilon_G - 1} \quad (1)$$

where; CAB_t , GDP_t^* , r_t , g_t , ε_R and ε_G are the cyclically adjusted balance, potential GDP, government revenue to GDP, government expenditure to GDP ratio, the elasticity of government revenue, and the elasticity of government expenditure, respectively. The setting value for ε_R is 1 and ε_G is 0.

The output fluctuation model is based on Debrun et al. (2008), Debrun & Kapoor (2010), Eller et al. (2016), and Munir & Riaz (2019), where it pertains to the effect of fiscal tools on output fluctuation. In order to reflect the fluctuation of output in the business cycle, the output gap is utilized as a dependent variable, where it can be written as:

$$\ln \text{GAP}_{it} = \beta_0 + \beta_2 \ln \text{CAB}_{it} + \beta_3 \ln \text{INT}_{it} + \beta_4 \ln \text{CRDT}_{it} + \beta_5 \ln \text{OPN}_{it} + \varepsilon_{it} \quad (2)$$

where i and t are suffixes for country and year. GAP_{it} , CAB_{it} , INT_{it} , CRDT_{it} and OPN_{it} are the ratio of absolute value GDP gap to GDP potential, cyclical adjusted balance, real interest rate, total domestic credit to GDP ratio, and total trade to GDP ratio at time t in country i , respectively. Lastly, ε_{it} is an error term and $\ln$ represents a logarithmic form. The β_2 coefficient captures the impact of fiscal policy on output fluctuation. A negative β_2 coefficient signifies that the fiscal tool reduces output; hence, it indicates the stabilizing role of the fiscal tool on output fluctuation. The second model is based on Debrun et al. (2008), which includes an interaction term variable in a non-linear fiscal stabilization model. In the context of this study, the interaction term between corruption variables with CAB is introduced in Model [2]:

$$\begin{aligned} \ln \text{GAP}_{it} = & \alpha_0 + \alpha_2 \ln \text{CAB}_{it} + \alpha_3 \ln \text{INT}_{it} + \alpha_4 \ln \text{CRDT}_{it} + \alpha_5 \ln \text{OPN}_{it} \\ & + \alpha_6 \ln \text{CAB}_{it} \cdot \text{CORR}_{it} + \varepsilon_{it} \end{aligned} \quad (3)$$

In the presence of the interaction term, the joint effect of fiscal tools with corruption level on the output gap is captured. To determine the effectiveness of fiscal stabilization on the output gap, the estimated α_2 will be compared with the β_2 coefficient. If $\alpha_2 < \beta_2$, it means the presence of a corruption factor, the stabilizing effect of CAB is weakened and becomes less effective.

In Model [3], there are two measurements of institutional quality that are used to reflect the level of corruption at the country level. First, CPI pertains to the perception of expert and businesspeople on how corrupted the public sector is in a country (Transparency International, 2023). Secondly, COC represents the perceptions of the extent to which public power is exercised for private gain (World Bank, 2023). COC is based on aggregating multiple data sources, such as Economist Intelligence Unit and the World Economic Forum to reflect perceived levels of public sector corruption, whereas CPI is constructed by using a wide variety of data sources, including expert assessments and surveys of citizens and businesspeople. Both measurements offer standardized scores that allow for meaningful cross-country comparisons.

This study addressed the endogeneity problem that arises from a reverse causality relationship business cycle between fiscal variables which would cause bias in OLS regression where the error term in a regression of fiscal policy on the output gap will likely be positively correlated with the output gap. To overcome this problem, most of study utilized Two-Stage Least Squares (2SLS) or Generalized Method of Moments (GMM) that incorporate a large sample size with a small time dimension (Heimberger, 2023). In this study, the Fully Modified Ordinary Least Squares (FMOLS) approach is an appropriate technique to address endogeneity and serial correlation in estimation specifically for small sample sizes and the relatively large time dimension dataset setting.

Table 1: Data Definition

Variable	Definition	Source
Aggregate output	Real GDP	Asian Development Bank
Discretionary fiscal	Cyclical adjusted balance (%)	Asian Development Bank
Openness	Total trade to GDP (%)	The World Bank
Interest rate	Real interest rate (%)	The World Bank
Credit Development	Domestic credit to GDP (%)	The World Bank
Corruption	Corruption Perception Index	Transparency International
Corruption	Control for corruption	Worldwide Governance Indicator

Source: Various dataset from international databases

The analysis begins with a stationarity test on each data series in Table 1 to determine the order of integration, whether at level or first difference. For this test, the Levin, Lin and Chu (LLC) test and the Im, Pesaran and Shin (IPS) test are utilized. Secondly, the Pedroni cointegration test and the Kao cointegration test are performed to validate the presence of a long run relationship among the variables with long run characteristics. Then, FMOLS and DOLS estimations are executed to determine the effect of fiscal policy and other variables on output fluctuation in the long run. Lastly, the Dumitrescu- Hurlin causality test is used to determine the directional of causality between corruption, fiscal tools, and output fluctuation.

4. Empirical Analysis

The finding of unit root properties based on the LLC and the IPS test are presented in Table 2. The results support the evidence that all variables are non-stationary at level but stationary at first difference. Therefore, all variables are considered to be integrated at order one, I(1).

Table 2: The Result of LLC and IPS Panel Unit Root Test

Test	Variable	Constant		Constant + Intercept	
		Level	First Difference	Level	First Difference
LLC	Output Gap	1.822 (0.965)	-6.204** (0.000)	-0.892 (0.186)	-5.245** (0.000)
	CAB	8.768 (0.999)	-10.164** (0.000)	10.741 (0.999)	-11.487** (0.000)
	Credit Development	-0.580 (0.280)	-5.751** (0.000)	-1.174 (0.120)	-8.724** (0.000)
	Openness	0.835 (0.798)	-8.257** (0.000)	0.422 (0.663)	-6.636 (0.000)
	Interest Rate	-0.481 (0.315)	-13.845** (0.000)	1.013 (0.845)	-13.578** (0.000)
	CPI	0.549 (0.708)	-5.664 (0.000)	0.273 (0.606)	-5.410** (0.000)

Table 2: The Result of LLC and IPS Panel Unit Root Test (cont.)

Test	Variable	Constant		Constant + Intercept	
		Level	First Difference	Level	First Difference
LLC	COC	-0.973 (0.165)	-12.010** (0.000)	0.158 (0.562)	-10.249** (0.000)
IPS	Output Gap	-1.202 (0.114)	-3.130** (0.009)	-0.807 (0.209)	-5.014** (0.000)
	CAB	-0.439 (0.330)	-11.017** (0.000)	0.643 (0.741)	-12.211** (0.000)
	Credit Development	-1.034 (0.150)	-6.471** (0.000)	-1.278 (0.100)	-9.016** (0.000)
	Openness	0.465 (0.671)	-9.403** (0.000)	-0.185 (0.426)	-8.568** (0.000)
	Interest Rate	-1.216 (0.112)	-3.689** (0.001)	-0.498 (0.308)	-2.334** (0.009)
	CPI	-1.239 (0.107)	-9.446** (0.000)	-1.114 (0.132)	-8.397** (0.000)
	COC	-1.075 (0.141)	-5.287** (0.000)	-0.651 (0.257)	-6.626** (0.000)

Note: (1) *t* -statistics probability in parenthesis []; (2) ** denotes significance level at 5% significance level

Source: Author's calculation

With the same integrating order of all the series, it is appropriate to perform the Pedroni and the Koa Cointegration tests to detect the presence of cointegration or long run relationships among the variables. The result of the cointegration test is reported in Table 3. There are three models tested where the Model 1 is based on Equation (2) where interaction terms of corruption variable with CAB are not controlled. The result confirms the presence of long run cointegration in first model as most statistics in Pedroni cointegration test and Kao integration test are statistically significant.

Table 3: The Result of the Pedroni and Kao Cointegration Test

Pedroni Cointegration Test	Without Interaction Term (1)		With Interaction term CPI (2)		With Interaction term COC (3)	
	Intercept	Intercept + trend	Intercept t	Intercept + trend	Intercept	Intercept t + trend
Panel <i>v</i> - statistics	1.98** [0.02]	1.30* [0.09]	-0.14 [0.55]	-0.52 [0.69]	1.36* [0.08]	1.47* [0.07]
Panel <i>p</i> – statistics	-2.41** [0.00]	-1.06 [0.14]	0.36 [0.35]	1.04 [0.85]	-1.36* [0.08]	0.54 [0.71]
Panel <i>t</i> – statistics	-5.52** [0.00]	-4.34** [0.00]	-4.47** [0.00]	-2.12* [0.01]	-5.84** [0.00]	-3.05** [0.00]
Panel ADF – statistics	-5.56** [0.00]	-3.97** [0.00]	-2.47** [0.00]	-3.22* [0.00]	-6.01** [0.00]	-3.13** [0.00]
Group <i>p</i> – statistics	-1.22 [0.11]	0.30 [0.62]	0.79 [0.78]	1.76 [0.96]	0.59 [0.72]	1.43 [0.92]
Group <i>t</i> – statistics	-5.10** [0.00]	-3.00** [0.00]	-4.04** [0.00]	-2.71** [0.00]	-2.90** [0.00]	-2.63** [0.00]
Group ADF – statistics	-5.20** [0.00]	-2.69** [0.00]	-2.66** [0.00]	-3.23** [0.00]	-2.98** [0.00]	-2.27** [0.01]

Table 3: The Result of the Pedroni and Kao Cointegration Test (cont.)

Kao Cointegration Test	Without Interaction Term (1)	With Interaction term CPI (2)	With Interaction term COC (3)
ADF	-7.00** [0.00]	-7.49** [0.00]	-11.44** [0.00]

Note: (1) standard error are in parenthesis []; (2) ** and * denote significance level at 5% and 10% significance level, respectively

Source: Author's calculation

The model 2 and model 3 are based on Equation (3) where interaction term CPI and COC with CAB are included. Most of statistics in Pedroni and Kao cointegration test result are significant. This result supports the evidence of long run relationship in both models. These result enables this study to estimate FMOLS and DOLS on the models.

The results of FMOLS and DOLS estimation are presented in Table 4. The estimated coefficient from the models can be interpreted as long term elasticities. In Model 1, the coefficients for FMOLS and DOLS estimations are statistically significant and negative. It denotes 1 percent of GAP associated with the reduction of the output gap about 0.7 to 0.77 percent. The result supports that CAB can stabilize output fluctuation in the ASEAN- 5 countries. This result is in line with Debrun & Kapoor (2010), who suggested fiscal policy could dampen output fluctuation in the business cycle in the case of new emerging countries. This result supports that discretionary playing an important role as a shock absorber to stabilize the ASEAN-5 countries in the long run.

Table 4: FMOLS and DOLS Estimation Result of Fiscal Stabilization
Dependent Variable: Absolute Output Gap

Variables	FMOLS			DOLS		
	1	2	3	1	2	3
CAB	-0.70** [0.01]	-0.36** [0.01]	-0.36** [0.01]	-0.77** [0.15]	-0.62** [0.14]	-0.52** [0.15]
Openness	-0.12** [0.01]	-0.35** [0.01]	-0.29** [0.03]	-0.30 [0.28]	-0.50** [0.24]	-0.17 [0.26]
Credit Development	0.42** [0.06]	0.40** [0.02]	0.35** [0.03]	0.66** [0.23]	0.84** [0.22]	0.76** [0.22]
Interest rate	-0.34 [0.20]	-0.29 [0.56]	-0.19 [0.27]	-0.50* [0.15]	-0.58** [0.14]	-0.40** [0.16]
CAB*CPI	-	0.78** [0.02]	-	-	0.63* [0.20]	-
CAB*COC	-	-	0.79** [0.02]	-	-	0.74** [0.22]

Note: (1) standard error is in parenthesis []; (2) ** denotes significance level at 5% significance level

Source: Author's calculation

With the interaction term corruption perception index and CAB in Model 2, the estimated coefficients are negative but slightly decreased to 0.36 and 0.62 for FMOLS and DOLS estimation, respectively. After the interaction term is included, a 1 percent increase in CAB reduces the output gap by 0.36 percent in the long run. This means that the stabilization effect on output fluctuation decreases when the corruption perception index is taken into account. The estimated interaction term coefficient is found to be significant and positive. This means that the joint effect of CAB and CPI contributes to increasing output fluctuation. When the interaction terms CAB and COC are present in

Model 3, the estimated coefficients are negative and decreased to 0.36 for FMOLS and 0.52 for DOLS. Thus, these results indicates that the corruption variables seem to deteriorate the effectiveness of CAB to reduce output fluctuation. The scenario is consistent with the voracity effect, which causes a non-optimal fiscal effect in stabilizing the economy as it is associated with excessive spending during economic booms (Tornell & Lane, 1999; Alesina et al., 2008). As a consequence, limited fiscal space could delay the adjustment process to equilibrium.

At the individual country level, Table 5 presents the stabilization effect of fiscal policy in the ASEAN-5 countries. In Model 1, the CAB coefficient is found to be negative and significant with the exception of Thailand. The estimated CAB for Singapore is -1.42, suggesting the strongest stabilizing effect of CAB among the countries. Meanwhile, the smallest stabilizing effect of CAB is in Indonesia, with the lowest significant estimated CAB coefficient of -0.35. As a comparison to Model 1, the estimated CAB coefficients decrease from 1.42 to 1.35 and 1.38 in Model 2 and Model 3, respectively, for Singapore when the interaction terms CPI and COC with CAB are included. For Malaysia's case, there is a large difference in the impact of discretionary fiscal on output fluctuation, where the estimated CAB decreases from 1.27 to 0.51 and 0.46 in Model 2 and Model 3, respectively. On the contrary, the estimated CAB coefficient decreases and is insignificant for the case of Indonesia and the Philippines and Thailand. This result suggests that discretionary fiscal policy is slightly becoming ineffective to stabilize the output gap as the interaction terms are included.

The result suggested that the effectiveness of fiscal stabilization depends on the level of corruption for each country. According to Alesina et al. (2008) and Agoba et al. (2019), a highly developed country tends to be associated with effective functioning of institutions. Thus, a stronger institutional quality (low corruption level and high transparency level) could lead to a less procycle or more countercycle fiscal policy (Frankel et al., 2013; Ahmad et al., 2021). In the context of ASEAN-5 countries, Singapore is considered as the most developed countries by income per capita followed by Malaysia, Thailand, Indonesia, and the Philippines. This rank can sync with the corruption level by Transparency International (2023), where the corruption can be arranged from the lowest to highest: Singapore (5th), Malaysia (57th), Thailand (108th), Indonesia (115th), and the Philippines (115th). The result reveals that, Singapore with lowest corruption perception index, has registered a small decline in fiscal stabilization as the corruption variable is controlled. Meanwhile, there is a large decline in the effect of stabilization for Malaysia as it corresponds with a modest corruption level. For the worst case, discretionary policy in Thailand, Indonesia, and the Philippines is not useful to stabilize output fluctuation, as these countries are associated with a high corruption perception index (high corruption level).

Table 5: FMOLS Result of Fiscal Stabilization for each the ASEAN-5 Countries
Dependent Variable: Absolute Output Gap

Country	Variables	1	2	3
Indonesia	CAB	-0.35**[0.03]	0.02 [0.02]	0.04[0.03]
	Openness	-1.55**[0.08]	-1.42**[0.03]	-1.18**[0.05]
	Credit Development	0.34*[0.06]	0.73**[0.03]	0.36**[0.04]
	Interest rate	-0.73*[0.11]	-0.49**[0.05]	-0.54**[0.08]
	CAB*CPI	-	1.23**[0.03]	-
	CAB*COC	-	-	0.94**[0.04]

Table 5: FMOLS Result of Fiscal Stabilization for each the ASEAN-5 Countries (cont.)
Dependent Variable: Absolute Output Gap

Country	Variables	1	2	3
Malaysia	CAB	-1.27**[0.06]	-0.51**[0.03]	-0.46**[0.02]
	Openness	0.27**[0.08]	-0.03[0.02]	-0.00[0.01]
	Credit Development	1.07**[0.39]	0.19**[0.09]	0.04[0.04]
	Interest rate	0.05**[2.61]	0.01**[0.00]	-0.00[0.00]
	CAB*CPI	-	0.95**[0.04]	-
	CAB*COC	-	-	1.00**[0.02]
Philippines	CAB	-0.37**[0.02]	0.09[0.07]	-0.05[0.06]
	Openness	0.48**[0.06]	0.00[0.11]	0.69**[0.11]
	Credit Development	0.54**[0.06]	0.74**[0.10]	1.25**[0.08]
	Interest rate	-0.87*[0.12]	-0.86**[0.20]	-0.63**[0.20]
	CAB* CPI	-	1.02**[0.12]	-
	CAB*COC	-	-	0.28**[0.11]
Singapore	CAB	-1.42**[0.02]	-1.35**[0.02]	-1.38**[0.03]
	Openness	-1.25**[0.16]	-1.59**[0.15]	-1.53**[0.23]
	Credit Development	-0.36**[0.07]	-0.38*[0.07]	-0.39**[0.09]
	Interest rate	0.24**[0.02]	0.30**[0.02]	0.25**[0.03]
	CAB*CPI	-	0.16**[0.01]	-
	CAB*COC	-	-	0.02**[0.01]
Thailand	CAB	-0.06[0.15]	-0.05[0.13]	0.03[0.13]
	Openness	1.46**[0.60]	1.26**[0.55]	0.56[0.54]
	Credit Development	0.53**[0.25]	0.74**[0.23]	0.50**[0.22]
	Interest rate	-0.39**[0.11]	-0.41**[0.10]	-0.01[0.13]
	CAB*CPI	-	0.56**[0.21]	-
	CAB*COC	-	-	1.71**[0.34]

Note: (1) standard errors are in parenthesis []; (2) ** denotes significance level at 5% significance level

Source: Author's calculation

Table 6: Dumitrescu & Hurlin Granger Causality Test Result

Variables	Z-bar tilde Statistic	Directional of Causality
GAP does not Granger – cause CAB	4.587**[0.00]	Bidirectional GAP ↔ CAB
CAB does not Granger – cause GAP	26.879**[0.00]	
GAP does not Granger – cause CPI	1.447[0.14]	No directional
CPI does not Granger – cause GAP	1.021[0.30]	
GAP does not Granger – cause COC	7.658**[0.00]	Bidirectional GAP ↔ COC
COC does not Granger – cause GAP	3.174**[0.00]	
CAB does not Granger – cause CPI	1.696*[0.08]	Bidirectional CAB ↔ CPI
CPI does not Granger – cause CAB	1.699*[0.08]	
CAB does not Granger – cause COC	1.570[0.16]	Unidirectional CAB ← COC
COC does not Granger – cause CAB	2.998**[0.00]	

Note: (1) p -value are in parenthesis []; (2) ** and * denote significance level at 5% and 10% significance level, respectively

Source: Author's calculation

Table 6 shows the causal relationship between the variables GAP, CAB, CPI, and COC. The granger causality shows the bidirectional relationship that runs between GAP

and CAB. It means that CAB can have a direct influence on GAP, and at the same time, GAP could directly cause CAB. The result reveals a directional relationship between CAB and corruption perception index and a unidirectional relationship between CAB and corruption control. Thus, the corruption perception index and corruption control could have directly influenced CAB. Also, the result suggests a bidirectional relationship between GAP and corruption control. However, there is not a direct effect of the corruption perception index on GAP, as causality tests suggest there is no directional relationship between the corruption perception index and CAB, whereas, in conclusion, the causality provides evidence that the corruption perception index and corruption control have an indirect effect on stabilizing output by influencing the effect of CAB on GAP. However, the causality test also suggests that there is a direct effect that is running from corruption control on GAP.

5. Conclusion, Policy Implication and Limitation

There are three key findings that could be drawn from this study. First, discretionary fiscal plays a significant role in reducing output fluctuation to potential output in the long run where the fiscal stabilization effect is varied for each of the ASEAN-5 countries. Second, the stabilization effect turned out to be weakened as the interaction term of corruption variables was controlled, suggesting that the corruption factor could directly influence the effectiveness of fiscal stabilization in the long run. Third, the effectiveness of fiscal stabilization seems to be dependent on the corruption level. For instance, Singapore, with a strong institutional quality, exhibits the strongest fiscal stabilization due to its low corruption level, while Malaysia poses a reduced fiscal stabilization as this country displays a low level of institutional quality. Meanwhile, the fiscal stabilization effect is rather limited in Indonesia, Thailand, and the Philippines, demonstrating a negative influence from low institutional quality.

Although the estimated drop in fiscal impact from 0.7% to 0.36% may seem small, it has important policy implications. This different is the loss of fiscal effectiveness due to corruption. More importantly, this finding highlights the hidden cost of corruption in managing the economy. In countries with high levels of corruption, governments not only have less ability to use fiscal tools effectively but also face lower trust in their policies. Anti-corruption reforms can restore or amplify the effectiveness of countercyclical policies, such as stimulus during downturns.

Therefore, the policy implications drawn from our study underscore the urgent need for comprehensive reforms in fiscal governance across the ASEAN-5 region. Policymakers are strongly encouraged to prioritize institutional strengthening initiatives aimed at bolstering transparency, accountability, and governance frameworks. By addressing corruption and fortifying institutional integrity, governments can significantly enhance the efficacy of fiscal policy in mitigating economic volatility and fostering sustainable development. Furthermore, a concerted emphasis on transparency and accountability is imperative, necessitating the implementation of measures to promote open budgetary deliberations, establish robust oversight mechanisms, and enact anti-corruption reforms. Additionally, there is a pressing need for policymakers to recalibrate fiscal frameworks to ensure responsiveness to prevailing economic conditions, mitigating procyclical biases, and aligning fiscal responses with both stabilization and sustainability goals.

This study also acknowledges a limitation in measuring corruption levels at the country level. Due to the lack of comprehensive data on corruption across the ASEAN-5 countries, the analysis primarily relies on the Control of Corruption (COC) and

Corruption Perceptions Index (CPI), which mainly capture administrative-type corruption. In contrast, data on procurement-related corruption are only available for a limited number of countries. As a result, this study is unable to compare different types of corruption across the ASEAN-5 nations. This limitation highlights the need for future research to explore various forms of corruption using more detailed and comprehensive data sources.

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