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The Political Stability – Inflation Nexus in South East Asia countries: Does Shadow Economy Moderate?

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ABSTRACT

In recent years, the issues of the shadow economy and inflation, particularly in developing countries, have gained relevance and attracted huge attention in economic debates. This study investigates the relationship between political stability, shadow economy and inflation while explicitly accounting for the presence of the shadow economy in 8 ASEAN countries over the 2000 to 2017 period. The research analyzed data derived from the World Development Indicators of the World Bank and Medina & Schneider (2019). The study employs the dynamic ordinary least squares (DOLS) and fully modified ordinary least squares (FMOLS), which allow cross-sectional dependence and slope homogeneity in panel data analysis to investigate the relationship between shadow economy, political stability, and inflation. The results indicate that the higher level of the shadow economy contributes to the increasing inflation rate. However, the more political stability leads to the lower level of inflation. In addition, the impact of political stability on inflation rate really depends on the size of the shadow economy. The research could make substantial contributions to the ASEAN economies. The study provides empirical evidence for policymaker to consider when choosing optimal policies to manage inflation, political stability and policies related to limiting the size of shadow economy for sustainable development.

INTRODUCTION

The issue of inflation, particularly in emerging market, continues to attract lot of attention of economist as well as non-economists. Although there are some dissents regarding the particular reasons and channels through which inflation happens, it is generally accepted that inflation is impacted by two essential sources, including excess aggregate demand surplus, and the cost-push effect (Durguti et al., 2021). However, due to its strong political economy aspects, inflation requires a wider context to understand its determinants (Leeper, 2010). Our literature review indicates that one key variable which has largely been neglected in existing empirical studies is the shadow economy.

The shadow economy refers all legal, economic, and productive activities contributing to official GDP if recorded (Hassan & Schneider, 2016). The more shadow economy is neglected in public policies, the more its growth in the developing countries (La Porta & Shleifer, 2014). In these countries, shadow economy outputs constitute about 30 per cent of GDP and account on average 70 per cent of employment (Loayza, 2016).

A large shadow economy not only makes erosions in the tax base but also impedes implications for stabilization policy. In these circumstances, the government that is uncertain about its revenue base is more likely to reach for short term measures at the cost of policy consistency. The shadow economy impact monetary policy outcomes because it is related with a higher demand for currency, and fiscal policy outcomes because of its effect on the collected tax revenue. The existence of a shadow economy undermines policy outcomes even in the presence of political stability (Buehn et al., 2015).

This line of reasoning leads to the conjecture that the systemic weaknesses entailed by a considerable shadow economy undermine the advantages of political stability. Thus, this study empirically tests the relationship between inflation, the shadow economy, and political stability. This is done in the context of 8 countries in the Association of Southeast Asian Nations (ASEAN) over the 2000 to 2017 period with the multivariate econometric model.

The study contributes to several strands of the extant literature. First, to the best of our knowledge, this is the first paper to explore the impact of political stability on inflation with the presence of the shadow economy in the ASEAN countries. Second, it contributes to the empirical research on drivers of inflation, including Edwards & Tabellini (1991), Cukierman et al. (1992). Although Cukierman et al. (1992) stress that political stability is one of the prerequisites for reforms that improve the efficiency of the tax system, they do not provide any evidence of a relation between the shadow economy, inflation, and political stability. By specifically incorporating the informal economy in our model, we fulfill this gap. Third, we focus on a long-term relationship between public expenditure and the shadow economy using the dynamic ordinary least square (DOLS) and fully modified ordinary least square (FMOLS) estimation methods.

Besides this introduction, the remaining part of the paper is divided into five sections. Literature review is presented in Section 2. Section 3 discusses the data and research methodology. Empirical findings and discussions are shown in Section 4, while the conclusions and policy implications in Section 5.

1. LITERATURE REVIEW

Shadow economy or the informal economy is a set of economic activities that take place outside the mainstream economic context. Dada & Ajide (2021) argue that although income in this sector is derived from the production of legitimate goods and services, it is still considered an illegal economy because most activities are not recorded in national account. It is a challenging task for economists to measure the size of the shadow economy (Bashlakova & Bashlakov, 2021). The measurement to estimate the size of shadow economy can be categorized into direct, indirect, and model-based techniques (Schneider & Buehn, 2018).

A high degree of the shadow economy has caused many issues foe societies and governments in several ways (Özgür et al., 2021). First, it makes erosion in tax revenue that is important for providing public goods, developing infrastructure (Elgin & Erturk, 2019). Second, a larger shadow economy tends to be linked with lower productivity, slower human capital accumulation (Docquier et al., 2017), lack economies of scales (Loayza, 2018).

Political instability has been exanimated in some studies as a variable to investigate the determinants of fiscal deficits. Larger deficits are correlated with political factors (Roubini & Sachs, 1989). Similarly, Cukierman et al. (1992a) argue that more unstable or polarized political systems are more prone to scenarios where the revenue collection capabilities of authorities are constrained deliberately by inefficient tax system. Campillo & Miron (1997) found a positive relationship between political instability and higher inflation. The revenue of government is used more frequently in political unstable societies than it is stable and homogenous countries because given tax evasion or high collection costs (Cukierman et al., 1992b)

Furthermore, the presence of a larger shadow economy can be inflationary due to the inducement to use inflation tax to meet the budgetary requirements when large sections of the economy are unrecorded and thus untaxed (Canzoneri & Rogerss, 1991; Goel & Nelson, 2016). To raise its income, the government will create money which makes appear the inflationary tax or seignorage. As a result, the price level will increase and each holder of the currency pays the tax in the form of a decrease in the buying power of the currency (Phelps, 1973; Sargent & Wallace, 1981). Koreshkova (2006) and Ergene (2015) adopted similar arguments in the case of a system of tax evasion and insufficient tax collection. A positive relationship between the size of shadow economy and inflation rate is confirmed in the study of Mazhar & Meon (2017).

The existing literature mentioned above denotes that the inflation rate effect of political stability is determined by the size of shadow economy of the country. Hence, it is interesting to empirically test the nature of the relationship among these variables of interest.

2. RESEARCH METHODOLOGY AND DATA

2.1 Research model

This paper explores the impact of political stability, shadow economy on the inflation rate. We will also investigate whether the impact of political stability on inflation rate fluctuates at the different size of shadow economy. The DOLS and FMOLS estimator are employed on a sample of 8 ASEAN countries from 2000 to 2017. The following general equation is used:

$$INF_{it} = \beta_0 + \beta_1 PS_{it} + \beta_2 SE_{it} + \beta_3 PS_{it} {}^* SE_{it} + \beta_4 X_{it} + \varepsilon_{it} \quad (1)$$

in which i and t represents a country and time, respectively. INF stands for inflation rate. POL denotes political stability; SE represents shadow economy. SE*POL represents the interaction term between political stability and shadow economy. The intuition behind including an interaction term is that the impact of political stability on inflation rate varies with the levels of shadow economy. By making a partial derivative of Equation (1) with respect of political stability, we get the total impact of political stability on inflation in the existence of the shadow economy, as below:

$$\frac{\partial(INF_{it})}{\partial(PS_{it})} = \beta_1 + \beta_3 SE_{it} \quad (2)$$

As the control variables (X), the study employs economic growth (GDP per capita), trade openness (TO), unemployment (UE). GDP per capita is measured on a logarithmic scale.

2.2 Data source

This study analyzes ASEAN-8 countries including Brunei Darussalam, Cambodia, Malaysia, Indonesia, the Philippines, Singapore, Thailand and Vietnam from 2000 to 2017. All the data were sourced from the World Development Indicators of the World Bank, except the data on the size of shadow economy is collected from Medina & Schneider (2019). These estimates are derived using MIMIC methodology which is considered superior to other methods used to estimate the size of shadow economy. Table 1 summarizes the measurement of the variables used in this paper.

Table 1. Measurements of variables and data sources

Variables	Abbreviation	Measurement	Data source
Dependent variable			
Inflation	INF	Inflation, consumer prices (annual %)	WDI
Independent variables			
Shadow economy	SE	Shadow economy (per cent of GDP)	Medina and Schneider (2019)
Political stability	PS	Political stability index (ranges from -	WGI

			2.5 (high political instability) to 2.5 (greater political stability and lack of violence)	
Control variables				
Economic growth	LGDPP		Natural logarithm of GDP per capita (constant 2010 US$)	WDI
Trade openness	TR		Trade (per cent of GDP)	WDI
Bank credit	CE		Domestic credit provided by the banking sector (per cent of GDP)	WDI

Table 2 presents the descriptive statistics of data for this study. The highest, lowest values of inflation are 24.9 per cent and -2.3 per cent respectively, the mean value is 0.035. The size of shadow economy ranges from 9.4 per cent of GDP to 54.6 per cent of GDP during the period of research and across countries in the sample. The mean value of political stability, proxied by the PS, is -0.075 with a standard deviation of 0.977, a minimum of -2.094, and a maximum of 1.615.

Table 2. Descriptive statistics of the full sample

Variables	*Observations*	*Mean*	*Min.*	*Max.*	*Std. Dev.*
SE	144	0.302	0.094	0.546	0.130
CE	144	0.668	0.059	1.307	0.386
TR	144	1.461	0.374	4.373	0.948
LGDPP	144	8.506	6.06	10.96	1.417
INF	144	0.035	-0.023	0.249	0.041
PS	144	-0.075	-2.094	1.615	0.977
PS*SE	144	-0.090	-0.721	0.413	0.299

SE: Shadow economy; **CE:** Bank credit; **TR:** trade openness; **LGDPP:** economy growth; **INF:** Inflation; **PS:** Political stability **PS*SE:** interaction variable between political stability and shadow economy

3. RESULTS

3.1 Cross-sectional dependence test

Cross-sectional dependence often happens in panel estimation. When cross-sectional dependencies in regression are omitted, the estimation may cause loss of the efficiency and invalid test statistics. We utilize the Pesaran CD (2021) test to examine the presence of cross-sectional dependence. Table 3 shows the results of the test. At the 1 per cent significance level, the hypothesis of cross-sectional dependence cannot be accepted. This finding indicates that the panel unit root test is more reliable when the first difference of variables is used in the analysis.

Table 3. Cross-section dependence test results

Variables	*SE*	*CE*	*TR*	*LGDPP*	*INF*	*PS*	*PS*SE*
CD test	16.159***	9.145***	2.801***	12.192***	10.992***	11.415***	11.154***
p-value	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Notes: *** *significance at 1% level.*

SE: Shadow economy; **CE:** Bank credit; **TR:** trade openness; **LGDPP:** economy growth; **INF:** Inflation; **PS:** Political stability **PS*SE:** interaction variable between political stability and shadow economy

3.2 Panel unit root test

Next, we conduct the unit-root tests proposed by Pesaran (2007) to examine the stationarity and determine the integration order of the variables used in this paper. The empirical results reported in Table 5 reveal that all the variables have a unit root at level. However, all variables used in our analysis become stationary when the first differences are considered. Overall, our results suggest that the variables employed are integrated at I(1). A long-run equilibrium relationship between the variables may be present.

Table 4. Panel unit root test results

Variables	Level		First Difference		Order of Integration
	Constant (1)	Constant and Trend (2)	Constant (3)	Constant and Trend (4)	
SE	0.622 (0.733)	1.596 (0.945)	-1.797** (0.036)	-6.128*** (0.000)	I (1)
CE	0.374 (0.646)	2.012 (0.978)	-0.308* (0.079)	-3.256*** (0.001)	I (1)
TR	1.545 (0.939)	2.345 (0.990)	2.204*** (0.006)	-2.971*** (0.001)	I (1)
LGDPP	1.265 (0.897)	2.379 (0.991)	1.265*** (0.007)	-2.572*** (0.005)	I (1)
INF	-3.330 (0.760)	-3.032 (0.247)	-3.300*** (0.000)	-4.351*** (0.000)	I (1)
PS	-2.478 (0.327)	-2.830 (0.233)	-2.478*** (0.000)	-4.096*** (0.000)	I (1)
PS*SE	-2.950 (0.221)	-2.561 (0.133)	-2.950*** (0.002)	-4.862*** (0.000)	I (1)

Notes: **, *** significant at 5% and 1% level, respectively. The p-values are shown in parentheses. The Z[t-bar] is reported. **SE:** Shadow economy; **CE:** Bank credit; **TR:** trade openness; **LGDPP:** economy growth; **INF:** Inflation; **PS:** Political stability **PS*SE:** interaction variable between political stability and shadow economy

3.3 Panel cointegration test

This study employs various panel cointegration tests developed by Pedroni's (1999, 2004), Kao's (1999), and Westerlund (2005) to examine the existence of a long-run equilibrium relationship between the variables. Table 5 shows the results from these tests. Our results confirm that the null hypothesis of no cointegration cannot be accepted at the 5 per cent significance level. These findings imply a long-run nexus between variables.

Table 5. Results of the cointegration test

	Statistics
Pedroni	
Modified Phillips-Perron t	3.3790***
Phillips-Perron t	-2.8675**
Augmented Dickey-Fuller t	-1.1921**
Kao	
Modified Dickey-Fuller t	-11.124***
Dickey-Fuller t	-7.2673***

Augmented Dickey-Fuller t	-5.6518***
Unadjusted modified Dickey-Fuller t	-10.9813***
Unadjusted Dickey-Fuller t	-7.2537***
Westerlund	
Variance Ratio	2.1992**

Notes: **, *** significant at 5% and 1% level, respectively

3.4 Empirical findings using the dynamic ordinary least squares (DOLS) and fully modified ordinary least squares (FMOLS)

In this section, we employ the panel DOLS estimator suggested by Kao & Chiang (2000) and the panel FMOLS estimator developed by Phillips & Hansen (1990) to examine the relationship between shadow economy, political stability and inflation. The results in Table 6 indicate that the size of shadow economy impact positively and significantly on the level of inflation. However, the more political stability leads to the lower level of inflation. In addition, our findings also indicate that an increase in economic growth and trade openness will lead to a smaller inflation rate. In contrast, an increase in bank credit appears to link with the ASEAN countries' higher level of inflation.

Most interestingly, the coefficients of political stability and the interaction between political stability and shadow economy carry the different signs. This means the impact of political stability on inflation rate really depends on the size of the shadow economy. This is the main contribution of this study. The total effect of political stability on the inflation with the shadow economy is the sum of the estimated coefficients β_1 and β_3, as shown in equation (2).

Table 6. The effect of political stability, shadow economy on inflation using DOLS, FMOLS method

	DOLS	FMOLS
SE	0.061***	0.077***
CE	0.155***	0.225***
TR	-0.135***	-0.214***
LGDPP	-0.216**	-0.627***
PS	-1.601*	-1.551*
PS*SE	0.329**	0.368***

Notes: *, **, *** significant at 10%, 5% and 1% level, respectively.

SE: Shadow economy; CE: Bank credit; TR: trade openness; LGDPP: economy growth; INF: Inflation; PS: Political stability PS*SE: interaction variable between political stability and shadow economy

CONCLUSION

ASEAN countries have a large shadow economy and high level of inflation. Taking 8 ASESAN countries as a case study and relying on a balanced panel data set over the period 2000 to 2017, this study empirically investigates the nexus between political stability, shadow economy and inflation. It additionally examines the moderating role of shadow economy in the political stability and inflation relationship by using DOLS, FMOLS method. The results indicate that shadow economy and bank credit positively contribute to the increase in the inflation rate. Meanwhile, trade openness, economic growth, and political stability reduce the level of inflation in 8 countries during the study period. The novel contribution of the study is the finding that inflation is determined not only by the shadow economy and political stability independently, but that there is an interaction effect between the two variables.

From the experimental results, the author suggests some policy implications as follows. Firstly, shadow economy contributes to an increase in inflation. Thus, the governments of the Southeast Asian

countries should formulate and implement policies to control the size of the shadow economy. These policies will also play an essential role in reducing the inflation rate in the long term. Secondly, political stability has a negative impact on the inflation. The political environment must meet the condition of stability which assures job creation, higher state revenues, poverty reduction, increased welfare and education level. All these mentioned achievements will bring benefits to all citizens of any country; therefore the probability of violence will significantly decrease. Thirdly, policies related to promoting trade, and increasing trade openness should also be planned to control the inflation.

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