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Unemployment and Shadow Economy in ASEAN Countries

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Abstract

The purpose of this study is to investigate the relationship between unemployment and shadow economy for 7 selected ASEAN countries using panel data from 2000–2017. This study uses a sample of 7 ASEAN countries including Cambodia, Indonesia, Malaysia, the Philippines, Singapore, Thailand, and Vietnam covering the 2000–2017 period. The stationarity of the variables is determined by Pesaran panel unit-root tests. The Westerlund panel co-integration technique is used to examine the long-run relationship among the variables. In addition, dynamic ordinary least squares (DOLS) and fully modified ordinary least squares (FMOLS) methods are also employed. The DOLS and FMOLS results indicate that unemployment acts as an important driver for the increase in the shadow economy. In addition, the study results also reveal that GDP per capita has a negative impact on the shadow economy. Moreover, government expenditure, bank credit, and inflation are positively related to the shadow economy. The empirical results indicate that the size of the shadow economy is boosted by unemployment in the selected ASEAN economies. In addition, it is also evident that an increase of GDP per capita in the sample countries results in a lower shadow economy. Besides, government expenditure, bank credit, and inflation play a crucial role in the shadow economy.

Keywords: Unemployment, Shadow Economy, FMOLS, DOLS, ASEAN

JEL Classification Code: O31, O32, D78, Q47, Q53

1. Introduction

Shadow economy plays a crucial role in many aspects of the economy of a country (Dell'Anno & Solomon, 2008). Besides, Blanton and Peksen (2019) stated that shadow economics is ultimately problematic for both policymakers and citizens. Reduced tax revenues, lack of social protection, and lack of access to finance are the effects of the shadow economy. Smith (1985) defines the shadow economy as economic activities and all transactions that evade government regulations and do not comply with tax regulations.

Various studies have been conducted to examine the factors influencing the shadow economy, such as tax burden and the size of the government (Dell'Anno et al., 2007; Webb et al., 2013); the quality of public institutions (Buehn & Schneider, 2012; Luong et al., 2020; Nguyen & Duong, 2021); self-employment (Hassan & Schneider, 2016); and foreign direct investment (Ngoc, 2020).

With more than six hundred million inhabitants, the Association of Southeast Asian Nations (ASEAN) is larger than the European Union in terms of population. The gross domestic product (GDP) is close to 3 trillion dollars. According to Medina and Schneider (2019), the long-term average growth of the shadow economy in ASEAN since the early 1990s has been generally recorded at a high level. Specifically, in the period 1991–2015, the activity of the shadow economy reached 33.4% of regional GDP. This figure is much higher than the average of 21.2% of the 3 countries including China, Korea, and Japan combined, and higher than the global average of 31.9%. While the growth of the ASEAN economic community will certainly go hand in hand with deeper economic integration in the region, this could also increase the ability of the shadow economy to operate across borders. The current COVID-19 epidemic is clearly the most pressing issue. Lockdowns and other precautions have brought economic activity to a standstill in the region, and many self-employed individuals and micro businesses have been the hardest hit. The informal sector has become a trend that people go to for survival. Hence, the purpose of this study is to examine the impact of unemployment on the shadow economy in these countries.

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Compared to previous studies, this study contributes to the shadow economy literature in two respects. The relationship between unemployment and shadow economy is first examined in the context of ASEAN economies. In addition, dynamic ordinary least squares (DOLS) and fully modified ordinary least squares (FMOLS) methods are used to examine the long-run relationship based on panel data.

2. Literature Review

2.1. Shadow Economy

Hart (1971) defineD the shadow economy as the informal economy. The shadow economy takes place within the framework of the illegal or black market (Bajada & Schneider, 2018). Smith (1985) described a shadow economy as a market-based production of goods and services, whether legal or illegal, that is not identified in official estimates of GDP. In addition, Oduh et al. (2008) defined the shadow economy as an informal economy that operates without regulations set forth by public authorities to govern its organizational behavior. Abada et al. (2021) showed that the shadow economy operates in an environment where there is no regulation by public authorities. In addition, Dell'Anno and Solomon (2008) argued that the larger the difference between the labor cost in the formal economy and the higher the tax burden, the larger the labor supply in the informal sector will be. Maloney (2004) argued that firms and employees leave the formal sector to maximize utility, considering the full package of benefits and opportunities offered by different jobs in formal and informal economies. In addition, Williams and Horodnic (2015) also argued that it may be the case that state intervention in the informal economy may leave workers less protected. As a result, they continue to depend on the informal economy. Reducing working hours or retiring early motivates employees to spend time working in the informal sector (Lemiaux et al., 1994). Besides, Schneider and Williams (2013) also showed that the higher the number of self-employed workers, the greater the activity in the underground economy. Marwa and Chokri (2019) stated that an increase in corruption will increase the size of the informal economy. In addition, corruption has a positive impact on the shadow economy but negatively affects the official economy (Johnson et al., 1997). Similarly, Buehn and Schneider (2009) also asserted a positive association between corruption and the shadow economy.

2.2. The Relationship Between Unemployment and Shadow Economy

Various studies have been conducted to examine the factors influencing the shadow economy, such as tax burden and the size of the government (Dell'Anno et al., 2007; Webb et al., 2013); the quality of public institutions (Buehn & Schneider, 2012); and self-employment (Hassan & Schneider, 2016). Besides, studies on the unemployment rate and shadow economy are also found in developed countries. Davidescu (2014) examined the impact of the unemployment rate on the shadow economy in Romania from 2000 to 2013 by using the ARDL and SVAR techniques. The results indicated that, in long run, there was no association between unemployment and the shadow economy in Romania. However, in the short run, the results reveal that an increase in the unemployment rate led to a rise in the shadow economy. In addition, a causal relationship between the unemployment rate and shadow economy in the US is also confirmed in Davidescu and Dobre (2012). Besides, Dobre and Alexandru (2009) also explored the impact of the unemployment rate on Spain's shadow economy from 1970 to 2007. They found that the unemployment rate has a positive impact on the shadow economy. In addition, the provisions of labor law, if not providing comprehensive coverage of specific regulations and benefits, can also affect the migration of workers to the informal economy (Blanton & Peksen, 2019). Schneider (2010) examined the impact of unemployment and the shadow economy by using data of 162 countries from 1999 to 2007. The results revealed that there is no significant relationship between unemployment and the shadow economy. This is because of rising unemployment due to poorly regulated labor markets, which significantly increases the size and propensity of shadow economies. Meanwhile, the underground economy's revenue ensures the subsistence of families in less developed economies. Thus, the informal sector plays an important role in providing food in developing countries. In addition, Saafi et al. (2015) employed a comparative study of 32 developing and developed countries from 1980 to 2009. They used nonparametric and parametric methods to explore the link between unemployment and shadow economy in these countries. The results confirmed a bidirectional relationship between unemployment rates and shadow economy and vice versa.

3. Data and Research Methodology

3.1. Data

This study utilizes a sample of 7 ASEAN countries including Cambodia, Indonesia, Malaysia, the Philippines, Singapore, Thailand, and Vietnam covering the 2000–2017 period. Table 1 shows a brief of the relevant data sources and measurement of the variables utilized in this study.

Table 1: Description of Variables and Measurement

No	Variables	Measurement	Abbreviation	Source
Dependent Variable				
1	Shadow economy	Shadow economy (percent of GDP)	SE	Medina and Schneider (2019)
Independent Variables				
2	Unemployment	Unemployment, total (percent of the total labor force)	UE	WDI
Control Variables				
3	Economic growth	Logarithm of GDP per capita (constant 2010 US)	LGDP	WDI
4	Broad money supply	Broad money supply (percent of GDP)	BR	WDI
5	Trade openness	Trade (percent of GDP)	TR	WDI
6	Bank credit	Domestic credit provided by the banking sector (percent of GDP)	CE	WDI
7	Government expenditure	General government final consumption expenditure (percent of GDP)	GE	WDI
8	Inflation	The inflation rate, consumer prices	INF	WDI

3.2. Research Methodology

This study uses panel data over the period 2000–2017 for 7 selected ASEAN economies. The study utilizes the following regression model:

$$\mathrm{SE}_{it} = \beta_0 + \beta_1 \mathrm{UE}_{it} + \beta_2 \mathrm{LGDP}_{it} + \beta_3 \mathrm{BR}_{it} + \beta_4 \mathrm{TR}_{it} + \beta_5 \mathrm{CE}_{it} + \beta_6 \mathrm{GE}_{it} + \beta_7 \mathrm{INF}_{it} + \varepsilon_{it}$$

where i and t denote a country and time, respectively. SE indicates shadow economy size. UE denotes unemployment. In addition, this study utilizes six control variables, including economic growth (logarithm GDP per capita - LGDP), broad money supply (BR), trade openness (TR), bank credit (CE), government expenditure (GE), and inflation (INF).

The descriptive statistics of all variables are summarized in Table 2. The average of the shadow economy and unemployment is 0.306 and 0.032, respectively. On the other hand, the average of GDP per capita, broad money supply, trade openness, bank credit, government expenditure, and inflation is equal to 8.225, 0.862, 1.526, 0.705, 0.096, and 0.040, respectively.

4. Empirical Results and Discussion

4.1. Panel Unit Root Test

This study employs the panel unit-root test introduced by Pesaran (2003) to explore the stationarity of the concerned variables. According to the results shown in Table 3, the null hypothesis of unit root is strongly rejected at a 1 percent level of significance for all variables at their first difference.

4.2. Panel Co-Integration Test

In addition, this study also examined the panel co-integration test of Westerlund (2005). The result of the co-integration test in Table 4 is also rejected at the 1 percent significance level. In other words, shadow economy, unemployment, and other control variables move together in the long run.

4.3. Empirical Findings

Finally, the DOLS method proposed by Kao and Chiang (2000) and FMOLS method suggested by Phillips and Hansen (1990), were used to explore the relationship between unemployment and shadow economy. Table 5 reports the two types of results: DOLS and FMOLS. In the DOLS model, unemployment, bank credit, and government expenditure are positively related to the shadow economy, whereas GDP per capita has a negative impact on the shadow economy. In the FMOLS estimation, unemployment, government expenditure, and inflation have a positive effect on the shadow economy. In addition, the results in FMOLS also confirm that GDP per capita is negatively related to the shadow economy. In other words, unemployment has a positive effect on the shadow economy of selected ASEAN

Table 2: Descriptive Statistics

	Observations	Mean	Min	Max	Std. Dev.
SE	126	0.306	0.094	0.546	0.138
SE	119	−0.003	−0.089	0.083	0.016
UE	126	0.032	0.001	0.111	0.020
UE	119	−0.001	−0.074	0.054	0.011
LGDPP	126	8.225	6.060	10.960	1.289
LGDPP	119	0.039	−0.037	0.117	0.024
BR	126	0.862	0.129	1.552	0.391
BR	119	0.018	−0.150	0.213	0.060
TR	126	1.526	0.374	4.373	0.997
TR	119	−0.006	−0.791	0.430	0.128
CE	126	0.705	0.059	1.307	0.398
CE	119	0.018	−0.129	0.204	0.059
GE	126	0.096	0.034	0.171	0.032
GE	119	0.001	−0.011	0.022	0.005
INF	126	0.040	−0.017	0.249	0.040
INF	119	0.001	−0.256	0.173	0.044

Notes: SE: Shadow economy; UE: Unemployment; LGDP: GDP per capita; BR: Broad money supply; TR: Trade openness; CE: Bank credit; GE: Government expenditure; INF: Inflation.

Table 3: Panel Unit Root Test Results

Variables	Level	First Difference	Order of Integration
SE	1.899	−2.604***	I(1)
UE	0.314	−3.196***	I(1)
LGDP	1.166	−3.146***	I(1)
BR	1.513	−6.666***	I(1)
TR	2.190	−1.526*	I(1)
CE	−0.086	−4.669***	I(1)
GE	−0.961	−2.384***	I(1)
INF	−0.501	−4.398***	I(1)

Notes: *, **, ****Significant at 10%, 5% and 1% level, respectively. The Z[t-bar] is shown.*
SE: Shadow economy; UE: Unemployment; LGDP: GDP per capita; BR: Broad money supply; TR: Trade openness; CE: Bank credit; GE: Government expenditure; INF: Inflation.

economies. Besides, the larger the GDP per capita in the sample countries, the lower is the shadow economy in these countries. Moreover, an increase in government expenditure will boost the shadow economy.

5. Conclusion

The main objective of this study is to empirically examine whether unemployment affects the shadow economy in 7 selected ASEAN countries by using panel data over the period 2000–2017. To achieve both objectives, this study employs panel unit-root test, panel co-integration, DOLS, and FMOLS techniques. The empirical results indicate that the size of the shadow economy is boosted by unemployment in the selected ASEAN economies. In addition, it is also evident that an increase of GDP per capita in the sample countries results in a lower shadow economy. Besides, government expenditure, bank credit, and inflation play a crucial role in the shadow economy.

Table 4: Results of the Cointegration Test

	Statistics
Variance Ratio	2.873***

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

Table 5: DOLS and FMOLS Results

	DOLS	FMOLS
UE	0.717**	0.532***
LGDP	−0.293***	−0.185***
BR	−0.046	−0.011
TR	−0.031	0.002
CE	0.141**	0.005
GE	0.795***	0.922***
INF	0.042	0.094***

Notes: *, **, ***Significant at 10%, 5% and 1% level, respectively.
SE: Shadow economy; UE: Unemployment; LGDP: GDP per capita; BR: Broad money supply; TR: Trade openness; CE: Bank credit; GE: Government expenditure; INF: Inflation.

Based on the empirical findings, the study suggests two policy implications which involve unemployment and linking solutions to contribute to control shadow economy in ASEAN: the results in this study confirm that unemployment boost shadow economy. This suggests that managers should pay more attention to policies aimed at reducing unemployment to limit the size of the shadow economy. In addition, job creation will contribute to an increase in GDP per capita, which in turn reduces the size of the underground economy.

From the results of this study, several directions for further research are proposed. First, the study is limited to 7 countries in the ASEAN region. Expanding and comparing differences with developed countries in other regions will contribute significantly to the shadow economy literature. Second, future research may examine the effectiveness of macro policies related to unemployment or tax policy to influence the size of the shadow economy.

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