

# Any Link between Unofficial Economy and Official Economy? An Empirical Evidence from the ASEAN

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## Abstract

This purpose of this study is to examine a possible link between unofficial economy and official economy for the ASEAN from 1996 to 2013. The unofficial economy is technically unobservable. As such, the MIMIC approach, which will estimate the unobservable variable using different observable variables, is utilized in this study. The findings from this study indicate that when the official economy is proxied by the GDP or the GDP per capita, the unofficial economy negatively contributes to the official economy. The effect from the unofficial economy to the official economy is more significant to the GDP than to the GDP per capita. We argue that it may be the time to move away from the conventional approach adopted by the governments in the ASEAN in controlling the unofficial economy in the forms of punishment and education. A more appropriate approach to control a growth of the unofficial economy is to adopt a more comprehensive and systematic review of tax and social security contributions burdens; regulations and others which are well evidenced and documented in the literature of the shadow economy.

**Keywords:** unofficial economy, official economy, MIMIC approach, ASEAN

## 1. The Introduction

The unofficial economy, also known as shadow economy; the hidden economy or the black economy, is a global issue (Schneider & Enste, 2000). In this study, these terminologies will be used interchangeably. The presence of the unofficial economy is considered obvious in any country regardless of its phase of economic development and political regime. The unofficial economy is known to be in existence together with the official economy and there is an interaction between the two. Some empirical studies concluded that a reduction in the official economy may be associated with an increase in the shadow economy and vice versa (IBRE-FGV/ETCO Institute, 2008). As a result, it is argued that protecting an official economy would mean penalizing the unofficial economy. Countries all over the world have consistently put effort to control the growth of the shadow economy with the expectation that the official economy will benefit. Some typical measures to control a shadow economy are to apply penalty and education to businesses and individuals (Bajada & Schneider, 2003).

Various empirical studies have provided a very similar conclusion in terms of the shadow economy for countries all over the world. Developing countries and countries in transition have generally experienced a larger shadow economy in comparison with the developed nations. For example, the recent estimate of Vo and Ly (2014) presented that the size of the shadow economy in the ASEAN varies within a range of 20 per cent and 50 per cent of the official economy. Previous estimates provided the same outcome. Phan (2012) concluded that the shadow economy of China and Vietnam varies with the range of 30 per cent and 45 per cent of the official economy represented by the value of the GDP. However, for the ASEAN, a link between the shadow economy and the official economy has not been empirically established, particular for a recent period after the Asian financial crisis in 1997.

This study has been attempted to provide an empirical evidence in relation to the possible link between the shadow economy and the official economy in the period from 1997 to 2012 using a widely used approach, known as the MIMIC approach, in estimating the shadow economy. Following this Introduction, Section 2

provides a brief discussion on a shadow economy. A relationship between a shadow economy and an official economy in the previous empirical studies is examined in Section 3. Section 4 provides brief discussion of the MIMIC approach, the data, research model and findings from this study. Concluding remarks and policy implications are presented in Section 5.

## 2. A Brief Discussion on the Unofficial Economy

A definition of an unofficial economy is far from completion. Various studies have adopted different definitions of an unofficial economy. Researchers may have not adopted the same definition of an unofficial economy. However, most definitions of an unofficial economy have generally agreed on a typical aspect of an unofficial economy – the sector covering economic activities which are generally not recorded in the national economic activities.

Greenidge et al. (2009) considered that any economic activity which are not recorded in the national statistics is considered operating in the unofficial economy. Feige (1979, 1990) argued that unofficial economy includes activities which are not reported and unable to be measured directly. Ihrig and Moe (2004) were of the view that an unofficial economy may include a legal production industry but this industry is not appropriate to be in existence in the economy or with the government's regulations. In addition, Frey and Pommerehne (1984); Loayza (1996); Johnson, Kaufmann and Shleifer (1997); Johnson, Kaufmann và Zoido-Lobaton (1998, 1999); Thomas (1999); Fleming (2000); Schneider and Enste (2000, 2002); Dell'Anno and Schneider (2003); Schneider (2005, 2006, 2007, 2010, 2012, 2013) and many other studies have also adopted a very similar definition of the unofficial economy. Table 1 below classifies activities in an unofficial economy.

Table 1. A classification of activities in the unofficial economy

ILLEGAL ACTIVITIES	Monetary Transactions		Non-monetary Transactions	
	Trade in stolen goods; drug dealing and manufacturing; prostitution; gambling; smuggling; fraud.			Barter of drugs, stolen, smuggled goods, etc. Producing or growing drugs for own use. Theft for own use.
LEGAL ACTIVITIES	Tax Evasion	Tax Avoidance	Tax Evasion	Tax Evasion
	Unreported income from self-employment; wages, salaries, and assets from unreported work related to legal services and goods.	Employee discounts, fringe benefits.	Barter of legal services and goods.	All do-it-yourself work and neighbor help.

Source: Rolf Mirus và Roger S. Smith (1997, p. 5).

In this study, a unofficial economy is defined as a sector covering a complete market of goods production and services provision but they are hidden from the government for the following reasons: (i) to evade tax (such as income tax; value-added tax); (ii) to avoid social security contribution; (iii) to avoid a minimum requirement in the labour market such as a minimum wage, a maximum number of hours working, safety requirements; and (iv) to avoid the administrative requirements from various departments in the economy.

## 3. A Relationship between Unofficial Economy and Official Economy

Many empirical studies have been attempted to examine the relationship between unofficial economy and an official economy (proxied by the gross domestic output (GDP) or gross national income (GNI)) for developed countries. However, studies aiming at developing nations and countries in transition are limited, in particular for the ASEAN.

Table 2. Key findings from previous studies

	Author(s)	Country	Key findings
A positive relationship	Adam and Ginsburgh (1985)	Belgium	a positive relationship between the growth of the shadow economy and the "official" one)
	Tedds (1998), Tedds (2005), Giles and Tedds (2002)	Canada	a positive relationship between GDP and the underground economy
	Giles (1999)	New Zealand	Shadow economy and official economy are positively correlated

Author(s)	Country	Key findings
Schneider (1999)	Germany and Austria	More than 60% of income earned from the shadow sector is spent in the official economy. The shadow economy provides opportunity for the official economy to grow.
Chatterjee, Chaudhuri, Schneider (2003)	18 Asian countries	An increase in shadow economy positively contributes to an official economy.
Schneider and Bajada (2003)	Canada	There exists a positive relationship between GDP and the underground economy
Fichtenbaum (1989)	United States	An increase in a shadow economy had negatively contributed to the official economy for the period from 1970–1989
Dilip K. Bhattacharyya (1993, 1999)	United Kingdom (1960–84)	Hidden economy has a positive effect on consumer expenditures of nondurable goods and services, and an even stronger positive effect on consumer expenditures on durable goods and services
Loyaza (1996)	14 Latin American countries	A 1% increase in a shadow economy is associated with a 1.22% reduction in the official economy proxied by GDP per capita.
Kaufmann, Kaliberda (1996)	Countries in transition	The authors concluded that for every 10% reduction in the official economy, the unofficial economy will increase by 4%.
Eilat, Zinnes (2000)	24 countries in transition	a one-dollar fall in GDP is associated with a 31-cent increase in the size of the shadow economy.
Schneider, Enste (2000)	76 countries	A negative relationship between shadow economy and official economy
Anno (2003)	Italy	A shadow economy is negatively correlated with the official economy
Schneider, F., & Klinglmair, R. (2004)	110 countries	If the shadow economy increases by 1%, the annual growth rate of the “official” GDP decreases by 0.6%
Dobre, I., & Alexandru, A. (2009)	Spain	A negative relationship between a growth rate of an official economy and that of an unofficial economy
Schneider (2013)	39 OECD countries	A negative contribution from the shadow economy to the official economy

Source: Compiled by the authors.

Brief findings from previous empirical studies are summarized in Table 2 above. The findings from available studies on a relationship between unofficial economy and official economy are mixed. Some studies concluded that unofficial economy and official economy are positively correlated. It means that an increase in the official economy is generally associated with an increase in the unofficial economy and vice versa. However, findings from other studies also indicate that unofficial economy and official economy are substitute – an increase in an official economy will be associated with a reduction in unofficial economy. All these studies were conducted for different countries or groups of countries, at different period of time. And they only focused on one dimension of the relationship. This means that whether or not there is a causal relationship between an unofficial economy and an official economy is still outstanding, particular for the ASEAN. However, it is noted that all these studies adopted a similar approach – a widely used approach of the MIMIC.

#### 4. A Research Approach, Model, and Data

##### 4.1 A Research Approach

A shadow economy is unobservable. As such, it cannot be directly measured. A MIMIC approach is used in this study to measure the unofficial economy of the ASEAN countries. Previous empirical studies which had also used MIMIC to estimate the unofficial economy such as those conducted by Giles and Tedds (2002); Bajada and Schneider (2005); Anno and Schneider (2003) play significant role for this study in which causes variables and indicators variables are selected.

The MIMIC approach was arguably first developed by Zellner (1970) and Goldberger (1972) in their studies at the very early stage in which unobservable (latent) variable was included. The MIMIC approach was developed on the ground of the structural equation model (SEM) which includes two groups of variables: (i) A group of causes and indicators variables which can be directly observed and (ii) a group of latent (unobservable) variables which cannot be directly measured or observed. The MIMIC approach used to estimate the unofficial economy

linking the unobservable variable (unofficial economy) and sets of observable variables including causes and indicators variables can be presented below.

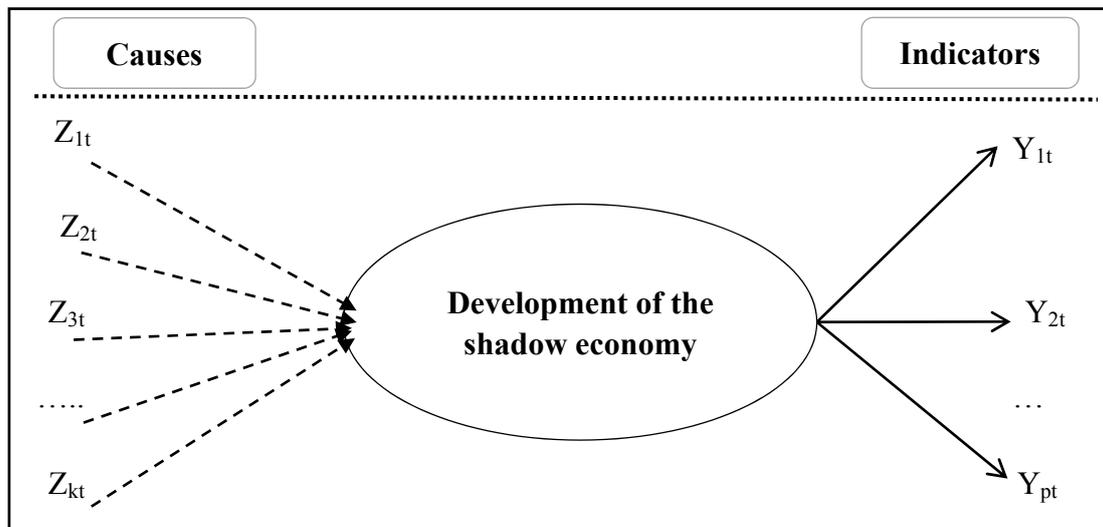


Figure 1. A general framework for the MIMIC approach adopted in this study

Source: Buehn & Schneider (2013, p.19).

The MIMIC approach is widely used to measure the trend of the unofficial economy for countries all over the world. The key strength of this approach is to take into account various factors which may contribute to the presence and growth of the unofficial economy over time, in particular for the markets for production, labour and money. A fundamental feature of the MIMIC approach is to establish and test a relationship between an unobservable variable with a set of observable variables using the variance matrix.

In the MIMIC approach in this study, an unofficial economy is an unobservable variable which will be examined based on a set of observable variables. For this purpose, a variable representing for an unofficial economy is first linked to observable variables in the factors analysis model, also known as a *measurement model*. After that, a relationship between an unofficial economy and explanatory variables (causes) is estimated using a *structural model*. As a result, the MIMIC approach utilizes both measurement model and structural model simultaneously.

Even though MIMIC approach is a very widely used approach which is generally adopted to estimate the shadow economy in empirical studies over the world, the approach faces some criticisms. It is noted that, under the MIMIC approach, the model requires that: (i) indicators variables are conditionally independent from the cause variables; and (ii) indicators variables are mutually independent. It is argued that the criticisms to the MIMIC approach is similar to the other methodologies in estimating the shadow economy. Some criticism to the MIMIC approach are as (Note 1): (1) Giles and Tedds (2002) state that there is no guarantee that the model is capable of precisely reflecting the share of shadow economy because the causes and the indicators may reflect other economic phenomena; (2) MIMIC does not reproduce an estimation that may represent shadow economy as a percentage of GDP, but only an index; and (3) the flexibility provided by the MIMIC approach does not avoid the use of variables that are difficult to measure. The application of the method needs the use of variables that are hard to measure, which may contain errors.

#### 4.2 A Model

On the ground of previously empirical studies and theories on an unofficial economy, the model adopted in this study can be presented in Figure 2 as below. It is noted that the choice of causes variables and indicators variables are extremely difficult and arbitrary. However, it is argued that the choice of these variables in this study is based on considerations of fundamental characteristics of the ASEAN economies. These variables are also supported by theories and empirical studies on shadow economy in the last 30 years or so.

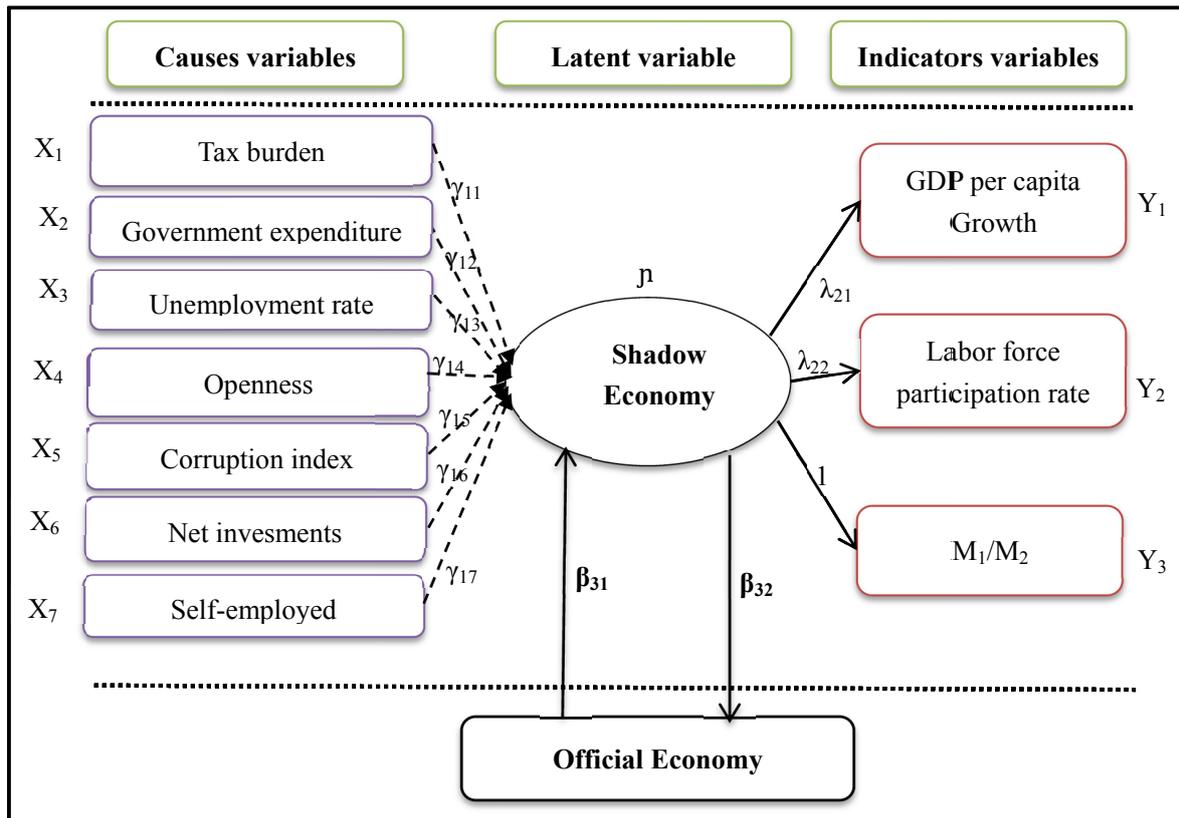


Figure 2. Unofficial economy versus official economy: causes variables and indicators variables

**Causes variables:** causes variables adopted in this empirical study include: (i) *tax burden* (TAX), (ii) *government expenditure* (G), (iii) *unemployment rate* (RUE), (iv) *Openness of the economy* (OEC), (v) *perceived corruption index* (IRU), (vi) *Net investment* (NI), and (vii) *A ratio between self-employed people and total labour force* (MBU). Each of these causes variables is discussed in turn below.

- **A tax burden (TAX):** this is the burden for businesses and individuals joining the official economy. This burden will determine whether or not those businesses and individuals joining the unofficial economy to avoid these burdens. Houston (1987) concluded that the presence of the unofficial economy is closely linked to taxation policies and regulations in the economy. In their study, T Lemieux, B Fortin, P Frechette (1994) provided evidence to conclude that there is a link between labour-based taxation and unofficial economy. As a result, this study adopts a research hypothesis that unofficial economy and a burden of taxation and regulation are positively correlated.
- **Government expenditure (G):** Various studies have been conducted to understand whether or not an increase in total government expenditure and net investment will be associated with an increase in both official economy and unofficial economy. This strong link has been confirmed in various studies including Loyaza (1996), Kaufmann, Kaliberda (1996), Anno (2003). As a result, a research hypothesis is developed on a positive relationship between an unofficial economy and government expenditure and net investment in the economy.
- **An unemployment rate (RUE):** It is argued that a high unemployment rate will cause individuals to join unofficial economy to look for another source of income to secure the living standard of individuals and their families. An increase in an unofficial economy is positively associated with a presence of a high unemployment rate in the economy. This relationship is confirmed in the study conducted by Corina-Maria Ene and Andrei Ștefănescu (2011).
- **The openness of the economy (OEC):** Johnson, Kaufmann and Andrei Shleifer (1997); Johnson, Kaufmann and Zoido-Lobato (1998) found evidence to support the view that there is a positive relationship between the unofficial economy and the openness of the economy. They argued that with a high level of the openness of the economy, it is more and more difficult to manage economic activities happening in the economy. This difficulty has contributed to an increase of the unofficial economy.

- **A perceived corruption index (IRU):** various empirical studies including Johnson, Kaufmann and Andrei Shleifer (1997); Johnson, Kaufmann and Zoido-Lobaton (1998) also concluded that one of the fundamental causes of an unofficial economy is corruption. It is noted that corruption is unobservable. As a result, an index representing for a level of corruption is adopted in this study.
- **Self-employed/ labour force (MBU):** it is argued that labour force has significantly contributed to the presence of the unofficial economy. This conclusion was found from various studies including R Dell'Anno, M Gómez-Antonio, and A Pardo (2007); Corina-Maria Ene and Andrei Ștefănescu (2011).

**Indicators variable:** indicators variables used in this study include: (i) a growth rate of a real GDP per capita (GDP per capita), (ii) a ratio between labour force and total population (L), (iii) a ratio  $M_1/M_2$ .

- **The growth rate of real GDP per capita (GDP per capita)** is estimated as a ratio between total real GDP and total population of the current year. Adam and Ginsburgh (1985); Loayza (1996) concluded that there is a positive relationship between a growth rate of an unofficial economy and that of the official economy. These authors argued that an expansionary fiscal policy adopted by the government does not only contribute to the growth of the official economy but also the growth of an unofficial economy. Schneider (1998) confirmed that 66 per cent of income earned from the unofficial economy are spent within the official economy. As a result, he argued that an unofficial economy provides opportunity for the official economy to grow. Dilip and Bhattacharyya (1993, 1999) provided evidence to support the view that an unofficial economy contributes positively to the official economy via income.
- **A participation rate (L):** This ratio represents the ratio between a labour force and total population. Lemieux, Fortin, and Frechette (1994) confirmed the link between an unofficial economy and labour supply which is distorted by tax and regulation policy in the official economy. Schneider (2003) concluded that an unofficial economy and labour supply exhibits a strong relationship. Based on the findings of these key studies, we argue that *labour supply* is an important indicator variable for the presence of the unofficial economy.
- **A ratio  $M_1/M_2$ :** this represents a ratio between money supply  $M_1$  and  $M_2$  in the economy. A study by Dell'Anno and Schneider (2003) adopted this ratio as an indicator variable. Dell'Anno, Gómez-Antonio, and Pardo (2007) used a ratio of  $M_1/M_3$  in their study of estimating the unofficial economy for France, Greece and Spain. While different indicators representing for money supply is acknowledged, we are of the view that the findings are expected to be similar. As such, this study adopts a ratio  $M_1/M_2$ .

#### 4.3 Data and Descriptive Statistics

This study is conducted on the sample of 8 countries included in the ASEAN, including Vietnam, Thailand, Malaysia, the Philippines, Singapore, Laos, Cambodia, and Indonesia. Myanmar and Brunei are excluded because these two countries do not have sufficient data required for the study. Data utilized in this study covers the period from 1996 to 2013 and collected from various sources. Table 3 presents descriptive statistics of all causes variables and consequences variables

Table 3. Descriptive statistics of causes and indicators variables for unofficial economy and for the official economy

Groups	Variable	Unit	Mean	Median	Max	Min	Std. Dev.
Cause variables	Tax burden	%	13.49	13.27	22.46	5.80	3.62
	Government expenditure	%	9.38	9.38	16.31	3.46	2.93
	Net investment	%	24.45	24.10	43.11	11.61	6.18
	Unemployment rate	%	3.89	2.80	11.85	0.66	2.83
	Openness	%	142.79	113.87	444.10	45.40	100.41
	Corruption index	%	36.35	28.00	94.00	10.00	24.03
Indicators variables	Self employed	%	56.99	62.90	88.30	13.90	24.74
	GDP per capita growth	%	103.72(Note 2)	104.50	113.22	85.61	3.62
	$M_1/M_2$	%	26.84	23.27	87.52	9.29	16.27
Official Economy	Labour force	%	74.61	75.30	84.80	61.90	7.37
	GDP	Billion \$	115.15	103.34	452.33	1.60	98.35
	GDP per capita	\$	5167.76	1228.47	36897.87	268.94	9323.08

Source: Authors' analysis.

## 5. Empirical Results

Research findings are presented in Table 5 below.

Table 4. Regression results

	Model 1	Model 2
<b>Causes variables:</b>		
Tax burden	0.060(2.905)***	0.085(3.69)***
Government expenditure	0.038(2.329)**	0.030(2.08)***
Unemployment rate	-0.080(-3.666)***	-0.088(-3.98)***
Openness	0.277(4.066)***	0.225(3.59)***
Net investment	-0.037(-1.946)*	-0.049(-2.54)***
Self employed	0.540(4.651)***	0.541(4.83)***
Perceived corruption index	0.014(0.331)	0.005(0.12)***
<b>Indicators variables:</b>		
M1/M2	1	1
Labour force	2.484(4.720)***	2.493(3.03)***
GDP per capita growth	0.807(2.980)***	0.812(4.90)***
<b>A relationship between the unofficial economy and the official economy in the ASEAN:</b>		
SE → GDP constant	-0.914(-3.205)***	
GDP constant → SE	-0.014(-1.018)***	
SE → GDP per capita		-2.215(0.611)***
GDP per capita → SE		0.064(0.036)***
<b>Goodness of fit test:</b>		
Observations	144	144
Degree of freedom	20	20
Chi-square	27.079	28.176
Chi-square/df (p_value)	1.354(0.133)	1.409(0.105)
RMSEA (Pclose)	0.050(0.464)	0.053(0.413)
AGFI	0.894	0.891

Note. Statistical values z are in the brackets. \*\*\*, \*\* and \* represent a level of significance at 1%, 5% and 10%.

Values for all variables are standard deviations from the mean. The MIMIC approach requires one of the indicators variable with estimated coefficient to be fixed. The ratio of M1/M2 is selected for consistency with other previous studies. RMSEA (Root Mean Square Error of Approximation). Pclose is a "p value" for testing the null hypothesis that the population RMSEA is no greater than .05. AGFI (adjusted goodness of fit index).

Estimates from Table 5 present that the Chi-square values fall with the range of 26.8 and 28.6 with 20 degree of freedom. As such, the *Chi-square value/df* is smaller than 2 and its p-value is greater than 0.05. This findings confirms the suitability of the model (Carmines & McIver, 1981). In addition, RMSEA is smaller than 0.08 with *Pclose* is greater than 0.05 (Steiger, 1990); and AGFI is greater than 0.8 (Bentler & Bonett, 1980). Based on these estimates, it can be concluded that it is appropriate to use this model with data collected (Hair et al., 2010).

Two models are adopted in this empirical study: (i) *Model 1* in which the official economy is proxied by the GDP; and (ii) *Model 2* in which the official economy is proxied by the GDP per capita. It is argued that these two proxies are adopted to take into account different periods from economic growth to economic development in the ASEAN.

In relation to the causes variables, the following findings are evidenced from this study. *First*, the relationship between six out of 7 causes variables (being *tax burden*; *government expenditure*; *unemployment rate*; *openness of the economy*; *net investment*; and *self-employed*) and the unofficial economy is statistically significant. *Second*, while estimates for other causes variables are as expected, a negative relationship between unemployment rate and the unofficial economy is interesting to explore. This negative relationship means that a reduction of an unemployment rate (i.e. more employment in the official economy) may be associated with an increase of the unofficial economy. This finding can be interpreted in the way that workers prefer to work more hours in the ASEAN. Even though they get work in the official economy, it does not guarantee that they are not interested in taking work in the unofficial sector. This study fails to provide evidence to support the view that *a*

*perceived corruption index* is a cause to the presence of the unofficial economy.

In relation to the indicators variables, this study finds that *labour force participation rate* and *GDP per capita growth* are reliable indicators for the presence and the growth of the unofficial sector in the economy. The findings confirm a positive relationship between the unofficial economy and these indicators variables.

The inter-relationship between the unofficial economy and the official economy in the ASEAN for the period from 1996 to 2013 is now considered. Under both models, the unofficial economy negatively affects the official economy which is proxied by a GDP (Model 1) and GDP per capita (Model 2). The effect of the official economy to the unofficial economy is mixed under the two models: (i) the estimate is positive under Model 1 but this estimate is not statistically significant; and (ii) the estimate is negative under Model 2 and this estimate is only statistically significant at 10 per cent. It is noted that, under both models, the effects from the unofficial economy to the official economy is more significant than the effect from the official economy to the unofficial economy.

## 6. Concluding Remarks and Policy Implications

This study is conducted to examine the possible link between the unofficial economy and the official economy and quantify the effects for the ASEAN for the period from 1996 to 2013. The unofficial economy is a latent (unobservable) variable which can be estimated using other observable variables. The widely used MIMIC approach in estimating the shadow economy is utilized in this study. Key findings from this study can be summarized as below.

- First, both *labour force participation rate* and *GDP per capita growth* are reliable indicators for the presence and growth of the unofficial economy. These indicators variables are positively correlated with the unofficial economy.
- Second, *tax burden; government expenditure; unemployment rate; openness of the economy; net investment; and self-employed* are all likely causes of the presence of the unofficial economy.

In relation to the relationship between the unofficial economy and the official economy, the findings from this study indicate that they are negatively correlated. When the official economy is proxied by the GDP or the GDP per capita, the unofficial economy negatively contributes to the official economy. The effect from the unofficial economy is more significant to the GDP than to the GDP per capita. On the other end, this study finds a weak positive effect from the official economy, which is proxied by GDP per capita, to the unofficial economy. This study fails to confirm an effect to the unofficial economy from the official economy which is proxied by the GDP. Based on these findings, it is concluded that while the negative effect from the unofficial economy to the official economy is clear, the effect from the official economy to the unofficial economy is inconclusive.

The implications for policy from this study are that countries belonging to the ASEAN will enjoy more benefits from the process of economic growth and development when the unofficial economy for each country is at a smaller size than it is now. While specific policy recommendations to control a growth of the unofficial economy are beyond the reach of this paper, the governments of the ASEAN may need to consider fundamental causes which cause the presence and the growth of the unofficial economy. It may be the time to move away from the conventional approach adopted by the governments in controlling the unofficial economy in the forms of punishment and education. A more appropriate approach to control a growth of the unofficial economy is to adopt a more comprehensive and systematic review of tax and social security contributions burdens; regulations and others which are well evidenced and documented in the literature of the shadow economy.

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**Notes**

Note 1. IBRE-FGV / ETCO Institute.

Note 2. Due to a construction of this data, this figure means that the average (mean) value of the GDP per capita growth for all countries in the sample for the period considered is 3.72 per cent per year.

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