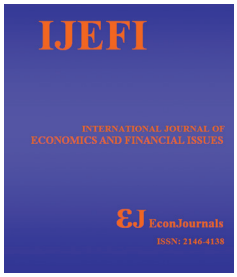

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Shadow Economy and Financial Sector Development in Malaysia

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ABSTRACT

This paper explores the link between the shadow economy and financial sector development in Malaysia for the period 1971-2013. We calculate the size of the shadow economy by using the modified-cash-deposits-ratio approach recently developed by Pickhardt and Sardia (2011). We investigate the contention made by Blackburn et al. (2012) that financial sector development can mitigate shadow economy – higher level of financial sector development lead to lower level of shadow economy. Our results show that there is a non-linear long-run relationship between shadow economy and financial sector development in Malaysia, an inverted-U shape curve, suggesting that at lower (higher) level of financial sector development commensurate with higher (lower) level of the shadow economy. One policy implication from this study is that the financial sector can play an important role in reducing shadow economy by improving the accessibility to financing and to the credit market.

Keywords: Modified-cash-deposit-ratio, Shadow Economy, Financial Sector Development, Malaysia
JEL Classifications: E26, H26, O17

1. INTRODUCTION

The presence of shadow economy in any nation is a fact of life (Schneider and Enste, 2000). Shadow economy is also related to criminal activities (Naylor, 1996; Habibullah and Eng, 2006). Shadow economy reduces the tax base and eventually reduces overall tax revenue and consequently may cripple an economy (Eilat and Zinnes, 2002). Furthermore, since the activity of the shadow economy is excluded from the official gross domestic product (GDP) statistics, thus, official GDP statistics will provide wrong indicators for macroeconomic policy decisions. Other than that, the existence of shadow economy creates opportunity for distortions in resource allocation especially in the labor market, whereby firms participate in underground activities are not subject to labor regulations and workers working underground are subjected to unhealthy and unsafe working conditions, very low wages and with no job security net (Eilat and Zinnes, 2002). Thus, fighting shadow economy should be an important agenda for any government.

However, estimating the size of the shadow economy is not an easy task as these players avoid detection and furthermore, authorities lacking the resources to monitor their activities (Singh et al., 2012). In the case of Malaysia, Kasipillai et al. (2000) have estimated the size of the Malaysian shadow economy for the period 1971-1994 using the standard currency demand approach; ranging from 8.1% to gross national product in 1971 to 3.73% in 1994. On the other hand, international studies by Schneider et al. (2010), Elgin and Oztunali (2012) and Alm and Embaye (2013) have also estimated the size of the shadow economy for Malaysia in a multi-country panel data framework. Schneider et al. (2010) estimated the size of the shadow economy for 162 countries including Malaysia for eight time periods that is 1999-2007. For the eight time periods, Malaysia's shadow economy averages 31% of the official GDP. Elgin and Oztunali (2012) estimated the magnitude of the shadow economy involving 161 countries over the period 1955-2008; with Malaysia's shadow economy averages 47%. On the other hand, Alm and Embaye (2013) estimated the size of the shadow economy for 111 countries for the period 1984-2006 and the estimated size for Malaysia's shadow economy averages 30% for the period.

The present paper estimates the size of the shadow economy in Malaysia for the period 1971-2013 by employing the modified-cash-deposit-ratio (MCDR) procedure recently proposed by Pickhardt and Sarda (2011; 2013); and further to investigates the factors affecting the Malaysian shadow economy during that period. In this study, our focus is on the role of financial sector development as a vehicle to reduce shadow economy in Malaysia. Our study concludes that financial sector development can play an important role in mitigating shadow economy in Malaysia. The paper is organized as follows. In the next section we review some of the related literature on factors affecting shadow economy. In Section 3, we discuss the model and method used to estimates the determinants of shadow economy in Malaysia. In Section 4, we discuss the empirical results. The last section contains our conclusion.

2. LITERATURE REVIEW

The drivers that cause people or firm participating in the shadow economy are numerous. Economists recognized that tax burden either direct or indirect taxation, social security contribution, regulation, tax morale, unemployment rate, GDP per capita (Schneider, 2005; Dell'Anno and Solomon, 2008; Bajada and Schneider, 2005); government spending or consumption (Vo and Ly, 2014; Wang et al., 2006; Buehn and Schneider, 2012); weak government and bad governance (Friedman et al., 2000; Manolas et al., 2013); lack of trust for the government (D'Hernoncourt and Meon, 2012); crime rate (Wang et al., 2006); and inflation (Bittencourt et al., 2014); are all contribute in increasing the size of the shadow economy.

Another strand of studies investigates how access to the financial or credit market could mitigate shadow economy. Numerous studies linking shadow economy and financial markets suggest that although formality imposes fiscal burden on a firm, such as taxes or costs of complying with regulatory requirements in the form of registration and license fee to be able to operate formally; benefits of being formal consist in the access to public goods and services. Straub (2005) posits that by assessing public goods, firms are protected by the police and the judicial system against crime so that output will not be disrupted and productivity can be enhanced with the use of public infrastructures. Furthermore, exchange of goods and services will be more efficient in the formal markets as enforcement of property rights and contracts are ensured and secured. In fact Singh et al. (2012) have stressed that firm operating in the shadow economy faced a variety of constraints that make it difficult for them to do business and grow. For them to expand and increase their productivity firm needs to have access to public infrastructures, electricity, land and water, institutions, access to new technology, access to external finance and other benefits associated with participation in the formal economy. Straub (2005) emphasize the role of the financial market in reducing the shadow economy. Straub (2005. p. 299) argues that "complying with costly registration procedures allows the firms to benefit from key public goods, enforcement of property rights and contracts that make the participation in the formal credit market possible." Antunes and Calvacanti (2007) contend that the benefit from formalization is better access to outside finance; and Quintin (2008) stresses that the size of the informal sector decreases as the degree to which financing contracts can be enforced in the formal sector rises.

According to Bose et al. (2012) in developed economies characterized by high level of financial development, individual or firm have easy access to the credit market. However, borrowers have to declare their income and/or assets and this can be used as collateral or to gauge their creditworthiness but in doing so they will subject to tax liability. Since the value provided by the financial intermediation is considerable (Gordon and Li, 2009), there is less incentive to evade tax and the need to participate in the shadow economy is minimal. Blackburn et al. (2012) explain the connection between shadow market activity and credit market development using a simple model of tax evasion and financial intermediation. In imperfect financial markets (with asymmetric information) potential borrowers are required to declare their income or wealth in order to acquire a loan to finance their investment. The amount of wealth will determine the amount of collateral for securing a loan and also the type of terms and conditions of the loan contract made available to them. Thus, the less wealth been declared, less collateral to secure the required loan and the worse will be the terms and condition of the loan contract. Blackburn et al. (2012) point out that at low level of financial development, the credit arrangement is worsen. Thus, the benefit of wealth disclosure increases with the level of financial development with the implication that individual or firm participate in the shadow economy decline as the economy moves from a low to high level of financial development.

Capasso and Jappelli (2013) provide a theoretical framework in which agents allocate investment between a low-return technology which can be operated with internal funds, and a high-return technology which requires external finance. Firm can reduce the cost of funding by disclosing part or all of their assets and pledging them as collateral. The disclosure decision, however, also involves higher tax payments and reduces tax evasion. Their model predict that financial development (a reduction in the cost of credit) induces firm to disclose more assets and to invest in a high-tech project, and an improvement in the judicial efficiency reduces the cost of credit and the size of the shadow economy. On the other hand, using a standard overlapping generation framework, Bittencourt et al. (2014) posit that both a lower (higher) level of financial development and a higher (lower) level of inflation lead to a bigger (smaller) shadow economy. Furthermore, societies with a higher (lower) level of financial development will have a lower (higher) cost of monitoring. Borrowers that choose to undeclared their income to the bank will be subjected to higher costs of access to and conditions of obtaining loans. These higher costs and with lower level of financial development, will provides an incentive for borrowers to participate in tax evasion activities.

3. DATA AND METHODOLOGY

In this study we specify the determinants of shadow economy for Malaysia as follows:

$$lshadow_t = \theta_0 + \theta_1 ltax_t + \theta_2 lunemp_t + \theta_3 lfindev_t + \theta_4 lfindev_t^2 + \omega_t \quad (1)$$

Where, $lshadow_t$ is the size of shadow economy (calculated using MCDR approach below); $ltax_t$ is ratio of tax revenue to GDP; $lunemp_t$ is unemployment rate; $lfindev_t$ is financial sector development measured by ratio of domestic credit to private sector by banks to GDP; $lfindev_t^2$ is financial sector development square to establish whether the relationship between shadow economy and financial sector development is non-linear. The error term is demoted by ω_t. It is expected a priori that θ_1, $\theta_2 > 0$. However, the expected sign for θ_3 and θ_4 is ambiguous. However, we conjecture that if the Malaysian data support the contention made by Blackburn et al. (2012), then there is a non-linear relationship between shadow economy and financial sector development with a priori expected sign, $\theta_3 > 0$ and $\theta_4 < 0$. This relationship implies that at lower stages of financial sector development shadow economy is increasing until at some point at higher level of financial sector development shadow economy starts to decrease, thus, exhibit an inverted U-shape curve.

In this study we compute the size of the shadow economy using the MCDR procedure proposed by Pickhardt and Sarda (2011; 2013). Using the Fisher's (1911) quantity theory of money, Pickhardt and Sarda (2011; 2013) arrive at the following MCDR, which equals the ratio of shadow economy income to official income:

$$\frac{C_iC_t - C_iC_0}{C_iC_0 - DD_t} = \frac{GDP_{Ut}}{GDP_{Lt}} \quad (2)$$

Where, C_iC_t denotes currency in circulation at the end of year t; C_iC_0 is currency in circulation at the end of base year, here 1971; DD_t represents demand deposits at the end of year t; GDP_{Lt} and GDP_{Ut} denote the size of the legal and shadow economy respectively. Thus, GDP_{Ut}/GDP_{Lt} measures the share of shadow economy to the legal economy (official GDP).

Data on tax revenue, gross GDP, unemployment rate, and domestic credit to private sector by banks were collected from the World Development Indicators published online and accessible at the World Bank database (http://data.worldbank.org/indicator/all). Data for currency in circulation and demand deposits were collected from various issues of the monthly Bulletin published by the Central Bank of Malaysia. The period of study is from 1971 to 2013. All variables were transformed into natural logarithm and denoted by *l*.

4. EMPIRICAL RESULTS

In Table 1, we present the results of the unit root tests as well as the cointegration tests for shadow economy in Malaysia. In Panel A, the unit root test results clearly indicate that all variables are *I*(1), that is the series achieved stationarity after first-differencing. These results clearly suggest that all variables are non-stationary in level. For estimating the long-run model as per Equation (1) and besides using ordinary least square (OLS), other procedures which are appropriate for small sample and can eliminate simultaneity or endogeneity bias include dynamic OLS (DOLS), fully modified OLS (FMOLS), and canonical cointegrating regression (CCR). Stock and Watson (1993) propose the dynamic OLS; Park (1992) introduces the canonical cointegrating regression; while Phillips and Hansen (1990) suggest the fully-modified OLS. However, the long-run model is valid or non-spurious if all variables in Equation (1) are cointegrated. To test for cointegration, for OLS we employ the conventional Engle and Granger (1987) two-step procedure for testing the null hypothesis of non-cointegration or the present of unit root on the residuals. On the other hand, for FMOLS, DOLS and CCR, we report the L_c-statistics, the test for the null hypothesis of cointegration.

Table 1: Results of unit root tests and long-run models for shadow economy in Malaysia

Panel A: DF-GLS unit root test					
	$lshadow_t$	$ltax_t$	$lunemp_t$	$lfindev_t$	$lfindev_t^2$
Level					
Int.	−0.72	−1.84	−0.83	−0.67	−0.68
	{1}	{1}	{0}	{0}	{0}
Int. and Trend	−2.25	−2.59	−3.08	−1.74	−1.79
	{1}	{0}	{3}	{0}	{0}
First-difference					
Int.	−3.04**	−6.88**	−5.39**	−5.22**	−5.54**
	{1}	{0}	{0}	{0}	{0}
Int. and Trend	−4.45**	−7.16**	−5.48**	−5.94**	−6.00**
	{1}	{0}	{0}	{0}	{0}
Panel B: Cointegration tests					
Estimators	**Intercept**	$ltax_t$	$lunemp_t$	$lfindev_t$	$lfindev_t^2$
OLS	−18.00**	1.07**	0.70**	7.63**	−0.82**
	(5.61)	(3.60)	(5.54)	(4.72)	(4.40)
E-G test: −3.88**					
FMOLS	−18.15**	1.58**	0.67**	7.02**	−0.75**
	(4.12)	(3.86)	(3.87)	(3.16)	(2.92)
L_c=0.56 [>0.20]					
DOLS/4,0/	−27.29**	2.91**	0.41**	8.88**	−0.88**
	(3.27)	(6.84)	(2.17)	(2.45)	(2.22)
L_c=0.04 [>0.20]					
CCR	−17.72**	1.66**	0.68**	6.70**	−0.71**
	(5.50)	(3.78)	(3.89)	(3.73)	(3.31)
L_c=0.50 [>0.20]					

Asterisk **denotes statistically significant at 5% level. The DF-GLS unit root test used in the study is proposed by Elliot et al. (1996) and this test has significantly greater power than the previous versions of the augmented Dickey-Fuller test. For this test the calculated statistics are those computed in MacKinnon (1996). The optimal lag length in curly brackets {.} was chosen based on SC criterion throughout the analysis. In this study, we used EViews8 and the software automatically selects the optimal lag length. For the long-run models, figures in round brackets (.) are t-statistics; figures in square brackets [.] are P values; figures in slash brackets/./is lead and lag for DOLS. For the cointegration tests; the E-G test denotes the DF t-statistic on the cointegrating regression's residual. L_c-statistic measures Hansen (1992) parameter instability test for cointegration. The E-G tests with null hypothesis of no cointegration while the Hansen test the null hypothesis of cointegration. OLS: Ordinary least square, FMOLS: Fully modified ordinary least square, DOLS: Dynamic ordinary least square, CCR: Canonical cointegrating regression

Generally, cointegration is detected for all four estimators used in the analyses. For OLS, the null hypothesis of non-cointegration can be rejected at the 5% level. On the other hand, the cointegration test shown by the L_c-statistics under FMOLS, DOLS and CCR suggest that the null hypothesis of cointegration cannot be rejected. In all cases, the long-run models of the shadow economy suggest that tax burden, unemployment rate and financial sector development

are important determinants of the Malaysian shadow economy. Our results suggest that increase in tax burden and unemployment rate increases the size of the shadow economy.

Our main interest emerge from this study is the non-linear relationship shown between shadow economy and financial sector development for Malaysia. As indicated by the sign of θ_3 being positive while θ_4 is negative, this suggests an inverted U-shape curve – a non-linear relationship between the shadow economy and financial sector development in Malaysia. The inverted U-shape curve suggests that as financial sector development progress in Malaysia from lower to higher level, shadow economy at first increases and then shadow economy decreases. Our findings support the contention by Bose et al. (2012), Blackburn et al. (2012) and Bittencourt et al. (2014) that access to finance is difficult at lower level of financial development and players seek alternative financing and participate in the shadow economy; but as financial sector development develops and becomes more sophisticated, access to finance will be much easier, cost of financing becomes cheaper, players willing to participate in the formal economy as the opportunity cost in participating in the shadow economy increases, thus, reducing the size of the shadow economy.

5. CONCLUSIONS

In the present study, we estimate the size of the shadow economy in Malaysia for the period 1971-2013. Further, we relate shadow economy with its determinants - tax burden, unemployment rate and financial sector development. Our estimated long-run models suggest that tax burden and unemployment rate increases the size of the shadow economy in Malaysia. Interestingly, our study reveal that the relationship between shadow economy and financial sector development in Malaysia was found to exhibit an inverted U-shape curve: Shadow economy increases at lower level of financial development but as financial development increases, shadow economy ultimately decreases. Thus, our findings support the earlier work of Bose et al. (2012), Blackburn et al. (2012) and Bittencourt et al. (2014). An important policy conclusion is that the Malaysian government should embark on programs that can reduce the size of the shadow economy, and easy access to the credit market and further reform of the financial sector should be the focus.

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