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THE VIRTUOUS AND THE VARIANCE OF THE VARIOUS APPROACHES FOR MEASURING SHADOW ECONOMY AROUND THE WORLD- IMPLICATIONS FOR POLICY MAKERS.

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ABSTRACT: *The period after World War II was marked by an upsurge in migration from the rural to urban areas in both developed and developing countries. During this period, colonies of Africa, Asia, and Central America achieved independence during the 1950s and1960s. Together, these factors contributed to the emergence of what is known as the shadow economy. Shadow economy is an active component of the majority, if not all, of the world's economies, though its size and measurements appears to vary considerably among countries. Researchers argued that underground economy should be included in GDP to the extent possible, given the obviously incomplete picture generated by ignoring such activity. The growing concerns about shadow economy have led many economists to the challenging and difficult task of its measurement and size, to trace back its main causes, and to analyze its interactions with the official economies. It seems unlikely that robust estimators can be developed without a clear understanding of both the underlying economic theory describing how shadow economies come about and what drives the level of activity in each component sector of any economy.*

KEYWORDS: Virtuous, Measuring Shadow, Economy, Policy Makers

INTRODUCTION

The term shadow economy or underground economy refers to unreported or untaxed economic activity (Kelly, 2007). Shadow economy is also defined as the concealment of all market-based legal production of goods and services from public authorities (McGee, 2005; Schneider, 2007). No single definition exists for shadow economy; rather, its definition depends on the purpose of the researcher (Feige & Urban, 2008). The most precise and widely used definition of shadow economy relates the underground economy (unofficial income) to officially measured national income. According to this definition, the shadow economy consists of all currently unrecorded productive or value-adding activities that should be in the gross national product (GNP) (Schneider, 2000; Torgler & Schneider, 2007). This definition allows policy makers and economists to compare and to add the underground economy to the gross domestic product (GDP).

For countries all over the world, there are several important reasons for concern about the size and growth of the shadow economy (Dreher & Schneider, 2006). One reason is that when the

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shadow economy grows, economic policy is based on erroneous official indicators, such as unemployment, official labor force, income, and consumption (Rockwool Foundation, 2008). In such a situation a prospering shadow economy may cause the government severe difficulties, because it provides unreliable official indicators. Consequently, the very direction of intended policy measures may be questionable. A second reason for concern is that the rise of the underground economy can be seen as a reaction by individuals who feel overburdened by state activities, such as high taxes and an increasing number of regulations (Schneider, 2005).

Additionally, an increase in the size of the underground economy is mainly caused by a rise in the overall burden of tax and social security payments by taxpayers (Schneider, 2006; Torgler & Schneider, 2007). This increase may lead to an erosion of the tax and social security bases, and finally to a decrease in tax receipts for government (Elijah & Uffort, 2007; Schneider, 2000; 2005). The consequence would be a further increase in the budget deficit or further rise of direct and/or indirect tax rates. Shadow economic activities would then increase (Schneider, 2007).

Lastly, a growing shadow economy may offer strong incentives to attract workers, both domestic and foreign. These workers would then contribute less within the official economy (Dreher & Schneider, 2006; Schneider, 2000). These growing worries have led many economists to the challenging and difficult task of measuring the size and development of the shadow economy, to trace back its main causes, and to analyze the interactions of the official and unofficial economies (Feige & Urban, 2008; Schneider & Burger, 2005).

Purpose

Many experts on countries that are transiting from one economic state to another (transition countries) and developing countries have claimed that a large part of economic activities were done within the shadow economy (Dreher & Schneider, 2006; Pickhardt & Sarda-Pous, 2006; Schneider, 2007; Tunyan, 2005). In applying the estimation techniques for measuring shadow economy for the period 1995–2000, the results indicated the size of shadow activities to be 35–44% of GDP for developing economies, 21–30% of GDP for the countries transiting from communist to capitalist economy (transition economies) and 14–16% of GDP for the Organisation for Economic Co-operation and Development (OECD) economies (advance economies (Amar, 2004; Elijah & Uffort, 2007). The value of the shadow economy grew from about 7.9% of GDP in 1976 to about 16% in 2001 (Choi & Thum, 2004; Tedds, 2005). The shadow economy was considered by many studies to inhibit development in developing countries and to have eroded the existing welfare state in the developed countries. Underground economies also have a significant long-term negative effect on the generation of societal wealth (De Soto, 2005; Dreher & Schneider, 2006; Feige & Urban, 2008; Nikopour, Habibullah, & Schneider, 2008). The investigation of shadow economic activity has a certain appeal in economic studies for policy making and economic growth (Bajada & Schneider, 2005). Therefore, policy makers need accurate size of shadow economic activities and its impacts on official economy and economic growth so that they can better understand, estimate, and suggest methods of solving the problems associated with its presence.

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THEORETICAL FRAMEWORK

In the last 20 years publications have increased, concerning methods and estimates of shadow economy (Cowell, 1990; Eilat & Zinner, 2000; Feige, 1994; Giles & Tedds, 2002; Pedersen, 1998; Schneider & Enste, 2000; Thomas, 1999). From these publications, different techniques that have been developed to estimate the level of shadow economy were presented. Usually, the methods are being placed into three groups: namely the model approach, the direct approach and indirect approach (Feige & Urban, 2008). The model approach or MIMIC method is based on the statistical theory of latent variables, which considers several causes and several indicators of the shadow economy (Schneider, 2005; 2007; Taylor, 1996). Frey and Weck-Hanneman (1984) have been the first to consider the size of shadow economy as an unobservable variable. Frey and Weck-Hanneman used the MIMIC model introduced by Zellner (1970), Goldberger (1972), Joreskog and Goldberger (1975), and others in this field. The model approach is a member of the Linear Interdependent Structural Relationships (LISREL) family of models (Dreher & Schneider, 2006).

Following Frey and Weck-Hanneman's example, others economists who used this model for their statistical analysis of the shadow economy are: Aigner, Schneider, and Ghosh (1988), Chatterjee, Chaudhuri, and Schneider (2003), Cassar (2001), Dell' Anno, Gomez, & Pardo (2004), Eilat and Zinnes (2000), Giles (1999), Giles and Tedds (2002), Helberger and Knepel (1988), Loayza (1996), Pozo (1996), Prokhorov (2001), Salisu (2000), Schneider (2007), and Tedds (1998). The Structural Equation Modeling (SEM), SEM is statistical relationships among latent (unobserved) and manifest (observed) variables (Dell'Anno, Gomez-Antonio, & Pardo, 2007; Feige & Urban, 2008). SEM implies a structure of the empirical or database covariance matrix which, once the parameters have been estimated, can be compared to the resulting model-implied covariance matrix (Dell'Anno, 2004; Dell'Anno et al., 2004; 2007; Schneider, 2007). If the two matrices are consistent with one another, then the structural equation model can be considered as a likely explanation for the relations among the examined variables. Compared with regression and factor analysis, SEM is a relatively new tool (Dell'Anno & Schneider, 2009; Dell'Anno et al., 2004). Comprehensive discussions of SEM are available in the fields of sociology (Bielby & Hauser, 1977), psychology (Bentler, 1986), and economics (Aigner et al., 1988; Goldberg, 1972). Overviews of SEM are also available (Bollen, 1989; Byrne, 1998; Dell'Anno et al., 2007; Hayduk, 1987; Hoyle, 1995; Maruyama, 1997; Taylor, 1996).

As Cooley (1978) wrote, SEM approach allows to establishing the plausibility of a theoretical model and to determine the degree to which the explanatory variables have an effect on the unobservable variable. SEM is an alternative way to test the consistency of a structural theory through data; in this sense, it is a largely confirmatory, rather than exploratory, technique (Dell'Anno, 2004; Dell'Anno & Schneider, 2009). Therefore, SEM can be used to determine whether a certain structure is valid, rather than using it to find a suitable model.

In the work of Dell'Anno (2004), Dell'Anno and Schneider (2009), Dell'Anno et al. (2007), and Schneider (2007), one special case of SEM is used: the Multiple Indicators and Multiple Causes (SIMIC) model of Joreskog and Goldberg (1975). They applied SIMIC model as follow: The

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shadow economy (η) is linearly determined, subject to a disturbance ζ, by a set of observable exogenous causes *x*1, *x*2… *x*q:

$$\eta = \gamma 1\ x1 + \gamma 2\ x2 + ... + \gamma q\ xq + \zeta \quad (1)$$

The latent variable (η) determines, linearly, subject to a disturbances ε1, ε2, … , εm, a set of observable endogenous indicators *y1, y2, ... , yp*:

$$Y1 = \lambda 1\ \eta + \varepsilon 1,\ y2 = \lambda 2\ \eta + \varepsilon 2 ...,\ yp = \lambda p\ \eta + \varepsilon p. \quad (2)$$

According to Dell'Anno (2004), the structural disturbance **ζ**, and measurement errors **ε** are all normally distributed, mutually independent and all variables are taken to have expectation zero. Considering the vectors: x**'** = (*x1, x2, ... , xq*) observable exogenous causes, **γ** = (*γ1, γ2, ... , γq*) structural parameters (Structural Model), y**'** = (*y1, y2, ... , yp*) observable endogenous indicators, **λ** = (*λ1, λ2, ... , λp*) structural parameters (Measurement Model), ε = (ε1, ε2, … , εp) measurement errors, υ = (υ1, υ2, … , υp) standard deviations of the **ε**'s

Therefore, the (1) and (2) are wrote as:

$$\eta = \gamma\ 'x + \zeta \quad (3)$$

$$y = \lambda\eta + \varepsilon \quad (4)$$

by assuming $E(\zeta\varepsilon') = 0'$ and defining $E(\zeta 2) = \sigma 2$ and $E(\varepsilon\varepsilon') = \Theta 2$, where Θ (pxp) is diagonal matrix with *υ*, displayed on its diagonal. The model can be solved for the reduced form as function of observable variables:

$$y = \lambda(\gamma\ 'x + \zeta) + \varepsilon = \Pi' x + v \quad (5)$$

the reduced form coefficient matrix and disturbance vector are respectively:

$$\Pi = \gamma\lambda', \text{ and } v = \lambda\zeta + \varepsilon.$$

Therefore, is obtained the covariance matrix (model-implied):

$$\hat{\Sigma} = E(vv') = \sigma 2\lambda\lambda' + \Theta 2. \quad (6)$$

According to Dell'Anno et al. (2007), the assumption of Joreskog and Goldberg on independence between structural disturbance **ζ**, and measurement errors **ε** is central to the reliability of estimates. Unluckily, previous studies do not test this hypothesis and, the SEM packages, do not perform test about it (Dell'Anno et al.). This constraint on disturbances could be considered too restrictive mainly using economic dataset and, consequently, espoused to question the validity of this approach (Dell'Anno & Schneider, 2009). Fortunately, as Hayduk (1987) explained that, it is purely *a* matter of arbitrary convention. According to Hayduk, the tests do not reject the hypothesis of independence between structural and measurement errors; therefore, the MIMIC was correctly applied (Dell' Anno et al., 2004; 2007; Feige & Urban, 2008).

According to Bollen (1989), the SEM equations are regression equations with less restrictive assumptions that allow measurement error in the explanatory as well as the dependent variables (Dell' Anno et al., 2007). For the Lisrel nomenclature, the equations system with the

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relationships among the latent variable (η) and the causes (Xq) is called structural model, the links among indicators (Yp) and underground economy is the measurement model (Dell' Anno et al., 2004; Schneider, 2005; 2009). An analytical representation of the most general model identified (MIMIC) is below:

Structural Model

$$\eta = \gamma 11 \; X12 + \gamma 12 \; X2 + \gamma 13 X3 + \gamma 14 \; X4 + \gamma 15 \; X5 + \gamma 16 \; X6 + \zeta \quad (7)$$

Measurement Model:

$$Y1 = \lambda 11 \; \eta + \grave{E}1 \quad (8)$$

$$Y2 = \lambda 21 \; \eta + \grave{E}2 \quad (9)$$

To facilitate the identification of SEM three conditions are available but, unfortunately, none of these is a necessary and sufficient condition (Bollen, 1989). Especially in the case of Joreskog and Goldberg model the following restrictions are respected (Bollen, 1989): The necessary (but not sufficient) condition, so-called t-rule, enunciates that the number of non-redundant elements in the covariance matrix of the observed variables must be grater or equal to the number of unknown parameters in the model-implied covariance matrix (Dell' Anno et al., 2007). A sufficient (but not necessary) condition of identification, is that the number of indicators is two or greater and the number of causes is one or more, provided that to η is assigned a scale (MIMIC rule) (Dell' Anno et al., 2007).

In accordance with these conditions, the MIMIC models of Joreskog and Goldberg are built to estimate the size of shadow economy as percentage of GDP. A relevant point, often undervalued in the earlier analyses of shadow economy with SEM, is the discovery of multivariate normality (Dell' Anno et al., 2004; Schneider, 2007). This assumption is essential to safeguard the statistical properties of estimators, as well as the chi-square tests used to appraise the appropriate of models with the dataset. The next paragraphs are devoted for discussion of other methods of measuring shadow economy. The direct methods of measuring shadow economy are based on contacts with or observations of persons and/or firms, to gather direct information about not declared income. There are two kinds: (a) micro surveys and (b) the auditing of tax returns (Dell'Anno 2004; Dell' Anno et al., 2004; Feige & Urban, 2008).

Micro surveys

Micro surveys methods is the method that exploit data on individual tax payers and either relies on surveys or on information retrieved from tax audits (Schneider, 2008). These are micro approaches that utilize both well designed surveys and samples based on voluntary replies, or tax auditing and other compliance methods. Sample surveys designed to estimate the shadow economy are widely used in a number of countries (Schneider, 2006; 2007; Williams, 2006). The major shortcoming of this method is that it presents the flaws of all surveys. For example, the average exactness and outcome depend greatly on the respondent's willingness to cooperate, it is difficult to evaluate the amount of undeclared work from a direct questionnaire, most

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interviewees hesitate to admit fraudulent behavior, and responses are of uncertain reliability, which makes it difficult to calculate a real estimate in monetary terms of the extent of undeclared work (Fuest & Riedel, 2009; Schneider, 2006). The major advantage of this technique lies in the detailed information about the structure of the shadow economy, but the results from these kinds of surveys are very sensitive to the way the questionnaire is formulated (Feld & Larsen, 2005; Schneider, 2009). Thus, micro surveys may provide an extreme lower bound to shadow activity (Schneider, 2007).

Tax audits

Estimates of the shadow economy can also be based on the discrepancy between income declared for tax purposes and that measured by selective checks (Schneider, 2006). Fiscal auditing programs have been predominantly effective in this regard. Since these programs are designed to measure the amount of undeclared taxable income, they may also be used to calculate the shadow economy (Schneider, 2066; 2007). Schneider (2006) argued that a number of difficulties weighed down this approach. First, using tax compliance data is equivalent to using a possibly biased sample of the population. In general, the selection of tax payers for tax audit is not random but based on properties of submitted tax returns that indicate a certain likelihood of (tax) fraud. Consequently, such a sample is not a random one of the whole population, and estimates of the shadow based upon a biased sample may not be accurate (Otusanya, 2006; Schneider, 2006; 2007).

Second estimates based on tax audits reveal only that portion of shadow economy income that the authorities succeed in discovering, and this is likely to be only a tiny proportion of hidden income (Eilat & Zinnes, 2000; Gerxhani, & Schram, 2006; Schneider, 2006). The Indirect methods try to determine the size of hidden economy, by measuring the traces that it leaves in official statistics. They are often called "indicator" approaches and using mainly macroeconomic data (Dell' Anno et al., 2007). Currently there are five indicators that leave some traces of the shadow economy (Feige & Urban, 2008; Feld & Larsen, 2005; Otusanya, 2006; Schneider, 2006).

The discrepancy between national expenditure and income statistics approach

This approach is based on discrepancies between income and expenditure statistics. In national accounting, the income measure of GNP should be equal to the expenditure measure of GNP (Schneider, 2006). Thus, if an independent estimate of the expenditure site of the national accounts is available, the gap between the expenditure measure and the income measure can be used as an indicator of the extent of the black economy (Schneider, 2006; Thomas, 1999). Since national accounts statisticians are anxious to minimize this discrepancy, the initial discrepancy, or first estimate, rather than the published discrepancy should be employed as an estimate of the shadow economy (Buehn & Schneider, 2009; Schneider, 2006). If all the components of the expenditure site are measured without error, then this approach would indeed yield a good estimate of the scale of the shadow economy (Schneider, 2006). Unfortunately, however, this is not the case (Feld & Larsen, 2005). Instead, the discrepancy reflects all omissions and errors everywhere in the national accounts statistics as well as the shadow economy activity. These

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estimates may therefore be very crude and of questionable reliability (Del Boca, 1981; Feige, 1996; Gerxhani, & Schram, 2006; Schneider, 2006).

The transactions approach

This approach has been most fully developed by Feige (Schneider, 2006; 2007). According to Schneider, the transactions approach is based upon the assumption that there is a constant relation over time between the volume of transaction and official GNP, as summarized by the well-known Fisherian quantity equation, or $M*V = p*T$ with M = money, V = velocity, p = prices, and T = total transactions. Schneider argued that assumptions also have to be made about the velocity of money and about the relationships between the value of total transactions ($p*T$) and total (=official + unofficial) nominal GNP. Relating total nominal GNP to total transactions, Schneider said that the GNP of the shadow economy can be calculated by subtracting the official GNP from total nominal GNP (Schneider, 2006). According to Schneider, to derive figures for the shadow economy, one must also assume a base year in which there is no shadow economy and therefore the ratio of $p*T$ to total nominal (official = total) GNP was normal and would have been constant over time, if there had been no shadow economy. This method, too, has several weaknesses, such as the required assumptions of a base year with no shadow economy, and of a "normal" ratio of transactions to nominal GNP (Schneider, 2006). Moreover, to obtain reliable shadow economy estimates, precise figures of the total volume of transactions should be available, and this availability might be especially difficult to achieve for cash transactions, because they depend, among other factors, on the durability of bank notes in terms of the quality of the paper on which they are printed (Lyssiotou, Pashardes, & Stengos, 2004; Schneider, 2006).

The currency demand approach

The currency demand approach was first used by Cagan (1958), who calculated a correlation of the currency demand and the tax pressure (as one cause of the shadow economy) for the United States over the period 1919 to 1955. 20 years later, Gutmann (1977) used the same approach but without any statistical procedures (Schneider & Klinglmair, 2004). Cagan's approach was further developed by Tanzi (1986; 1999), who econometrically estimated a currency demand function for the United States for the period 1929 to 1980 in order to calculate the shadow economy. His approach assumes that shadow (or hidden) transactions are undertaken in the form of cash payments, to leave no observable traces for the authorities (Schneider & Klinglmair, 2004). An increase in the size of the shadow economy will therefore increase the demand for currency. To segregate the resulting excess demand for currency, an equation for currency demand is econometrically projected over time. All conventional possible factors, such as the development of income, payment habits, interest rates, and so on, are controlled (Breusch, 2005; Schneider & Klinglmair, 2004).

Additionally, such variables as the direct and indirect tax burden, government regulation and the complexity of the tax system, which are assumed to be the major factors causing people to work in the shadow economy, are included in the estimation equation (Schneider, 2007; Schneider & Klinglmair, 2004). The basic regression equation for the currency demand, proposed by Tanzi (1999), is the following:

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$$ln\ (C / M_2)_t = \beta_O + \beta_1\ ln\ (1 + TW)_t + \beta_2\ ln\ (WS / Y)_t + \beta_3\ ln\ R_t + \beta_4\ ln\ (Y / N)_t + u_t\ with\ \beta_1 > 0,\ \beta_2 > 0,\ \beta_3 < 0,\ \beta_4 > 0$$

Where ln denotes natural logarithms, C/M_2 is the ratio of cash holdings to current and deposit accounts, *TW* is a weighted average tax rate (to proxy changes in the size of the shadow economy), *WS/Y* is a proportion of wages and salaries in national income (to capture changing payment and money holding patterns), *R* is the interest paid on savings deposits (to capture the opportunity cost of holding cash) and *Y/N* is the per capita income (Breusch, 2005; Schneider, 2007; Schneider & Klinglmair, 2004).

Any excess increase in currency, or the amount unexplained by the conventional or normal factors (mentioned above) is then attributed to the rising tax burden and the other reasons leading people to work in the shadow economy (Schneider, 2007). The currency demand approach is one of the most commonly used approaches. It has been applied to many OECD countries (Belev, 2003; Johnson et al., 1998), but has nevertheless been criticized on various grounds (Schneider, 2007; Swank, 2006).

Total electricity use

Pioneered by Kaufman and Kaliberda in transition economies, the method measures overall economic activity by assuming that electric power consumption and total (official and unofficial) GDP move together so that the ratio of GDP to electricity consumption is constant. Under such assumptions, the growth of total electricity consumption reflects growth in total GDP. After the growth in total GDP is found, the difference between the growth rate of registered GDP and the growth rate of total GDP is attributed to the growth in the shadow economy. The strength of this method is that it is very simple and inexpensive to implement (Schneider, 2007).

As the method has been applied to date, however, its weaknesses are many. First, not all shadow activities use energy, and electricity in particular. Second, technical progress that changes the efficiency of use of energy may change the GDP/energy ratio across time and countries. So can many other factors such as changes in industrialization, efficiency changes in the industry, and changes in energy prices. These problems become particularly manifest during transition when the share of industry typically contracts profoundly and the share of non-energy intensive agriculture expands. In addition, liberalization of the energy market could cause big changes in the pattern of energy and electricity use. Finally, the massive modernization efforts associated with transition will undoubtedly increase the energy efficiency of output (Schneider, 2007).

Household electricity use. Developed by Lacko (1996; 1998; 1999; 2000) assumes that a certain part of the shadow economy is associated with the household consumption of electricity (Schneider, 2007). This part comprises the so-called household production, do-it-yourself activities, and other non-registered production and services. Lacko further assumes that in countries where the portion of the shadow economy associated with the household electricity consumption is high, the rest of the hidden economy (or the part Lacko cannot measure) will also be high. Lacko (1999) assumes that in each country a part of the household consumption of electricity is used in the shadow economy (Schneider, 2007).

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From Schneider (2007), Lacko (1999) approach can be described by the following two equations:

$$ln\, E_i = \alpha_1\, ln\, C_i + \alpha_2\, ln\, PR_i + \alpha_3\, G_i + \alpha_4\, Q_i + \alpha_5\, H_i + u_i \quad (1)$$

with $\alpha_1 > 0,\ \alpha_2 < 0,\ \alpha_3 > 0,\ \alpha_4 < 0,\ \alpha_5 > 0$

$$H_i = \beta_1\, T_i + \beta_2\, (S_i - T_i) + \beta_3\, D_i \quad (2)$$

with $\beta_1 > 0,\ \beta_2 < 0,\ \beta_3 > 0$

where i: the number assigned to the country, E_i: per capita household electricity consumption in country i in Mtoe, C_i: per capita real consumption of households without the consumption of electricity in country i in US dollars (at purchasing power parity), PR_i: the real price of consumption of 1 kWh of residential electricity in US dollars (at purchasing power parity), G_i: the relative frequency of months with the need of heating in houses in country *i*, Q_i: the ratio of energy sources other than electricity energy to all energy sources in household energy consumption, H_i: the per capita output of the hidden economy, T_i: the ratio of the sum of paid personal income, corporate profit and taxes on goods and services to GDP, S_i: the ratio of public social welfare expenditures to GDP, and D_i*:* the sum of dependants over 14 years and of inactive earners, both per 100 active earners (Schneider, 2000; 2007).

In a cross country study, Lacko econometrically estimates equation (1) substituting H_i by equation (2). The econometric estimation results can then be used to establish an ordering of the countries with respect to electricity use in their respective shadow economies. For the calculation of the actual size (value added) of the shadow economy, Lacko need to know how much GDP is produced by one unit of electricity in the shadow economy of each country. Since these data are not known, Lacko took the result of one of the known shadow economy estimations carried out for a market economy with another approach for the early 1990s, and applies this proportion to the other countries. Lacko used the shadow economy of the United States as such a base (the shadow economy value of 10.5% of GDP taken from Morris (1993), and then calculated the size of the shadow economy for other countries. Lacko's method is open to criticism: (a) not all shadow economic activities require a considerable amount of electricity and other energy sources can be used, (b) shadow economy activities do not take place only in the household sector, and (c) it is doubtful whether the ratio of social welfare expenditures can be used as the explanatory factor for the shadow economy, especially in transition and developing countries (Schneider, 2000; 2009).

RECOMMENDATIONS AND CONCLUSIONS

Shadow economies have been associated with significant long-term negative effect on the generation of societal wealth (De Soto, 2005; Dreher & Schneider, 2006). Shadow economy was considered by many studies to inhibit development in developing countries and to have eroded the existing welfare state in the developed countries (Feige & Urban, 2008; Nikopour, Habibullah, & Schneider, 2008). Existing studies on shadow economy have been framed almost entirely to cover such discussions as size, causes, consequences, characteristics, and the effect of government policies on shadow economic activities. Although these studies are valuable, the body of quantitative underground economy research, as a whole remains skewed on an

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acceptable method of its measurement. Most existing research on shadow economy involved the exploration of public finance and policy implications of shadow activities and not much on a standard measurement method (Bajada & Schneider, 2005; Feige & Urban, 2008). In addition, shadow economy long-term negative impacts on the official economy, government policies, and economic growth remains largely unexamined through quantitative research. Furthermore, the negative effects of the shadow economy in countries, including corruption, economic retardation, developmental disabilities, and lack of adequate revenue to the governments has been marginalized.

RECOMMENDATIONS

There were prior research studies in the area of underground economy; however, there was no quantitative study regarding its measurement. The research study builds on the current body of knowledge regarding shadow economy to provide a foundation from which further research studies could be developed to examine other methods that could enhance its acceptable measurement, which was the focus of this research work.

The findings from the study may also assist various governments with different level of shadow economy measurement method to design policy measures in arriving at an accurate size of shadow economy and to reducing the impacts of shadow economy on their official economy. Additionally, the study may help in further researches on activities of shadow economy as its affect different economies. In addition, the findings of this study may also assist policymakers in identifying desirable policy measures previously unrecognized or underutilized in the process of solving the attendance problems of shadow economy based on appreciate measurement. The following recommendations have been developed based on results of this study's findings.

The countries revenue agencies should consult with private sector organizations and associations and promote voluntary compliance through visits to businesses for a wider statistical base for its measurement. In addition, countries revenue agencies should be dynamic in pursuing definite legislative changes such as the introduction of a new compulsory requirement for proper identification and reporting income in the construction business (where shadow economy is high), and a new reporting structure for all federal government services contracts.

Government of Countries should announced new plan to combat the shadow economy by allocating staff to the non-filers and non-registrants program and more staff to the audit of small businesses, where most of the shadow economy activity exists. A reasonable percent of the department's audit staff should be allocated for small and medium-sized businesses to be strictly involved in the shadow economy scheme audit activities. These staff should be trained to audit small business taxpayers who have inadequate tax records.

Findings in this study have others implications for various countries as well. Undoubtedly, most policy actions that strengthen economic growth of the official economy will have an effect of encouraging businesses to move out of the shadow economy. The question is whether, in addition to these, there are actions policymakers could pursue whose main purpose would be to frankly influence the size of the underground economy and make its measurement difficult. The

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following are some of the several types of actions that may be considered by policymakers from many nations in this regard.

Discourage the usage of swap scheme

The use of swap facilitates underground economic activities around the world. Some governments, nevertheless, themselves use barter to pay for services when their tax receipts do not cover expenditure commitments. This sends erroneous signals to the private sector and eventually creates an environment that encourages business in the underground economy and reduces any stigma associated with it. To the extent that this practice leads the private sector to engage in further barter, the government's use of barter carries a negative unintentional or concealed cost and therefore should be strongly discouraged in any economy.

Stimulate dynamic tax system

One of the main motivations of underground activity is to evade taxes. Tax reform can directly address this. Such reform should comprise several components. First, improved administration would comprise better supervision mechanisms, tax compliance audits, and additional funding for staff that are more qualified and their training. Second, an improved tax code would address simplifying the number of exceptions, exclusions, and would lower tax rates. One way to lower tax rates is to increase the tax base by using a greater diversity of tax instruments and by introducing; a self-enforcing VAT (if one is not already in place). One example of a powerful tax reform is the computerization of revenue agency operations, together by a reduction in the number of tariff categories; this will eventually promote accurate measurement of shadow activities in the economy.

Initiate better enumeration

Since the underground economy by definition includes unrecorded activity, improved statistical methods and procedures by the national statistical office and its reporting agencies would improve the government's knowledge of the true state of the economy and its measurement. Another area for better enumeration concerns eligibility lists for social safety net benefits. These provide an incentive to operate in the underground economy since an employee can then engage in double dipping by receiving, unemployment benefits and a payment from a firm that operate in the shadow economy.

CONCLUSION

The incidence of shadow economy has different root causes in the various countries. Shadow economy characteristics even differ within countries. Accordingly, different measurement approaches towards the underground economy should be used in different countries. In addition, policy measures to combat shadow economy should be robust. Therefore, constant adjustment should not be necessary for successful measurement operation. Rather, the measures should contain a broad selection of implements and models, which can be used in different situations and circumstances as they appear.

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