Measuring the Size of Under Ground Economy in Pakistan: A Microeconomic Approach

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ABSTRACT

To know the unknown in the official records is the dilemma that almost faced by every country around the world. In the developing countries like Pakistan this problem is more than the developed ones. The reason behind this scenario might be that their tax systems are more stable and that no one needs to hide the economic activities in the fear to be caught and punished by the law. But the country like Pakistan where exact / actual economic activities are not fully recorded, poor reflection leads to false implications of the policies. This study has made an attempt to measure the UGE through 'Expenditure based' method of Pissarides and Weber in Pakistan. A micro dataset PSLM 2011-2012 (provincial level) is used. This approach is based upon the assumptions self-employed can under-report their income, but not the employees because tax is directly deducted from their wages and salaries. The second is that both groups (employees and self-employees) report their consumption expenditures accurately. According to the results the amount by which income is under-reported is 1.08 times of the reported income. Almost 13.1% of self-employed underreport their income. It concludes that the UGE is 14.148% of GDP in the year 2012.

KEYWORDS: UGE; Informal Economy; Hidden Economy; Shadow Economy; Pakistan

JEL Classification: E26

1. INTRODUCTION

Frequently overlooked, but still very active, sector and the fact of life from which world cannot turn its back is the underground economic activity (UGE) [36]. A strong indication found that it is consistently increasing around the world. As a recent study of IMF done by Schneider and Enste (2002) marked that the size of UGE shows upward trend and become severe especially in developing countries. The concept of the UGE gained attention of the researchers in the 70's [40] right after the publication of Guttman who attempted to estimate the size of UGE for US economy [20]. This phenomenon is not only important for economists, but also for policy makers because high quality national accounts usually are vital for economic policy making and research [1]. Given the individuals who are engaged in these activities do not strive to be identified; it is rather difficult to obtain accurate details about these undercover activities [36]. For this reason, the evaluation of underground economic activities (UGEA) could be a controlled passion with regard to knowing this unknown. In addition, little may be known about exactly what motivates individuals to function in this underground economic environment [OECD, 2002].

UGEA reflect attempts by economical agents to avoid taxes and rules, practice illegal activities, as well as the activities of people and small units operating with the boundary outside the particular formal economy [38]. A large and also growing UGE leads into inaccurate signals concerning the economy and thus execute policy endorsements suboptimal. On the other side, it also affects the Government's fiscal position. To the extent that the underground output could be taxable income, it is associated with a loss in tax revenues, while, simultaneously, the UGE agents benefit from Government services. Expenditures by the government will exceed its revenues collected through taxes, creating a problem of deficit in the fiscal budget [36] and a continual deficit problem could be increased financing leading to major adverse economic outcomes, particularly in a developing country with a weaker tax basis [31]. In a result, the government might either monetize the deficit with significant uncomfortable side effects on financial stability or enhance the tax rate thus causing a transferring of resources from the formal economy to the UGE [35].

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Underground economic activity is an undeniable truth of the word. Most of the societies around the world have taken initiatives to control it, but it is constantly increasing. The particular role played by UGE is clearly connected to its size [31]. Major problem lying behind the failure is the measurement of size and its magnitude. So, for effective implications of the policies; this problem of measurement has to be resolved [34]. Indeed, people who are active in such activities keep their participation secret in order to escape themselves from penalties [2]. The very hurdle in measuring the UGE is the lack of its precise definition [19]. Different authors defined UGE activities differently; the definition followed in this study is of Smith (1986), accordingly it includes all those activities which should be reported and taxed normally but is not. He further concludes that such activities are normally concerted among the self-employed, who usually run small businesses [38].

Most empirical work relies on the macroeconomic relationships to estimate the size of the UGE. The commonly used method is the monetary approach which has further two dimensions; transaction method given by Feige (1979) and the currency ratio of Tanzi (1980). Model approach proposed by Frey and Weck-Hannemann (1984) named as Multiple Indicator and Multiple Causes (MIMIC) also criticized due to lack of base theory, unit of measurement, sensitive to transformation of data and its dependence on monetary or input method. Another approach named as electricity consumption approach or physical input method proposed by Kaufmann and Kaliberda (1996) and then followed by Garvanlieva et al., (2012); Arby et al., (2010) and Gulzar et al., (2010). The critics of this approach point out that it ignores the technological advancements over the time. Moreover, it captured only a part of the UGE because other sources like gas, coal, etc. might be used in the shadow activities [34].

Some studies use microeconomic data which include surveys or tax-auditing by Kazemier and Van Eck (1992), to measure the unreported income. The second method developed by Pissarides and Weber (1989) known as an 'expenditure-based' method. In this method the part of income is calculated that is under-reported by the self-employed head through estimation of the demand equation for food. The approach followed in this paper is based on "Household Expenditure' model. People usually under-report their actual income for the purpose to avoid taxes, or may wanted to conceal their hidden income sources from the fear that they might not be protected by the law and may be punished.

The monetary approach was first given by Gutmann (1977) and Feige (1979) and an econometric tool was firstly applied by Tanzi (1980). Gutmann (1977) used ratio of currency to demand deposits (C/D), as a dependent variable which is directly influenced by taxes and regulations and any change in C/D ratio depicted the change in the shadow economy. On the other hand Feige's (1979) method was based on the quantity theory of money (QTM) to measure the size of the shadow economy. Rehman and Khan (2012) measured UGE of Bangladesh through transaction approach proposed by Feige (1979) from 1980-2010. During the period, the size of the UGE, increased substantially from 9% of GDP in 1981 to 52% till 2010. But Gadea and Serrano-Sanz (2002) preferred currency held by the public as a variable for hidden activities in Spain. All the variables like legal income, inflation, interest in liquid assets, financial innovations, fiscal variables and probability of detection and penalty for undeclared income showed significant and strong impact on the shadow economy except indirect taxes and social security contributions.

The same link of Feige was rehypothesized by Tanzi (1980) to measure the size of the US's black economy. According to this approach the main cause of the hidden economy is the tax burden, so whenever tax rate increases; size of the unrecorded economy will also increase. The Tanzi's model was; ratio of currency in circulation to money supply (C/M2) as a function of tax rate, interest rate, per capita income and share of wages and salaries to national income. A lot of studies used Tanzi's approach with some modification to measure the size of the hidden economy [7; 32]. Maurin et al., (2006) used time series data from 1970 to 1990 to calculate the size of the hidden economy in Trinidad and Tobago and concluded that the magnitude of the hidden economy varies from 14% of GDP in 1970's and reached at its highest level to 36% in 1981and 20% in 1990's. On the other hand, Ardizzi et al., (2014) brought three modifications in Tanzi's Approach while measuring the UGE of the 91 provinces of Italy for the period 2005-2008. The dependent variable previously based on Fisher's equation was modified to direct measure of cash transaction. Secondly a variety of tax burden was exchanged with other variables along with controlling the presence of illegal activities. All these modifications helped to overcome the weaknesses of previous traditional approach. The size of the UGE economy slightly increased from 24.7% to 31.1% of GDP. A major distinction was found in the results. The size of UGE increased from 11% to 21.4 % of GDP on including the criminal activities.

Giles (1998) reviewed the work of some authors for the purpose to measure the size and determinants of the HE in New Zealand. Large tax burden, a system of tax-mix (personal tax & indirect tax) policy and regulations in the labor market were the factors responsible for higher HE. As HE in New Zealand increased from 6.8% to 11.3%, 1968 to 1994 respectively, the tax - gap also raised from 6.45 to 10.2%. It was also found

that reducing the size of the tax burden would help to reduce HE, specific the indirect taxes. The standard currency demand approach was largely criticized due to the assumption of same velocity of money for both economies (official & underground), as it creates biased estimates (over or under report) of the hidden economy (HE). So some studies attempted to correct this phenomena by setting the income velocity of circulation equal to 1 [3,4]. There are also some studies who allowed different velocities of observed and HE [8; 17, 18]. Asiedu and Stengos (2014) measured the UGE of Ghana over the period of 1983-2003 through currency demand approach of Giles. The overall level of the UGE decreased from 54% of GDP in 1985 to 25% in 1999. The average value was found to be 33% over the given time period.

In case of Pakistan, Shabsigh (1995) used Tanzi's approach with some modifications and concluded that UGE slightly declined from 21% of GDP to 20.4% in the year 1975 and 1990 respectively. But according to Yasmin and Rauf (2004) it has increased immensely from Rs. 12 billion in 1974 to Rs. 1085 billion in 2002. The same method, time path and benchmark category were followed by Kemal (2003) but with change in dependent variable i.e. currency in circulation (CC) with foreign currency accounts (FCA) to M2 as a measure of the UGE. Dummy variable was also created to capture the impact of hundi after liberalization of FCA. The inclusion of relevant variables in the model affected the significance of estimates. In the revised study of Kemal (2007) the same was proved by employing three different equations. Dependent variable kept the same but in the first equation lag of dependent variable was included as an explanatory variable, replaced with inflation in second and in the last kept both variables (lagged dependent variable and inflation) but excluded the growth rate of RGDP and tax to GDP in all the equations. Estimate of UGE as percentage of GDP were 16.3, 38.02 and 22.4 respectively in equation 1, 2 and 3.

Beside cash holdings, bearer bonds were considered to be another large source to carry out transactions in the black economy (BE). So two studies in Pakistan [2; 21] modified the Tanzi's approach and introduced ratio of currency in circulation plus bearer bonds to money supply as an attractive tool for BE. Dummy of tax reforms also included as a dependent variable with other variables. Predictive ratios were estimated with tax and without tax variables, and the difference between these two was multiplied by M2 to measure the illegal economy. Results showed the declining trend in the BE of Pakistan. It was at its maximum level when the tax rate was at its peak point and decreased during the period when the tax rate declined.

As previous approaches were largely criticized due to the inefficiency in estimating the UGE, an alternative approach was introduced by Zellner (1970) named as Multiple Indicators and Mutiple Causes (MIMIC) model and Frey and Weck-Hannemann (1984) were the pioneer of this approach. Arby et al., (2010) were the first who applied MIMIC model with monetary and consumption approach to measure the HE of Pakistan. Results showed that on average informal economy (IFE) of Pakistan in 2000's was 29 %, according to MIMIC; 23 %, according to monetary approach through Auto Regressive Distributed Lag (ARDL) and 27% when measured through consumption approach. Arby et al., (2010) study considered only one specification, but Gulzar et al., (2010) extended the MIMIC model and considered three specifications of the IFE by utilizing different economic and institutional variables. The results of the study were very similar to the study of Arby et al., (2010).

Electricity consumption (EC) was considered to be the best physical indicator of all the economic activities whether official or unofficial and first used by Kaufmann and Kaliberda (1996) to estimate the IFE. Garvanlieva et al., (2012) followed the same estimation technique to measure the shadow economy (SE) in Macedonia for the period of 2000 to 2010 and found that Tax burden, social security, regulations, and corruption level were responsible for high SE. Lacko (1998) made an attempt to compare the relative size of the Hidden Economy (HE) of 19 OECD countries through this approach. According to the results, USA, Switzerland and Norway had a relatively smaller share of the HE than other countries from 1989 to 1990. According to Kyle et al., (2001) sectoral approach showed more accurate estimates of SE that fell right after 1998 i.e. 22% of official GDP. While in 1996 it was 34% due to hyperinflation in the economy. In case of Pakistan, Arby et al., (2010) and Gulzar et al., (2010) applied this approach with other approaches to measure the HE. The only difference between the two studies was that in the second study, Gulzar et al., (2010) took the growth ratio of EC to GDP while on the other side, Arby et al., (2010) used estimated GDP data of Arby (2008), that is the only estimate of RGDP at a single base since 1970's. This method was also criticized as it creates biasedness in the estimates whenever prices of energy source increases or efficiency of the source improved [41].

In Pakistan UGE persists almost in all the sectors, whether it is manufacturing, agriculture, transport, finance or services [26]. A lot of macro-economic approaches are given to measure the size of the UGE, but the reliability of their estimates is always questioned. But none of the study has so far been made in Pakistan, where micro-based data at household level used for the estimation of the UGE. So in this study, the first attempt has been made in Pakistan in which the approach of Pissarides and Weber (1989) is followed with a little bit

modification. The main focus of the current study is to measure the size of the UGE. The contribution of the current study is to give the precise estimate of the UGE at one particular point through microeconomic approach proposed by Pissarides and Weber (1989). This approach is mainly focused on income and expenditures of the people. The General objective of the study is to measure the size of the UGE of Pakistan at a particular time period (2011-2012). The choice which motivates for this specific time period is the availability of the relevant data. To achieve this following steps are to be followed

- To check the validation of the Smith's phenomena that self-employed, under report their income and if it is true then;
- To calculate the extent of income under-reported by the self-employed.
- To measure the size of the actual gross domestic product (GDP) that is under-reported by the self-employed.

2. MATERIALS AND METHODS

This study applied Household Expenditure model introduced by Pissarides and Weber (1989). Hidden self-employed is measured through the definition of Pissarides and Weber. Characteristics of the selected groups (hidden self-employed, employees & declared self-employed) are analyzed through descriptive analysis. Two stage least square technique is applied for the coefficients needed to measure the size of hidden economy.

2.1 Data Sources

To measure the UGE of Pakistan cross sectional data is retrieved from micro dataset "Pakistan Social and Living Measurement Survey" (PSLM) (Social HIES) 2011-2012 which is provincial wise representation. The choice which motivates for this specific time period is the availability of the relevant data. Data is filtered on the basis of the household head. Two groups are selected one is employees in employment and the other is self-employed who usually run small businesses or involved in agriculture, forestry, livestock, mining, fishing etc. The sample size of the selected two groups is as follows.

Table 1: Sample Size of Selected occupational Groups in Pakistan

Groups	Frequency
Employees	6592
Self-employed	5985
Total	12577

Source: PSLM 2011-2012

The underlying measurement of the UGE the approach of Pissarides and Weber is based on two assumptions. All the groups from the population report their expenditures accurately and the group in the population who under-report their income is the self-employed. While other groups correctly report their income, especially the employees in employment. Income of households can be from different sources; wages/ salaries from employment (job), income earned from self-employment and other income (like pension, transfer payments etc.). This is the fundamental assumption of our model.

The method of Pissarides and Weber consist of two parts: In the first part, an expenditure function of food is estimated with regard to household characteristics and their reported income. In the second part, from given expenditures, income is forecasted by inverting the expenditure function. For the purpose Two Stage Least Square (TSLS) is applied.

In this study to measure the UGE the regression of consumption expenditures is running of the form:

$$C_{ij} = Z_i \alpha_j + \beta_j Y_i + \gamma_j SE_i + \eta \qquad (1)$$

Where in equation (1),

C = consumption expenditures on durable and nondurable goods, Y = income, SE = dummy for self-employed, 1 for self-employed head (if at least 25% of total income are from self-employment) and 0 for employees head (if share is less than 25 %), Z = household characteristics, α = vector of parameters, β = marginal propensity to consume good, η is the error term of the equation.

Table 1: List of variables

Variable	Description of the variable
LE	Logarithm of family expenditures
LCY	Logarithm of family Income
DSE	Dummy for self-employed, 1 for self-employed head (if at least 25% of total income are from self-employment) and 0 for employees head (if share is less than 25 %)
AGE	Age of the Head of household in years
MS	Marital status: 1= currently married, 0= otherwise
HEDU	Hhousehold head education: 0-5 years (up to primary) = 1, 6-10 year(up to metric) = 2, 11-12 years(up to intermediate) = 3, 13-14 years (up to graduation) = 4, Masters/ M. Phil. /PhD = 5, any diploma or other = 6
KIDS	Number of children between age 0-4 years
Adolescence	Number of children between age 5-16 years
GEG	Dummy for ownership of geyser electric/gas, 1 = have access, 0 = otherwise
WM	Dummy for ownership of washing machine, 1 = have access, 0 = otherwise
CR	Dummy for ownership of cooking range, 1 = have access, 0 = otherwise
HHM	Number of Household members
NROOMS	Number of rooms in house
OS	Occupancy status: 1= ownership of house, 0= otherwise
EWD	Dummy if the wife of the head is employed = 1, otherwise 0
SEWD	Dummy if the wife of the head is self-employed =1
DYE	Dummy if total income is different from total expenditures = 1, otherwise = 0
EVH	Expected value of the house

In equation (1) Y is treated as endogenous variable, so to correct the endogeneity of Y in the equation TSLS is applied.

A reduced form equation is defined as:

$$\acute{Y}_i = Z_i\delta_1 + X_i\delta_2 + \zeta_i \qquad (2)$$

In equation (2), where $\acute{Y}$ is a function of all exogenous variables in the equation and a set of instrumental variables, Y = income (from equation 1), Z = household characteristics (from equation 2), X = set of instrumental variables, ζ is the residual, this residual is the combination of three errors; variation that is unexplained in the permanent income, income deviation from permanent to actual and income deviation from permanent to reported. The variance of this residual income should be greater for self-employees than of employees.

2.3 An Estimate of the UGE

As the working assumption of Pissarides and Weber required that employees report their income accurately, then Y_i is the true income of the employee's household. Reported income and actual income are same for employees, but self-employed under report their income so their true income will be greater than reported income i.e.

$$Y_i = k_iY'_i \qquad k \geq 1 \qquad (3)$$

Where k indicates the extent of income under-reported by the self-employed. Higher the k higher will be the income under reported by the self-employed.

According to the study of Pissarides and Weber self-employed households are those, whose at least 25% of total income are from self-employment.

$$k = \gamma_j/\beta_j - \tfrac{1}{2}(\sigma^2_{YSE} - \sigma^2_{YEE}) \qquad (4)$$

The estimate from the equation (3.4) gives the lower bound of under-reporting for upper bound equation (3.5) is followed

$$k = \gamma_j/\beta_j + \tfrac{1}{2}(\sigma^2_{YSE} - \sigma^2_{YEE}) \qquad (5)$$

Where γ_j and β_j are the coefficients of equation (1) and σ^2_{YSE} and σ^2_{YEE} are the residual variances of income (from equation 2) for self-employed and employees in employment respectively.

3. RESULTS

This section is divided into three parts. In the first section descriptive analysis through tables and graphs are presented. In the second results of 2SLS are explained and in the last the amount of the UGE is measured.

Table 2: Descriptive Analysis of Employees and Self-employees

	Self-employed	Std. Deviation	Employed	Std. Deviation
Number	865		5727	
Age of Head of household(years)	41.857	11.202	42.120	10.851
Number of Children	3.247	2.491	3.051	2.482
Household Members	6.491	2.715	6.294	2.743
Family Income (annual)Rs.	205148.5	215823.4	183713.7	217297.5
Family Expenditure (annual) Rs.	250979.7	214728.2	257462.7	226070.7

Average age of individuals who concealed employment status is found to be 41. Mostly lie in the middle age and high age groups, i.e. 16 to 80. Number of children ranges up to 12 from 0. A lot of deviation is found in the income of the family that varies from 3 Thousand upto 20 Lac approximately. Average age of household head with employee status is found to be 42. Mostly lie in the middle age and higher age groups, i.e. 12 to 99. Family size is also ranges of very high value upto 33. A lot of deviation is found in the income of the family that varies from 6 Thousand upto 72 Lac approximately.

Table 3: Results of the Consumption Expenditure Equation Estimated Through Two Stage Least Square

	Unstandardized Coefficients		Sig.
	B	Std. Error	
(Constant)	4.404	0.155	0.000
AGE	0.003	0	0.000
MS	0.022	0.01	0.033
HEDU	0.047	0.004	0.000
KIDS	-0.03	0.003	0.000
Adolescence	-0.016	0.002	0.000
GEG	0.165	0.01	0.000
WM	0.106	0.006	0.000
CR	0.168	0.016	0.000
HHM	0.031	0.001	0.000
NROOMS	0.039	0.002	0.000
OS	0.017	0.004	0.000
LCY	0.073	0.034	0.031
DSE	0.023	0.008	0.003
Multiple R	0.828		
R Square	0.685		
Adjusted R Square	0.684		
Std. Error of the Estimate	0.142		

Dependent variable: logarithm of expenditures
Note: LCY and DSE1 are treated as endogenous variables. Additional instruments used in the model are EWD, SEWD, DYE, EVH, and the product of DSE with WM, OS, MS, EC, TW, MW, EWD, SEWD.

A household having ownership of gyeser has a strong positive effect on the expenditure level of that famil y. It shows that a family having gyeser have 16% higher expenditures than those who have not. It is significant even at the 1 % level of significance. Ownership of washing machine also has statistically significant at 1 % and have a positive relation to expenditures. Its coefficient indicates that expenditures will be 10%

higher for those who have a washing machine than others. Dummy for cooking range also gave positive coefficient i.e. 16% expenditures will be more of those who have cooking range than those who do not have its own. Family size is also positively related to the expenditures of the family. 1 person increase in the family member will increase expenditures by 3%. It is also significant at the 1 % level of significance. Number of rooms also have a positive significant impact on the expenditures, i.e. a family with a number of rooms assumed to have 3.9% more expenditures. Occupancy status also gave positive and significant impact on expenditures.

Marginal propensity to consume (MPC), coefficient of income for expenditures is also significant at the 5 % level of significance and is positively related. It explains that a 1 % change in income increases expenditures by 0.073%. The reason behind the minor effect of income on expenditures is that consumption expenditures are mostly related with permanent income than of reported current income level as permanent income hypothesis of Milton Friedman (1957) indicates. According to the permanent income hypothesis of Milton Friedman, people schedule their consumption expenditures on the basis of their normal income level. For the purpose, they maintain a constant living standard even though their income is changing from month to month. So, temporary change in income assumed to have little impact on expenditure level. The coefficient of self-employed dummy is significant at the 1 % level of significance. It explains that self employed is considered to have 2.3% more expenditures than of employees.

Table 4: Coefficients Used in the Estimation of the UGE (UGE)

B	γ	σ^2_{YSE}	σ^2_{YEE}
0.073	0.023	.043	.037

Here β and γ are the coefficients of income (MPC) and self-employed dummy respectively, attained from 2SLS regression. While σ^2_{YSE} and σ^2_{YEE} are the residual variances for self-employed and employees respectively. For the purpose simple regression on reduced form equation (3.4) is run separately for hidden self-employees and employees and the residual variance for both groups are taken which are given in table 4.25. The other coefficients obtained through this regression are not of significant importance, so they are not discussed here.

Now by following the approach of Pissarides and Weber, the key variable which is to be found is 'k' i.e. the extent of which reported income is to be multiplied to have the true level of income.

$k = \gamma_j/\beta_j – \frac{1}{2} (\sigma^2_{YSE} - \sigma^2_{YEE}) = 0.3120$

By taking antilog, = 2.0511, It is the lower bound of estimate k.

For upper bound,

$k = \gamma_j/\beta_j + \frac{1}{2} (\sigma^2_{YSE} - \sigma^2_{YEE}) = 0.318068$

By taking antilog, = 2.08, This is the upper bound of estimate k.

However the difference between the lower bound and upper bound is very small. So this estimate is interpreted as that the reported income of self-employed is to be multiplied by the number 2.08 to have the true level of income. It means actual income of self-employed is 1.08 times of their reported income.

3.1 Measurement of the Size of the UGE

To measure the actual size of the UG or hidden economy the estimate obtained in the previous section, i.e. 'k' is used as follows.

The population who concealed their employment status (i.e. hidden self-employed) is 13.1% of the selected sample. So, self-employment income amounts to be almost 13.1% of official gross domestic product (GDP). Thus the estimates obtained in the study imply that the size of the UGE is 14.148 % of the reported official GDP. It is calculated as follows:

K = 2.08, Hidden self-employed = 13.1%

Here k implies that income of self-employed is 1.08 times more of the reported income. So,

$1.08 \times 13.1\% = 14.148\%$

The reported GDP of Pakistan in the year 2012 was 20090.862 Billion $ [International Financial Statistics]. So the actual GDP for the year 2012 was

Actual GDP = reported + hidden

where hidden GDP = 14.148% $\times$ 20090.862 = 2842.455 Billion

Actual GDP = 20090.862 + 2842.455

= 22933.317 (Billion)

According to the results almost 2842.455 billion (14.148% of GDP) is under-reported by the self-employed. However the results obtained from this study under-estimate the size of the hidden part of the

economy. This might be due to the reason that this approach does not include illegal or criminal activities such as gambling, drugs and prostitution [Fortin et al., 2010].

4. DISCUSSION

No precise measurement of the UGE has been found that could be considered to give the true and reliable estimates of its size and trend. In literature a lot of approaches are found which are specifically designed to measure this unreported economic activity of a country. But all the approaches are subsequently criticized due to one or another reason. In this research work, an attempt has been made to measure the size of the underground/hidden economy through the approach presented by Pissarides and Weber (1989) which is a micro-based approach. For the purpose, the present research has been carried out to measure the size of the UGE of Pakistan by using cross sectional data of PSLM survey 2011-2012.

According to the approach, which is used in the study, income is largely concealed from the self-employed individuals. By self-employed here it means those who show themselves as employees, but earning at least 25 percent of their total income from self-employment. So, according to this approach all the hidden parts of the economy are circulating around the hidden self-employees. For the purpose, Two Stage Least Square (2SLS) techniques is applied. Required coefficients needed to calculate the size of the hidden part are derived from the results of 2SLS.

According to the results, the income which is under-reported is 1.08 times of the reported income of hidden self-employees and hidden self-employed are 13.1% of the selected sample. It means earnings from self-employment (those who are hidden) amounts 13% of GDP. So the measured hidden part is 14.148% of the official (reported) GDP for the year 2012. The results of the study give a precise value of the economic activities that are working in the underground activities. The reason behind this limited value is that this method for measuring UGE activities does not include any illegal activity that are forbidden by the law like gambling, drug dealings etc.

5. Conclusion

To overcome this scenario and to make this hidden part unhidden government should review the policies relating to developmental programs in the public sector. Although there are very limitations and hurdles that policy makers faced because the actual size of the economic activities is understated, thus leading to the wrong implication of the policies.

This study does not aim to eradicate the problem of UGE because the issue is associated with the political parties and law enforcement agencies. But this study may help them to know the true level of the economy. But some suggestions may be given as:

- Government should make ensure the well documentation of all the running activities and transactions.
- Adoption of plastic money i.e ATM/credit cards than cash transactions could improve the situation.
- Policies to increase the registration of people in tax system should be adopted.

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