ARTICLE REVIEW: Underground Economy

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The article "The Underground Economy" by Georgiou & Syrichas (1994) to overview and estimate the black economy through the case study of Cyprus. The article was submitted for publication in *Cyprus Journal of Economics* by Georgiou and Syrichas in December, 1994. According to Georgiou & Syrichas (1994), black (underground) economy includes all activities which are either not recorded or underreported by individuals or the government for the purpose of evading taxes. The paper first explains three macroeconomics approaches which are usually used to estimate the black economy. Second, these approaches are used to calculate the estimates of Cyprus economy. The method utilized in the estimation was first employed by Tanzi and applied to the U.S. data. In order to accomplish this objective, the paper uses time series data from 1960 to 1990. The results have showed that the value of the underground economy is between 3% and 10% of the gross domestic product (GDP) (Georgiou & Syrichas, 1994).

Summary of Range, Concepts and Arguments

The main objective of the article under consideration is to employ the estimation procedure first used by Tanzi in his research devoted to the U.S. black economy in order to evaluate the similar black activities in

Cyprus. This paper classifies black economy into two broad categories which include income versus expenditure measures and the measures based on money. The first theory relies on the fact that the difference between the national expenditure and national income takes place as a result of black activities, assuming that the expenditure is more than the income and that there is no other applicable explanation of this discrepancy. The monetary theory approach employs cash ratio method which examines money movement as a consequence of underground activities and monetary transaction method which considers all the monetary activities in a state.

The main Tanzi's concept used in the article is based on the assumption that the economy agents take part in the underground economy. If this assumption is true and the demand for currency is a function of inter alia taxes, the estimates of tax elasticity can be used to determine the stock of currency, a consequence of the underground activities. In this case, according to Tanzi, the dependent variable is the currency ratio to M2. On the other hand, the model's independent variables include per capita income, wage-salary ratio, and the interest rate calculated on the deposits. It is hypothesized that an increase in per capita income leads to a decrease in the currency ratio, while the salary-wage ratio is positively correlated with the currency ratio.

Critical Discussion

According to Holz, Engelberth, & Freiling (2009), the effect of black

economy accounts for over 30% of the total errors in the calculation of the country's GDP. Also, underground activities often lead to overestimation or underestimation of the unemployment and inflation national figures. Besides, underground activities can lead to a reduction of the tax revenue thus imposing a deficit on the state budget. Therefore, it is evident that these underground activities have a direct negative effect on the country's economy. According to Holz, Engelberth, & Freiling (2009), the first step in combating these activities is an accurate estimation of the total income lost.

There are several issues which are raised in the article. Firstly, the author uses monetary ratios of the economy which is recorded as an estimate of econometric value. The results obtained during this step are used in estimating the stocks, which are a consequence of the black economy. These estimates are then multiplied by the velocity of circulation of money to obtain the size of the black economy. In accomplishing this, the author uses a linear relationship model of income tax, state income, the value of wages and salaries, and per capita income to estimate the value of the currency ratio which is a dependent variable.

According to Holz, Engelberth, & Freiling (2009), underground economy should not be linearly modeled. Furthermore, the wages and salaries do not have a direct relationship with the underground economy since they are captured in the country's expenditure basket (Holz, Engelberth, & Freiling, 2009). Therefore, the author should not have used the linear relationship. Instead, a generalized model with confounding variables would have produced more accurate estimates. This generalization is

also found in the Tanzi's estimation, where the author uses a linear estimation combined with some assumptions.

Secondly, Georgiou & Syrichas (1994) run several models with different combinations of the independent variables finally employing the most accurate model. The model which showed the fewest deviations had the semi-log transformation of the dependent variable (currency ratio) which was estimated at C/M2. This model produced a standard error of 0.0343 and an F value of 12.27 yielding a p-value of 0.000 (Georgiou & Syrichas, 1994). Also, 77.82% of the variability in the dependent variable was explained by the model (R^2=0.7782), and the Chi-Square test of independence gave a Pearson's Chi-Square value of 1.0972 (Georgiou & Syrichas, 1994). The model with the logarithm transformation of C/D as the dependent variable yielded a standard error of 0.062 with an F value of 13.178 (Georgiou & Syrichas, 1994). Also, the value of correlation coefficient was 0.7756 which implies that 77.56% of the variability in the dependent variable is explained by the model (Georgiou & Syrichas, 1994). Lastly, the Chi-Square test of correlation yielded a Pearson's Chi-Square coefficient of 1.3482.

The above argument of model selection is very accurate since the authors indeed selected the best model. According to Holz, Engelberth, & Freiling (2009), the best estimate is given by the model with the largest value of the coefficient of correlation and the least error (standard error). From the above results, the first model has a standard error of 0.0343 which is smaller than that of the second model which is 0.062. Also, correlation coefficient for the first model is 0.7782, and it is larger than that of the first model which is 0.77.56. Therefore, the first model

provides the best estimate. The results from the first model indicate that from 1960 to 1990, the lowest value of underground economy was 2.7% of the total Cyprus economy (over CYP 3.0 million), and the highest value was 10.3% of the Gross National Product (GNP) of Cyprus economy (over CYP 230 million).

Final Evaluation

The reviewed article has a great impact on my understanding of the topic of the underground economy. First, I have learned the effects of the underground activities to the economy. Secondly, I have got to know that black economy can be accurately estimated contrary to a widespread belief that this economy cannot be evaluated properly due to the lack of supporting data and documents. Generally, the article under consideration has greatly contributed to the Cyprus economy and state in general. It has provided a framework which can be used by Cyprus state to estimate and curb the black activities. Reducing these activities might lead to an increase of the revenue tax collected. Lastly, the article is well-organized and informative: it is divided into several sub-sections, making it easier for the readers to follow up the arguments. The author's style of writing is very straight and clear.

In conclusion, it is clear that underground economy accounts for a significant part of the country's GNP. The report has revealed the most accurate method of estimation of this economy. Therefore, the government and the economic agencies should take appropriate

measures in reducing these activities so as to increase the value of the income tax.