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AN ANALYSIS OF THE SHADOW ECONOMY IN MALTA

BOX 1: AN ANALYSIS OF THE SHADOW ECONOMY IN MALTA¹

The shadow economy is a complex phenomenon, difficult to define and measure, with far-reaching effects on the economic and social life of a country. Studies indicate that the shadow economy leads to the inefficient functioning of the goods and labour markets with detrimental effects on overall economic activity and welfare. It also negatively affects government revenue, thereby reducing the quality and quantity of expenditures on public goods. On the other hand, the shadow economy creates an extra added value that can be spent in the official economy. It may also act as an employer of last resort in recessions.

Studies aimed at measuring the size of the shadow economy are inherently surrounded by uncertainty given that – by its very nature – there is no observable data on the shadow economy. Moreover, there is no consensus on how to define this complex economic phenomenon. This problem is even more pronounced since the list of activities that should be included in the measurement of the shadow economy seems to be quite distinct across the different fields of social sciences. The broad definition followed in this study, which is in line with other macroeconomic studies, refers to those activities which are productive and legal but are deliberately concealed from public authorities to avoid taxation and having to meet certain legal standards.²

Over the years, several methods have been developed with the aim of estimating the size of the shadow economy. This study presents results for the size of the Maltese shadow economy based on two distinct methods: the currency demand approach and the Multiple Indicators Multiple Causes (MIMIC) model.

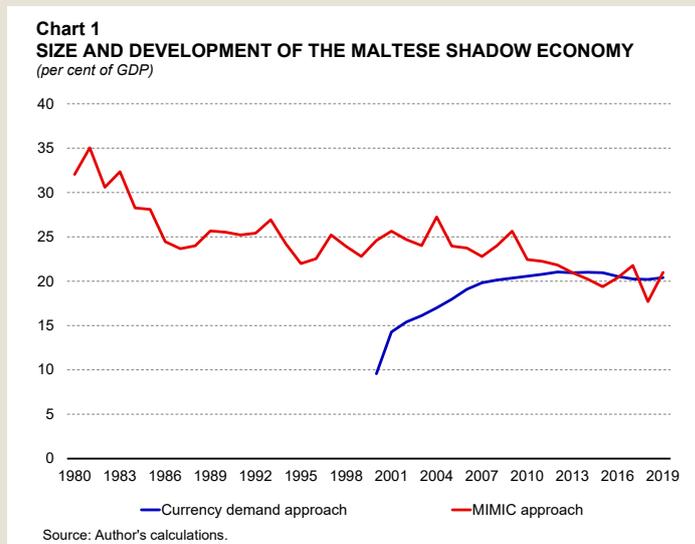
The currency demand approach

The currency demand approach is one of the most simple and commonly used methods in empirical analysis. In this approach, movements in narrow money are used to infer the scale of activity in the underground economy. The premise behind this approach is that since hidden transactions occur mainly in cash, an increase in currency demand signals an increase in the underground economy. The estimation of the size of the underground economy can be broadly divided into three parts. The first involves fitting an equation for currency demand. Exogenous variables in this equation include variables which explain structural motives for holding currency and variables which are meant to explain “excess holdings” of currency related to the underground economy, typically subsumed in the tax burden. The second part of the exercise requires finding the “excess” currency demand, while the third part links the “excess” currency in circulation to underground economic activity.

¹ Prepared by Tiziana M. Gauci, Senior Research Economist within the Research Department of the Central Bank of Malta. More details about the study summarised in this Box are found in: Gauci, T. M., and Rapa, N. (2020), “An analysis of the shadow economy in Malta: A Currency Demand and MIMIC model approach”, Central Bank of Malta *Working Paper* WP/02/2020. The views expressed in this Box are the author’s own and do not necessarily reflect the views of the Central Bank of Malta. Any errors are the author’s own.

² This definition of the shadow economy excludes illegal activities, defined as productive activities that generate goods and services that are forbidden by law or are unlawful when carried out by unauthorised persons, and informal activities carried out by individuals and small enterprises which are difficult to measure formally. Moreover, throughout this study the terms “underground economy” and “shadow economy” are used interchangeably and refer to the same concept defined above.

Results for the relative size of the Maltese shadow economy over the period 2000 to 2019 based on this approach are shown in Chart 1. The currency demand model suggests that the size of Malta's underground economy registered an increase after 2000 and in the run-up to Malta's accession to the European Union but remained broadly stable since then, averaging at just below 21% of GDP over the last decade.



While the currency demand approach is relatively easy to follow, it builds upon simplifying assumptions that do not necessarily hold in real life. For instance, the method relies on the assumption that all underground economic activity is paid for in cash, implying that currency in circulation can be thought of being the only indicator of the shadow economy. Moreover, this method assumes that the tax burden is the only determinant behind the existence of the shadow economy. In actual fact, literature suggests that there are also other reasons behind the existence of a shadow economy, as well as a number of indicators that could help detect its size, such as the complexity of the tax system, the size of the public sector and the share of self-employed in the labour force.

MIMIC model

The MIMIC model, which is a special type of structural equation model (SEM), is usually considered as potentially superior to the currency demand approach because of its ability to simultaneously consider several causes and indicators. In this model, the shadow economy is considered as a latent variable which is caused by an array of observable exogenous factors. The model is estimated using annual data from 1980 to 2019 using maximum likelihood estimation.

According to this model, the determinants considered in this study – the tax burden, recurrent government expenditure, the self-employment rate and the unemployment rate – all have positive coefficients, indicating that a rise in each of the variables is reflected by a rise in underground activity. Results also show that the share of self-employed in the labour force has the largest effect on the shadow economy in Malta.

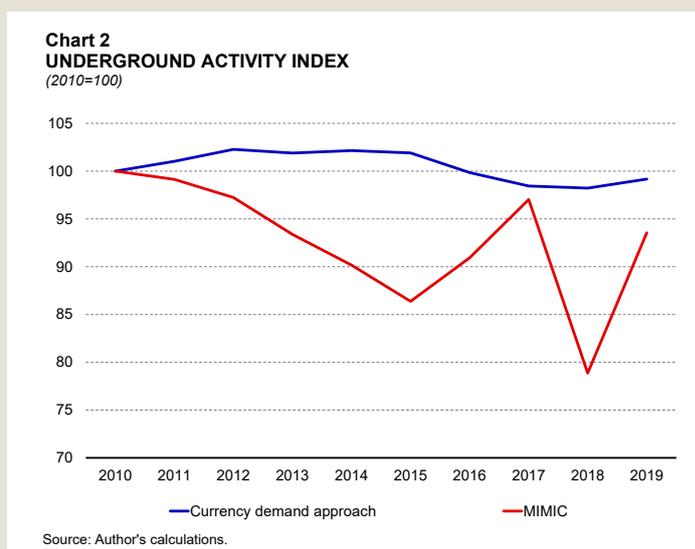
Latent variables estimated within a structural econometric modelling approach do not have a natural scale. As normally done in literature, the results obtained from the currency demand model are used to benchmark the fitted latent variable. In this case, the estimate of

the underground economy for 2013 is taken as the benchmark, such that the underground economy is equal to 21.0% of GDP in both methods.

The results indicate that, in general, the underground economy fell steadily relative to measured GDP over the period 1980 to 2019. The value of the underground economy fell from about 32% of GDP in the early 1980s to about 21% in 2019 (see Chart 1). This method indicates that since 2000, the shadow economy averaged 23%. The downward trend in Malta's underground economy, as measured by the MIMIC approach, has occurred in a period which was characterised by an increase in Malta's trade openness, as well as by a rapid increase in its GDP per capita, corroborating two stylised facts found in the literature.³ Like any other econometric model, the MIMIC model is also known to have a number of shortcomings. Defining the shadow economy is a challenge given that it is a latent variable, while the choice of variables can also raise questions. It is also possible that the causal variables employed are also driving forces for illegal activities and do-it-yourself activities, meaning that the 'true' shadow economy estimates may be inflated. Moreover, it may be difficult to determine whether a variable is a cause or an indicator of underground activity. For instance, the unemployment rate is usually regarded as a causal variable leading to the development of the shadow economy. At the same time, the unemployment rate can be regarded as an effect of the existence of the shadow economy in a certain country. These factors, together with other econometric issues regarding the estimation and normalisation of MIMIC models, further highlight the uncertainty surrounding these results.

Developments over the period 2010-2019

The level of the underground economy in the MIMIC approach is very sensitive to the point at which the benchmarking technique outlined above is performed. In this light, results relating to the level of the underground economy need to be interpreted with caution, particularly in respect of the absolute size of the underground economy relative to GDP. Attention should be more focused on the dynamics of the estimated results. In view of this, and to make comparisons easier, Chart 2 shows the two measures of the underground economy estimated in this study for the period 2010-2019,



³ See Kelmanson B., Kirabaeva K., Medina L., Mircheva B. and Weiss, J. (2019), "Explaining the Shadow Economy in Europe: Size, Causes and Policy Options." International Monetary Fund Working Papers 19/278 and Torgler, B., and Schneider, F. (2007), "What shapes attitudes toward paying taxes? Evidence from multicultural European countries", *Social Science Quarterly*, 88(2), pp. 443-470.

with 2010 taken as the base year and indexed to 100. Both models suggest that the size of the shadow economy in Malta has remained relatively stable over the last decade. The index based on the currency demand approach indicates that the underground economy has remained practically unchanged since 2010. On the other hand, estimates from the MIMIC model indicate a downward trend in the size of the underground economy with the index falling by around 6% over the period.

Conclusion

Given the unobservable nature of the shadow economy, these estimates are surrounded by a degree of uncertainty, making them an approximation of the true size of the shadow economy rather than a precise measure. Consequently, economic policies arising from such estimates should be formulated cautiously and with a full understanding of the models' limitations. Crucially, while it is possible to gain information on the most important factors that influence the trends and dynamics of the shadow economy, it is indeed much harder to elicit information on the level of underground economic activity.