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A NEW MEASURE OF HOUSEHOLD DISPOSABLE INCOME FOR MALTA

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A NEW MEASURE OF HOUSEHOLD DISPOSABLE INCOME FOR MALTA¹

Household disposable income is the income available to households for consumption or saving. In other words, it is the income households receive from all sources – such as income deriving from employment, be it in the form of compensation received by employees or income from self-employment; net investment income, that is interest payments and dividends deriving from financial assets, less interest paid; cash payments received through social transfers; and income coming from the rental of property – less the total taxation households pay on the different sources of income. This includes taxes on employment income, such as income taxes paid by households and national insurance contributions paid by employees and the self-employed, taxation on investment income and taxes on rental income.

Disposable income is a key macroeconomic variable, particularly within the context of the Keynesian absolute income hypothesis, which asserts that private consumption is a function of disposable income.^{2,3} Economic theory, therefore, suggests that disposable income can explain consumption behaviour, a claim that has been supported by several empirical studies.^{4,5} Moreover, a reliable measure of disposable income is central to accurately gauging the household saving rate.⁶ The latter has important macroeconomic implications, particularly for the funding of investment spending, which, in turn, is a critical driver of long-term growth. The saving rate also sheds light on how well equipped households are to deal with economic shocks, such as adverse labour market conditions, and their ability to provide themselves with pensions and healthcare rather than depending on the state.

Existing measures of household disposable income for Malta: a stocktake

Despite its importance, official data on disposable income in Malta with the desired frequency, span and timeliness are unavailable. While the Maltese national accounts do provide data on disposable income up to 1999, thereafter readings for this series are not publicly available.⁷ One source for data on disposable income is the Survey on Income and Living Conditions (SILC) published by Malta's NSO. However, this survey is only conducted on an annual basis and is available with a considerable lag. Moreover, the survey is rather recent and data are only available over the 2005-2010 period. Another source is the Household Budgetary Survey (HBS), also issued by

¹ Prepared by Owen Grech. Mr Grech is a Senior Research Economist in the Bank's Modelling and Research Office and a Visiting Assistant Lecturer at the University of Malta's Faculty of Economics, Management and Accountancy. He would like to thank Prof. Josef Bonnici, Mr Alfred DeMarco, Dr Bernard Gauci, Dr Aaron Grech and participants at an internal research seminar for valuable discussions, comments and suggestions. The views expressed are those of the author and do not necessarily reflect the views of the Central Bank of Malta. Any errors are the author's own. Email address: grecho@centralbankmalta.org.

² In this article, "household disposable income" and "disposable income" are used interchangeably, as are the terms "household saving rate" and "saving rate".

³ See Keynes, J. M., *The General Theory of Employment, Interest, and Money*, London, Macmillan, 1936.

⁴ See, for example, Fagan, G. and Morgan, J., "An Overview of the Structural Econometric Models of Euro-Area Central Banks", in Fagan, G. and Morgan, J. (eds.), *Econometric Models of the Euro-Area Central Banks*, Edward Elgar, 2005, pp. 1-49.

⁵ Other important developments in this field were the life-cycle hypothesis developed by Modigliani and Brumberg and the permanent income hypothesis put forward by Friedman, which suggest that economic agents do not base consumption decisions solely on current income, but rather on expected lifetime resources. See Modigliani, F. and Brumberg, R., "Utility Analysis and the Consumption Function: An Interpretation of Cross-Section Data", in Kurihara, K. (ed.), *Post-Keynesian Economics*, New Brunswick, New Jersey, Rutgers University Press, 1954, pp. 388-436, and Friedman, M., *A Theory of the Consumption Function*, Princeton, New Jersey, Princeton University Press, 1957. In fact, empirical studies show that both current income and expected lifetime resources explain private consumption. Again, see Fagan, G. and Morgan, J., "An Overview of the Structural Econometric Models of Euro-Area Central Banks", in Fagan, G. and Morgan, J. (eds.), *Econometric Models of the Euro-Area Central Banks*, Edward Elgar, 2005, pp. 1-49.

⁶ The household saving rate is household saving expressed as a percentage of household disposable income, where household saving is calculated by deducting private consumption from household disposable income. Saving rates may be measured on a gross or on a net basis. Net saving rates are calculated by subtracting depreciation from saving and from disposable income. The saving rates presented here are all gross saving rates and thus do not take the effect of depreciation into account.

⁷ A discussion of the saving rate in Malta between 1970 and the late 1990s can be found in Grech, A. G., "The Private and Public Saving Gaps in Malta and their Impact on the Current Account", *Quarterly Review*, 33(1), Central Bank of Malta, 2000, pp. 51-61.

the NSO, which, however, only provides readings for 2000 and 2008, and is also published with a significant lag.

The absence of the necessary disposable income statistics narrows the range of research that can be conducted on the domestic economy. This article proposes a new measure of disposable income for Malta to promote further work in this regard and to broaden the research questions that can be tackled. Indeed, the development of this measure stemmed from the need to construct a consumption function that explains domestic private consumption behaviour within the broader context of building a new macro-econometric model of the Maltese economy.⁸ The rest of this article sheds light on the methodology behind this measure and analyses the new data on disposable income and the saving rate that emerge.

The anatomy of the new measure of household disposable income for Malta

The new measure of disposable income is defined as:

$$ypd = yempnet + selfempinc - taxempinc + socbenc + invinc + imprents$$

where: ypd = household disposable income

$yempnet$ = compensation of employees net of national insurance contributions paid by employers and imputed government national insurance contributions in respect of its own employees.

$selfempinc$ = income of the self-employed

$taxempinc$ = taxes on employment income

$socbenc$ = social benefits received in cash

$invinc$ = investment income

$imprents$ = imputed rents

Households, therefore, are assumed to receive three distinct types of income: income from employment, which can take the form of compensation received by employees or income from self-employment, social security cash payments, and income earned from financial assets.⁹ Households pay one type of taxation, namely taxes on employment income.

The frequency of the measure is quarterly. It spans from 2000Q1 to 2013Q3 and can be updated regularly as new data become available. It draws from a multitude of data sources and is constructed using data that are largely publicly available. Whenever quarterly data were unavailable, data of a different frequency were converted into quarterly observations. For all data, the latest vintage was used which, in the case of national accounts data, was the 2013Q3 vintage. We now turn to discuss how the individual components of the measure of disposable income were constructed.^{10,11,12}

⁸ See Grech, O., Micallef, B., Rapa, N., Grech, A. G. and Gatt, W., "A Structural Macro-Econometric Model of the Maltese Economy", *Working Paper* No. 02/2013, Central Bank of Malta.

⁹ Another item on the receivable side is imputed rents. Although not strictly a form of income, imputed rents should feature as part of disposable income, nonetheless, as shall be explained further on.

¹⁰ The methodology employed generally observes international statistical conventions, for example as laid out in European Commission, International Monetary Fund, Organisation for Economic Co-operation and Development, United Nations and World Bank, in *System of National Accounts 2008*, New York, 2009.

¹¹ All data used and presented are in nominal terms.

¹² Throughout, whenever values are converted into euro, all conversions are based on the historical exchange rate rather than the constant conversion rate of €1 = Lm0.4293 used for reporting purposes, since the former captures more accurately what the Maltese lira was worth in euro terms during the period prior to euro adoption.

Net compensation of employees – Compensation received by employees is a major source of income for households. The National Accounts provide data for total compensation of employees, which consists of gross wages and salaries payable by employers to employees, as well as total employers' national insurance contributions. Since the latter do not constitute disposable income received by households, they must be deducted from the total figure for compensation of employees when measuring disposable income. Total employers' national insurance contributions consist of actual and imputed contributions. Annual data on actual employers' national insurance contributions were taken from tax revenue releases published by the NSO and converted to quarterly data using government cash data. Imputed employers' national insurance contributions represent the current accruing cost of future pension obligations to current government employees.¹³ Quarterly data for this variable were obtained from the NSO's Quarterly Accounts for General Government.

Gross wages and salaries also include national insurance contributions and income taxes paid by employees, which should also be removed since they do not represent disposable income. These taxes, however, are captured under the taxes on employment income component of the disposable income measure and are thus deducted at a later stage. Therefore, the net compensation of employees category refers to income received by employees net of actual and imputed national insurance contributions paid by employers, but not of national insurance contributions and income taxes paid by employees.

Income of the self-employed – Employment provides households with another important source of income, that coming from self-employment. The only data on the income of the self-employed available to the author were survey data, the most comprehensive of which are collected under the SILC. Although these data only cover a span of six years, they were used to produce an estimate of income from self-employment over the entire 2000Q1-2013Q3 period. This was done by using the six annual observations on the income of the self-employed to estimate its share in GDP. This was found to be slightly above 7.0%, on average. This ratio was then applied to the quarterly series of GDP to extract an estimate of income from self-employment in each quarter. This source of income was tied to GDP because the income the self-employed receive is likely to be closely linked to national income and to exhibit a pattern that mirrors the business cycle. During an economic upturn, there is a heightened demand for goods and services, and therefore the income of the self-employed is expected to increase. The opposite holds true during a downturn. The income of the self-employed is estimated on a gross basis and therefore national insurance contributions and income taxes paid by the self-employed have to be deducted, but this is done through the taxes on employment income component to which we now turn.

Taxes on employment income – The income households earn from employment, namely compensation of employees and income from self-employment, is measured on a gross basis and thus includes both national insurance contributions and income taxes paid by households. These taxes have to be deducted since they do not form part of disposable income. There are three types of taxation that households pay on employment income: national insurance contributions paid by employees, national insurance contributions paid by the self-employed, and income taxes paid by both employees and the self-employed. Tax revenue releases published by the NSO were the source of annual data on all three forms of taxation, which were then converted to a quarterly frequency using government cash data.

Social benefits received in cash – Disposable income also depends on social security cash payments received by households. These represent cash transfers, such as pensions and unemployment benefits from Government to eligible households. Social benefits received in kind, such as free medicines, are excluded from disposable income since they do not affect the income available to

¹³ For further details see, *Government Finance Statistics Guide*, ECB, Frankfurt am Main, March 2010.

households for consumption or saving. The source of quarterly data on social security cash payments is the NSO's Quarterly Accounts of General Government.¹⁴

Investment income – Another source of income for households is net inflows deriving from financial assets. These consist of interest payments and dividends earned on investment assets, such as deposits, bonds and stocks after deducting the interest paid by households.¹⁵ Investment income may be locally-earned or foreign-earned. The same applies for interest paid. At an aggregate level, data on net investment income earned by households are not available. Therefore, to construct this component of disposable income, a disaggregated approach had to be adopted.

One of the major sources of investment income for Maltese households is net interest receivable from domestic banks, that is, interest received on deposits held with domestic banks less the interest paid on loans from these same banks. Interest earned on deposits was obtained by multiplying the stock of deposits held by resident households by the weighted average deposit rate on household deposits. From this inflow, the interest paid on loans was deducted. Similarly, this was calculated by multiplying the stock of loans to resident households, distinguishing between mortgages and consumer and other credit, by the respective weighted average lending rate applicable to households.¹⁶ The Central Bank of Malta is the source of all these data.

Another important source of investment income for domestic households is interest received on bonds issued by the Maltese Government. To calculate the coupon payments households receive from these bonds, detailed data on the stock of Malta Government Stocks (MGS) were used. The data list on a quarterly basis the stock of all individual MGS still outstanding, and, for each of these individual bonds, the coupon rate and the dates when the coupon payments are payable. The stock of MGS, however, captures the total stock issued, rather than the portion held by households. Data revealing the share of each individual bond held by households are not available. However, aggregate data showing the share of the total outstanding stock held by households on a quarterly basis are available. Therefore, for each quarter, the stock of each outstanding individual bond was multiplied by this aggregate share to arrive at an estimate of the portion of that particular bond issue held by households.¹⁷ To find the coupon payments received by households in a particular quarter, the estimates of the stocks held by households in the previous quarter were used since the coupon payments received in a given quarter depend on the stock of bonds held at the end of the previous quarter. The estimate of the stock held by households of those individual bonds paying a coupon in the following quarter was multiplied by that bond's coupon rate and then halved, since MGS pay semi-annual coupons.¹⁸ These individual coupon payments were then added to find the total coupon payments received by households in the following quarter. For example, to obtain the coupon payments received in 2000Q1, bonds held by households as at 1999Q4 and making a coupon payment in 2000Q1 were considered. Again, all the required data are collected by the Central Bank of Malta.¹⁹

¹⁴ The Quarterly Accounts of General Government releases provide data on total social security payments, without distinguishing between those paid in cash and those given in kind. This split was kindly provided separately by the NSO.

¹⁵ Note that capital gains or losses do not form part of disposable income.

¹⁶ Publicly available data on the weighted average deposit rate on household deposits and the weighted average lending rates applicable to households are only available as from 2008Q1. These data were extended backwards to 2000Q1 using similar series.

¹⁷ Data on aggregate shares only go back to 2003Q4. For the period covering 1999Q4 to 2003Q3, the shares taken are the author's own estimates based on trends in the data.

¹⁸ Since 2009Q4, the Government has also been issuing floating rate bonds that have a variable coupon rate equal to the six-month EURIBOR in effect a few days before the coupon date, plus a spread. The details of these bonds were obtained from their prospectus issued in the *Government Gazette*.

¹⁹ Households also receive interest on domestic Treasury bills. This, however, is excluded from the measure on the basis of its insignificance. For example, as at the end of December 2012, households accounted for less than 1.0% of the total outstanding stock of domestic Treasury bills.

Net interest receivable from domestic banks and interest earned on Maltese government bonds are not the only sources of locally-earned investment income. Households also earn income from domestic corporate bonds and shares. Moreover, they receive foreign-earned investment income. However, the statistics required to calculate the income deriving from these other sources are unavailable. Therefore, in the absence of these data, households are assumed to have two sources of investment income: net interest on deposits and loans, and coupon payments received from bonds issued by the Government of Malta.²⁰ Although this estimate does not capture all sources of investment income, the two sources considered are likely to account for a significant proportion of overall investment income.

Imputed rents – The final component in the new measure of disposable income is imputed rents. Imputed rents represent an estimate of the value of housing services households derive from owner-occupied housing. Put differently, they are an estimate of rent households would have paid had they rented the property they occupy. Although imputed rents are not strictly a form of income received by households, they still form part of disposable income. One may recall that disposable income is the income available to households for consumption or saving. On the consumption side, imputed values for rents are included although they do not represent actual expenditure by households. These imputed values on the consumption side must be matched on the income side. There must be some “inflow” to fund this “outlay”, which is why imputed rents feature as part of disposable income.²¹ Annual data on imputed rents were obtained from Eurostat and then converted to a quarterly frequency using National Accounts data on output by the Real Estate Activities sector provided by the NSO.

This new approach to constructing disposable income produces a raw series that implies unreasonably low saving rates. In large part, this is likely to be due to under-reported incomes and also as a result of sources of income that are absent from this measure due to data unavailability, such as certain forms of investment income and rental income. With this in mind, disposable income was calibrated to produce a saving rate of 6.4% in 2000, a result that emerges from the HBS for that year, and the calibrating factor was applied to the entire series.²² This raises the entire profile of disposable income, and hence the saving rate series, uniformly, with the dynamics of the original series remaining intact. This article, therefore, does not seek to shed light on the level of disposable income or the level of the saving rate, since these are conditional on the choice of calibration. Instead, it discusses the *growth* in disposable income and *changes* in the saving rate, since these are not sensitive to calibration.

Assessing the new data on household disposable income and the household saving rate

Chart 1 shows the composition of the new measure by displaying the share of the individual components in disposable income for each of the years between 2000 and 2012.²³ The shares suggest that the most important source of income for households is net compensation of employees, which accounts for 69.8% of disposable income, on average. Other major sources of income are social security cash payments and income from self-employment, which represent, on average, 21.1% and 12.1% of disposable income, respectively. With an average share of 14.9%, taxes on employment income also have an important bearing on disposable income. The component with the lowest relative importance is investment income, which has a rather low average share of 2.9%. In relative terms, the shares of net compensation of employees, income from self-employment and imputed rents are rather stable over time, while the shares of taxes on employment income and social security cash payments rose

²⁰ Due to data unavailability, investment income is not measured net of taxation.

²¹ In other words, “if imputed values are added to housing consumption, there must be a resource inflow to ‘finance’ the additional consumption. This is achieved by adding imputed net rentals on the income side”, as explained in Eurostat, “The Distributional Impact of Imputed Rent in EU-SILC”, *Methodologies and Working Papers*, Luxembourg, 2010, p. 9.

²² Although other calibration options were available, we chose to calibrate using the results of the HBS for 2000 because it produced, in our view, the most plausible saving rates.

²³ For brevity, annual figures are presented throughout. Quarterly data are available from the author on request.

notably. Investment income witnessed the most substantial change in share, which fell from 6.3% in 2000 to 1.0% in 2012, largely as a result of the international decline in interest rates. On average, close to 90.0% of the series for disposable income is based on official data, as opposed to estimated data.²⁴

Table 1 presents the annual growth rates of nominal disposable income, along with a decomposition of the growth rates by contribution of the individual components of disposable income.²⁵ It also

shows nominal private consumption growth and the saving rate. Disposable income grew by 3.4% annually, on average, over the period covering 2000 to 2012, with much of this growth being driven by net compensation of employees. It is possible to distinguish between four distinct periods in the evolution of disposable income growth over this span. As can be seen from Chart 2, between 2002 and 2005 disposable income grew moderately, before growing strongly over the 2006-2008 period. This pick-up in growth was largely brought about by developments in net compensation of employees and investment income. In 2009, as a result of the global financial crisis, disposable income growth slowed considerably, again mirroring developments in net compensation of

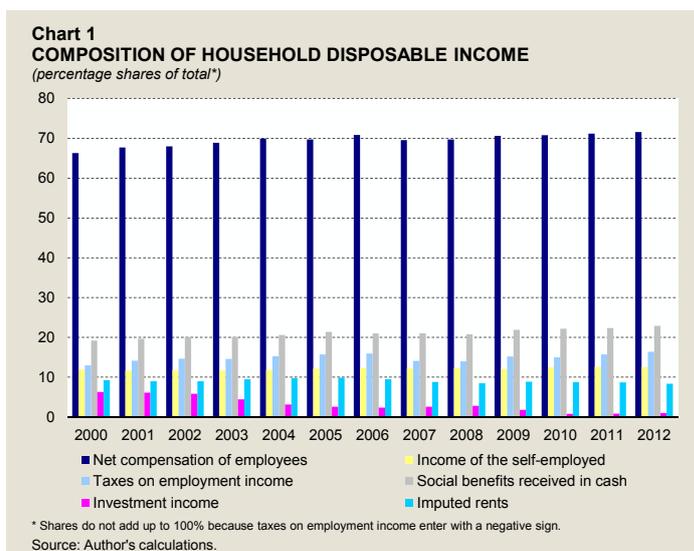


Table 1

**HOUSEHOLD DISPOSABLE INCOME GROWTH AND CONTRIBUTIONS TO GROWTH,
PRIVATE CONSUMPTION GROWTH AND THE HOUSEHOLD SAVING RATE**

Per cent; percentage points

	Household disposable income	Net compensation of employees	Income of the self-employed	Taxes on employment income	Social benefits received in cash	Investment income	Imputed rents	Private consumption	Household saving rate
	%	p.p.	p.p.	p.p.	p.p.	p.p.	p.p.	%	%
2000									6.4
2001	5.1	4.9	0.3	-1.9	1.4	0.2	0.2	2.8	8.4
2002	2.5	1.9	0.4	-0.9	1.0	-0.2	0.2	0.3	10.3
2003	-0.1	0.8	0.0	0.1	0.0	-1.4	0.5	1.1	9.2
2004	0.0	1.1	0.1	-0.6	0.5	-1.3	0.3	2.9	6.6
2005	2.5	1.5	0.7	-0.9	1.3	-0.5	0.3	4.2	5.0
2006	5.1	4.8	0.7	-1.0	0.7	-0.1	0.1	6.2	4.1
2007	7.7	4.1	0.9	0.7	1.7	0.4	0.0	2.9	8.4
2008	6.4	4.6	0.8	-0.8	1.0	0.5	0.2	7.5	7.4
2009	1.4	1.9	0.0	-1.4	1.4	-1.0	0.5	3.3	5.6
2010	3.4	2.6	0.9	-0.3	1.0	-1.0	0.2	2.8	6.2
2011	3.0	2.5	0.5	-1.2	0.9	0.1	0.2	4.2	5.0
2012	3.6	3.0	0.4	-1.3	1.4	0.2	0.0	1.5	7.0

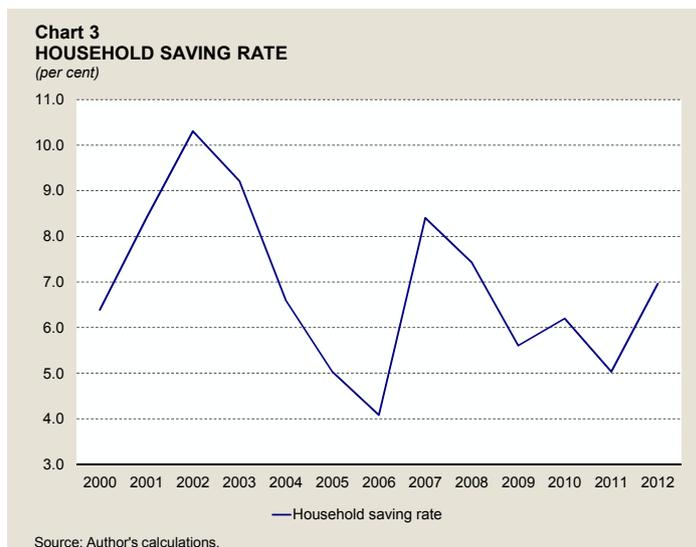
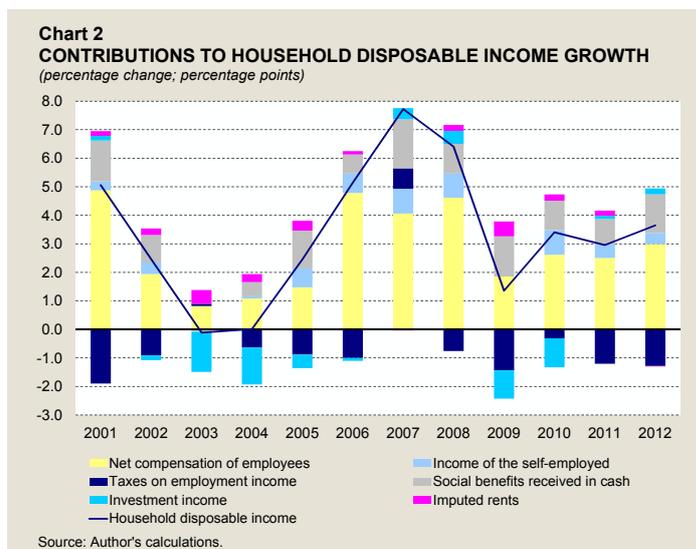
Sources: Author's calculations; NSO.

²⁴ This figure is based on data weighted by value.

²⁵ All series used in this study are in euro terms. Since all conversions from Maltese lira to euro are based on the historical exchange rate rather than the constant conversion rate, growth in disposable income partly reflects movements in the exchange rate. This, however, is only the case between 2001 and 2005, because in May 2005 Malta joined ERM 2 and there were no changes in the Maltese lira against the euro until 1 January 2008, when Malta left ERM 2 and adopted the euro.

employees and investment income, but also in taxes on employment income. Over the final period, covering the years 2010-2012, disposable income growth rose and then stabilised at a rate of around 3.3%, on average. All components except social benefits received in cash and imputed rents contributed significantly to this increase in growth.²⁶

Chart 3 depicts the evolution of the saving rate between 2000 and 2012. Again, the series is characterised by four distinct periods. The first, spanning 2000 to 2002, witnessed an increase in the saving rate as disposable income growth outpaced consumption growth. Between 2003 and 2006, the saving rate declined, first owing to a drop in disposable income that was compounded by an increase in consumption, and then because the rise in disposable income fell short of consumption growth. In 2007 the saving rate rose considerably, mirroring stronger disposable income growth and weaker growth in consumption. The final period, covering 2008 to 2012, is marked by a relatively moderate decline in the saving rate, reflecting the fact that over this period consumption grew at a slightly faster rate than disposable income.²⁷



Conclusion

This article presented a new measure of household disposable income for Malta, which widens the range of research that can be conducted on the domestic economy. The measure, however, carries some limitations and therefore researchers should use the data with caution. In particular, while the series is likely to capture the dynamics of disposable income, and hence the saving rate, reasonably well, it should not be used to gauge the level of these variables. In light of this, a useful avenue of research would be to pursue this work further and improve on this measure of disposable income, a key macroeconomic variable which has important economic and social implications.

²⁶ An earlier, but broadly similar, version of the new measure of disposable income was found to explain domestic private consumption behaviour remarkably well, as documented in Grech, O., Micallef, B., Rapa, N., Grech, A. G. and Gatt, W., "A Structural Macro-Econometric Model of the Maltese Economy", *Working Paper No. 02/2013*, Central Bank of Malta.

²⁷ The degree of volatility in the saving rate is comparable with that exhibited by data for other countries.