RedFame

Applied Economics and Finance
Vol. 6, No. 4; July 2019
ISSN 2332-7294 E-ISSN 2332-7308
Published by Redfame Publishing
URL: http://aef.redfame.com

Wealth Effects on Consumption in Malta: Evidence from Household Level Data

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Received: March 29, 2019 Accepted: June 3, 2019 Available online: June 5, 2019

doi:10.11114/aef.v6i4.4315 URL: https://doi.org/10.11114/aef.v6i4.4315

Abstract

This paper attempts to examine for the first time the effects of household wealth on consumption in Malta, based on household level data from the 2017 Household Finance and Consumption Survey (HFCS). The estimation of the log-log consumption function is performed using OLS regression, after taking into account the survey design. The results provide evidence in support of the existence of a wealth effect on consumption, stemming from housing and financial wealth. In particular, the housing wealth effect on consumption is positive and higher than the financial wealth effect for the whole sample size, especially for homeowners. In addition, comparisons in the differences in wealth effects across age groups confirm the existence of a life-cycle pattern in consumption.

Keywords: consumption, wealth, household survey

1. Introduction

The existence of a consumption-wealth channel is of particular importance to analyse the transmission of monetary policy to consumer behaviour (Arrondel et al., 2019). Aggregate consumption is the result of accumulated consumption behaviours, reflecting heterogeneous reactions to wealth shocks (Arrondel et al., 2019). The empirical literature on the macroeconomic impact of wealth on consumption is extensive. However, at the micro level, research is rather limited. Less is known about the elasticity and marginal propensity to consume (MPC) with respect to wealth, heterogeneity in the above measures and their implications for aggregate demand.

This paper contributes to the existing literature by exploring the effects of wealth on consumption in Malta, based on household level data from the 2017 Maltese HFCS. In particular, the main focus of this paper is on the effects of housing and financial wealth on consumption. Moreover, the paper examines potential heterogeneity that may be present in different levels of wealth, household composition and debt. The model is based on a linear consumption function expressed in logarithmic form. More specifically, consumption expenditure is regressed on housing and financial wealth as well as on a set of control variables to account for household life-cycle characteristics, preferences and income expectations.

Results suggest that the effect of housing wealth on consumption is positive and larger than that of financial wealth for the sample size as a whole. These effects are also found when examining the subsample of homeowners, and tend to be larger in magnitude. By comparing differences in wealth effects across different household age groups, we find evidence consistent with the life-cycle pattern in consumption both for the whole sample size and for the subsample of homeowners.

The paper is organized as follows. Following introduction, Section 2 presents a brief literature review. The third section explains methodological approaches and the fourth section presents results and interpretations. The last section is devoted to conclusions.

2. Literature Review

There is considerable empirical literature on the effects of housing wealth. The majority of the studies provide supportive evidence of wealth effects, both in housing and financial wealth. Most of the studies employ aggregate level panel data, mainly due to the easy access to such data. However, the results are rather mixed. On the one hand, studies by Case et al., (2006) and Carroll et al., (2011) find that housing wealth has a significant and large effect on consumption in the US and the OECD countries respectively, while the effects of financial wealth are rather small. On the other hand, Sousa (2009) in the Euro Area and Ludwig and Slok (2004) for the OECD countries provide evidence of

significant wealth effects with respect to financial wealth and weak in the case of housing wealth.

More recently, a growing strand of the literature is increasingly using household level panel data and cross-sectional data to explore the effects of wealth on consumption. For instance, Mian et al., (2013) find that the marginal propensity to consume out of wealth and income varies to a great extent according to household wealth and age, with MPC being larger for households with lower net wealth. As is well documented, wealth is unevenly distributed in many countries around the globe and it is plausible to argue that these differences in household wealth may impact on aggregate consumption. Campbell and Cocco (2007) explore housing wealth effects in the UK and provide evidence in line with the life-cycle theory and consumption smoothing. Sierminska and Takhtamanova (2007) examine wealth effects for Canada, Finland and Italy, using cross-sectional data from the Luxembourg Wealth Study to provide evidence in favour of a large and significant housing wealth effect on consumption compared to that of financial wealth. The latter effect was found to be pronounced in all countries for older households, while the housing wealth effect is lesser for younger households.

With regards to evidence of heterogeneity in the MPC across different levels of wealth, the literature is limited (Arrondel et al., 2019). Studies that attempt to fill this gap include Bover (2005), Arrondel et al., (2014) and Christelis et al., (2015). The first two papers find some evidence of decreasing MPC out of wealth, while the third does not. A recent paper by Arrondel et al., (2019) addresses a gap in the literature by examining heterogeneity over the entire spectrum of the wealth distribution, taking into consideration the composition of wealth as well.

More broadly, there are other papers that use micro-level data to study the effect of sales on consumption. For example, Guo and Luo (2017) employ a novel product-level dataset to find that retail sales have a large effect on consumers' purchases.

3. Methodology and Data

3.1 Data Description

Our analysis is based on data from the Maltese Household Finance and Consumption Survey, which was conducted in 2017. The survey includes detailed questions about households' wealth, income and consumption patterns, and on specific forms of credit constraints. These questions are answered by the most financially knowledgeable household member, that is, the reference person of a household. All information is provided at the household level. Moreover, the data in this paper refer to annual impacts in 2016.

In the framework, wealth is split into housing wealth and financial wealth. In the survey, housing wealth consists of the households' main residence and other real estate properties, investments in self-employed businesses, vehicles, and other valuables. Financial assets are deposits, securities (bonds), listed shares, voluntary pension scheme investments in mutual funds, and life insurance and other financial assets (e.g. amount owned to household). The sampling design of the survey ensures representativeness and the issue of missing values is addressed via five multiple imputations (see HFCN, 2013 for more details on the methodology). Finally, we consider net housing wealth and gross financial wealth, based on the information available in the survey.

Consumption is defined as the amount spent on goods and services. According to ECB (2016), "the one-shot question about spending on goods and services may be an imprecise measure of total consumption and suffer from downward bias, as it may provide significantly lower estimates of total consumption expenditure than data collected at a more disaggregated level. However, data from one-shot questions have been successfully employed in a number of research papers (e.g., Browning and Crossley, 2001, 2008)".

The first step prior to estimating our regression model is to inspect the dataset for outliers and irregularities. Monetary variables are expressed in logarithmic terms to account for some weak nonlinearities in income and wealth with respect to consumption. Households with negative or very high housing wealth (above 5 million euro) and very low annual income (less than 2,000 euro) are excluded from our sample (a total of 6 observations). Additionally, the sample size is restricted to households where the reference person is aged between 25 and 75 so as to avoid survival bias in old ages. As a result, the sample is reduced to 872 households.

3.2 Empirical Strategy

The baseline model is displayed below:

$$\log C = \beta_1 \log Y + \beta_2 \log HW + \beta_3 \log FW + \sum_{i=2}^{N} \beta_{5i} K_i + \sum_{j=1}^{J} \beta_{6j} L_j \quad (1)$$

where C is consumption expenditure, Y is disposable household income, HW is net housing wealth and FW is gross financial wealth. K_i is a dummy for the age of the reference person of a household, while L_j controls for different socioeconomic characteristics. Following the related literature, we include a set of control variables. We control for the

work status and education level of the reference person and household size (number of individuals in households). Moreover, three dummy variables are included. The first relates to credit-constrained households, the second dummy indicates whether a household has received inheritance or gifts in the last three years from the time of the interview. The third dummy variable controls for the subjective expectations of the reference person regarding the evolution of household income in the year right after the interview took place (Note 1). Finally, we also control for quintiles of net wealth.

Note that in this paper it was difficult to identify a causal relationship between wealth and consumption. Rather, estimates are provided on the link between the abovementioned variables, after accounting for observable heterogeneity at the household level.

4. Results

This section presents the estimates relating to the effects of different wealth components on consumption for the whole sample. The same analysis was repeated for the subsample of homeowners. Nonetheless, these results are omitted since they are qualitatively similar to those found in the whole sample. To study the existence of a life-cycle pattern in consumption, estimates for households belonging to different age groups are presented. To further analyse the impact of household heterogeneity on wealth effects on consumption, estimates for households by net wealth quintile groups are also provided. The main results of interest are estimates for the elasticity of consumption with respect to wealth.

Table 1 presents the results of the regression for the whole sample size. The estimates for income and the wealth components are positive and statistically significant. As expected, the estimated elasticity of consumption with respect to income is positive, 0.21%, and considerably higher than the elasticity of consumption with respect to wealth components. The elasticities for net housing wealth and gross financial wealth are also significant and positive, with estimated values of 0.08% and 0.05% respectively. Moreover, the effect of gross financial wealth is highly significant. This reflects the fact that households own at least some form of financial assets, which tend to be highly liquid wealth components.

Table 1. Regression results for the whole sample

Variable	Coefficient	Standard Error	P-value
Income	0.21	0.04	0.00
Net Housing Wealth	0.08	0.04	0.05
Gross Financial Wealth	0.05	0.01	0.00
Age 35–44 years	0.01	0.06	0.88
Age 45–54 years	-0.03	0.06	0.64
Age 55–64 years	-0.12	0.07	0.09
Age 65–75 years	-0.19	0.09	0.05
Inheritance	-0.18	0.05	0.00
Secondary Education	0.09	0.08	0.29
University Education	0.25	0.09	0.01
Self-employed	-0.10	0.09	0.26
Retired	0.18	0.09	0.05
Other	0.06	0.07	0.39
Household Size	0.08	0.02	0.00
Credit Constraint	-0.18	0.14	0.19
Positive Income Expectations	-0.09	0.05	0.07
2nd Wealth Quintile	-0.22	0.07	0.00
3rd Wealth Quintile	-0.34	0.09	0.00
4th Wealth Quintile	-0.43	0.10	0.00
5th Wealth Quintile	-0.24	0.14	0.08
Constant	5.63	0.60	0.00
R-squared	0.15		

The proxy for future income expectations in total household income has a negative and significant effect. This may suggest that Maltese households tend to consume a lower share of their current income or save up a big part of their current income when they are pessimistic about future income, everything else being equal. Moreover, this finding may provide evidence in favour of the existence of a direct wealth effect on consumption apart from that through the confidence channel. With regards to the socioeconomic variables, the effects of age on consumption are significant for households whose reference persons are older than 54 years. Moreover, the negative coefficients for older people suggest a decreasing pattern over the life-cycle. This may indicate the existence of bequest motives. Lastly, household size is positively and significantly associated with consumption levels.

Results for the subsample of homeowners do not considerably change the estimates displayed in Table 1. The estimated elasticity of consumption with respect to net housing wealth is now highly significant, with an estimated coefficient of 0.10%. This result is expected, as homeowners consist mainly of households for whom housing assets are a big part of their portfolio. The elasticity of consumption with respect to income is 0.20%, very close to the estimate obtained for the whole sample, while the estimated elasticity of consumption with respect to financial wealth, 0.05%, is only marginally higher for the subsample of homeowners.

4.1 The Role of Age

According to the life-cycle theory, households smooth consumption over their lifetime, doing so by saving, borrowing against their human capital at the early stages of their lifetime and dissave when they are retired. The notion of consumption smoothing would imply that age itself is not necessarily a significant explanatory variable for the level of consumption, when controlling for all other factors correlated with both the level of consumption and age. However, age is of interest when examining how it affects the proportions in which different components of wealth and income are used to fund consumption.

In view of the above considerations, and to deepen our analysis, regressions were altered to add interaction terms between four age dummies and income and wealth components. The results are based on comparisons between differences in wealth effects across age groups.

The regression model to be estimated is as follows:

$$\log C = \beta_{11}\log Y + \beta_{21}\log HW + \beta_{31}\log FW + \sum_{i=2}^{N}(\beta_{1i}\log Y * K_i + \beta_{2i}\log HW * K_i + \beta_{3i}\log FW * K_i)$$

$$+ \sum_{i=2}^{N} \beta_{5i} K_i + \sum_{j=1}^{J} \beta_{6j} L_j \quad (2)$$

Table 2 displays the estimates of the regression relating to the age effects for the whole sample. There is evidence of the presence of a life-cycle pattern in consumption, and it is observed in the net housing wealth variable across different age groups. This is not surprising given that housing is the largest component of household wealth in Malta. The elasticity of consumption with respect to net housing wealth rises steadily with age and is the largest, 0.32%, for the group of households aged 45–54 years. In the light of life-cycle theory this is a plausible result, as these households are most likely to be downsizing their homes and realising their housing wealth gains ahead of retirement (Lehnert, 2004). The elasticity of consumption with respect to financial wealth displays a similar pattern, although the estimates are not as clearly significant as those for housing wealth. The larger estimate for the elasticity of consumption with respect to financial wealth for the youngest age group may indicate that younger households are more likely to be credit constrained and earn less, rendering their consumption more sensitive to changes in the financial wealth component (Lehnert, 2004). Younger households may thus be more inclined to use their assets as a buffer stock in case of unanticipated changes in income rather than as a long-term savings device. Qualitatively, the estimates for homeowners are similar as for the whole sample.

Table 2. Regression results for the whole sample

Variable	Coefficient	Standard Error	P-value
Income	-0.04	0.07	0.61
Age 35–44 years	0.37	0.13	0.00
Age 45–54 years	0.24	0.10	0.02
Age 55–64 years	0.02	0.11	0.88
Age 65–75 years	0.37	0.11	0.00
Net Housing Wealth	-0.11	0.04	0.00
Age 35–44 years	0.04	0.06	0.49
Age 45–54 years	0.32	0.06	0.00
Age 55–64 years	0.23	0.07	0.00
Age 65–75 years	0.16	0.05	0.00
Gross Financial Wealth	0.02	0.02	0.19
Age 35–44 years	-0.03	0.03	0.24
Age 45–54 years	0.00	0.03	0.97
Age 55–64 years	0.06	0.04	0.11
Age 65–75 years	0.06	0.03	0.02
Age 35–44 years	-3.88	1.37	0.00
Age 45–54 years	-6.38	1.10	0.00
Age 55–64 years	-3.64	1.34	0.01
Age 65–75 years	-6.32	1.26	0.00
Inheritance	-0.19	0.05	0.00
Secondary Education	0.07	0.08	0.36
University Education	0.24	0.09	0.01
Self-employed	-0.12	0.09	0.17
Retired	0.13	0.09	0.13
Other	0.04	0.07	0.54
Household Size	0.08	0.02	0.00
Credit Constraint	-0.14	0.15	0.34
Positive Income Expectations	-0.07	0.05	0.14
2nd Wealth Quintile	-0.16	0.06	0.01
3rd Wealth Quintile	-0.22	0.08	0.00
4th Wealth Quintile	-0.30	0.09	0.00
5th Wealth Quintile	-0.14	0.12	0.23
Constant	10.47	0.94	0.00
R-squared	0.15		

4.2 The Role of Asset Holding Decisions

Endogeneity in asset-holding decisions could potentially affect the robustness of this analysis. For instance, risk preferences, or time, might not be fully captured in the model, plausibly affecting consumption and asset allocation. Thus, regressions were run to check whether the results still hold for households with similar types of assets, i.e. homeowners and bondholders. To this end, a dummy variable was included to reflect homeownership, and it is interacted with net housing wealth. Similarly, a dummy variable for bondholders and its interaction with gross financial wealth was also included.

Table 3. Regression results for the whole sample: the role of asset holding decisions

Variable	Coefficient	Standard Error	P-value
Income	0.21	0.04	0.00
Net Housing Wealth	0.12	0.04	0.01
Gross Financial Wealth	0.05	0.01	0.00
Net Housing Wealth * Homeowners	-0.03	0.01	0.00
Constant	5.50	0.60	0.00
R-squared	0.10		
Variable	Coefficient	Standard Error	P-value
Income	0.20	0.04	0.00
Net Housing Wealth	0.08	0.04	0.02
Gross Financial Wealth	0.02	0.02	0.12
Gross Financial Wealth * Bondholders	0.02	0.00	0.00
Constant	5.81	0.53	0.00
R-squared	0.10		

The top panel of Table 3 shows the estimated coefficients for homeowners. The results are broadly similar to the ones found in Table 1 except for the coefficient of net housing wealth, which is now higher. The bottom panel of the table displays the results for bondholders. Results appear to be largely in line with those in Table 1.

Overall, regression results indicate some heterogeneity when it comes to the response of consumption to housing wealth, but little heterogeneity with respect to financial wealth.

4.3 The Role of House Prices

Higher expectations of income and future activity, which may commonly determine asset prices and consumption, can lead to the issue of spurious correlation (Arrondel et al., 2019). Although a proxy was included to control for future income expectations, there may be some correlation arising from house prices (Cooper, 2013, Arrondel et al., 2019). Saving behaviours can be associated with local developments in house prices, reflecting households with different economic statuses. Therefore, there may be some local heterogeneity in housing prices.

To this end, and to assess the robustness of our results, two types of regressions were performed. In a first step, regressions accounting for households living in three different types of areas were conducted: cities/large urban areas, towns and suburbs/small urban area and rural areas. Table 4 presents the regression results (Note 2). The estimated elasticities for urban and small urban areas are very close to the results presented in Table 1. Only exception is rural areas, which in Malta are very thinly populated.

In a second step, instrumental variable regressions were run to account for potential endogeneity between consumption and housing wealth. In doing so, the research exploits information available in the survey in relation to the degree of urbanisation in the areas where a household lives, dwelling rating and its outward appearance, as proxies for potential heterogeneity in housing prices. Therefore, these variables were used as instruments for housing wealth. To save space, and since this test produces similar insights as the first one, we have chosen to omit the results.

Overall, both robustness tests indicate the existence of some degree of heterogeneity in the effect of housing wealth on consumption across areas. However, this study does not find evidence in support of endogeneity issues as a result of unobservable heterogeneity. This is perhaps because of our rich set of control variables.

Table 4. Regression results for whole sample: heterogeneity in house prices

Urban areas			
Variable	Coefficient	Standard Error	P-value
Income	0.20	0.05	0.00
Net Housing Wealth	0.08	0.04	0.05
Gross Financial Wealth	0.05	0.01	0.00
R-squared	0.14		
Small urban areas			
Variable	Coefficient	Standard Error	P-value
Income	0.15	0.06	0.01
Net Housing Wealth	0.15	0.07	0.05
Gross Financial Wealth	0.03	0.02	0.12
R-squared	0.12		
Rural areas			
Variable	Coefficient	Standard Error	P-value
Income	0.14	0.09	0.13
Net Housing Wealth	-0.07	0.06	0.24
Gross Financial Wealth	0.23	0.02	0.00
R-squared	0.21		

4. Conclusions

This paper provides for the first time micro-estimates of the elasticity of consumption with respect to housing and financial wealth for Malta based on household level data from the 2017 HFCS. We find that the effect of housing wealth on consumption is positive and larger than that of financial wealth effect for the sample size as a whole. These effects are also found when examining the subsample of homeowners and are larger in magnitude. By comparing differences in wealth effects across different household age groups, we find evidence consistent with the life-cycle pattern in consumption both for the whole sample size and for the subsample of homeowners. Our analysis reveals some heterogeneity in the effect of housing wealth on consumption and given an 81% homeownership rate in Malta, these heterogeneities have to be considered when performing welfare analysis.

Notes

Note 1. The dummy takes the value of 1 if the reply to the question: '*Over the next year, do you expect your (household's) total income to go up more than prices, less than prices, or about the same as prices?*' was more than prices or about the same as price, given the short period window set out in the question

Note 2. Estimation for the subsample of homeowners yields similar qualitatively and quantitatively results.

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