Housing wealth, financial wealth, and consumption: New evidence for Italy and the UK

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ABSTRACT

This paper aims to investigate the long-run impact of housing and financial wealth on consumption in Italy and the UK using two different estimation methods. The novelty of the paper is to consider the recent financial crisis when studying wealth effects. The dynamics of wealth effects are also evaluated by a rolling regression analysis. The results show that: i) housing wealth plays no role in Italy, whereas it is significant in the UK; ii) in both countries, the financial wealth exerts a positive and significant impact on aggregate consumption; and iii) by and large, the housing wealth effect assumes relatively increasing importance over time in the UK, while for Italy this is true for the financial wealth effect.

1. Introduction

The analysis of the influence of wealth on consumption has gained large attention since the formulation of the life-cycle hypothesis of saving by Ando and Modigliani (1963). The literature has focused on the impact of different forms of wealth on aggregate consumption and savings decisions and on different methods of estimation. The bulk of the work has mainly looked at US experience (see Poterba, 2000; Davis & Palumbo, 2001; Lettau & Ludvigson, 2004; Klyuev & Mills, 2007; Donihue & Avramenko, 2007; Carroll, Otsuka, & Slacalek, 2011; Caporale, Costantini, & Paradiso, 2013; among others), although increasing significant attention has been paid to experiences in other countries (see Ludwig & Sløk, 2004; Ferndandez-Corugedo, Price, & Blake, 2007; Afonso & Sousa, 2011; Carroll, Slacalek, & Sommer, 2011; Jasens, 2013; Sonjea, Casnib, & Vizekc, 2014; among others). Most of these studies have used macro data and time series approaches, mainly unit root and cointegration techniques. On the contrary, Carroll, Otsuka, and Slacalek (2006) and Carroll, Otsuka and Slacalek (2011) propose a simple methodology based on the literature on the stickiness of consumption growth. According to these authors, their method is preferable to cointegration-based approaches mainly because shocks to fundamental aspects for consumption/saving decisions (for example, changes to demography or productivity growth) are so frequent, even in more stable economies such as the US, that it is quite difficult to find evidence of a stable cointegrating relationship.

This paper aims to study the long-run financial and housing wealth effects on consumption in Italy and the UK over the period 1972–2012, using both the approach proposed by Carroll, Otsuka, and Slacalek (2011) and the DOLS estimator by Stock and Watson (1993). To the best of our knowledge, Slacalek (2009) and Sousa (2010b) also use these two approaches when studying wealth effects.

The estimation approach by Carroll, Otsuka, and Slacalek (2011) consists of three steps. In the first step, the degree of stickiness in consumption growth is estimated using instrumental variables (IV) method. In the second one, the immediate (short-run) effect of a wealth shock on consumption is estimated. Lastly, the estimated parameters from the previous steps are combined to obtain the eventual (long-run) marginal propensity to consume. Stock and Watson (1993) developed the Dynamic OLS (DOLS) estimator in order to improve on the OLS method by dealing with small sample and dynamic bias. In particular, lags and leads of first difference of the regressors are used to correct for endogeneity when estimating the cointegrating (long-run) parameters.

The novelty of our paper is to consider the recent period of the financial crisis when studying wealth effects on aggregate consumption. Second, we focus on Italy and the UK since the crisis hit the two countries in a different way because of their diverse financial systems, which

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crucially account for the strength of wealth effects. The impact of the crisis on the UK financial system was faster and more intense due to the higher exposure to the US market, in particular to the toxic subprime assets (see for example Choudhry & Jayasekera, 2014). Furthermore, the high level of indebtedness of UK households also amplified the impact of the crisis in this country. The UK economy flatlined after the 2008–09 recession, and only recently it has returned to grow at pre-crisis rates. On the contrary, the Italian financial system was not dramatically affected by the crisis at the beginning, though its negative impact on the real economy is still in place. This was mainly due to: i) a solid framework for financial regulation and supervision; and ii) a traditional configuration of unsophisticated financial activities, which are mainly bank-based and characterized by a relatively low leverage ratio, a high and large stable base of depositors, and low exposure to risky activities (see Quaglia, 2009).

Finally, our paper contributes to the literature by offering a rolling regression analysis so as to evaluate how the marginal propensity to consume (MPC hereafter) out of financial and housing wealth has evolved over time.[1]

Regardless of the estimation method used, our empirical findings over the full sample period show that: i) the total wealth effect is higher in the UK than Italy; ii) housing wealth plays no role in Italy as expected, and in line with previous studies, while the housing wealth effect is significant in the UK; and iii) in both countries, financial wealth exerts a positive and significant impact on aggregate consumption. As for the rolling analysis, both estimation methods show: i) an insignificant effect of housing wealth for Italy over time, as opposed to a slight increasing trend for the effect of financial wealth; and ii) a declining trend for the financial wealth effect in the UK, along with a relatively increasing trend for the housing wealth effect, in large part of the examined period.

The rest of the paper is organized as follows. Section 2 briefly reviews the existing literature on wealth effects on consumption in Italy and the UK. Section 3 presents the data. Section 4 describes the econometric methodology. Section 5 discusses the empirical results. Section 6 concludes.

2. A review of the literature

The literature on wealth effects on consumption is vast.[2] As the focus of this paper is the study of financial and housing wealth effects in Italy and the UK, we briefly review the empirical literature related to these countries that uses macro data and time series approaches.

We consider both single-country (Bassanetti & Zollino, 2010, for Italy, and Márquez, Martínez-Caete, & Pĕrez-Soba, 2013, for the UK) and cross-country analyses (Aron, Duca, Muellbauer, Murata, & Murphy, 2012; Barrell & Davis, 2007; Boone & Girouard, 2002; Byrne & Davis, 2003; Catte, Girouard, Price, & André, 2004; Slacalek, 2009; Sousa, 2010a).

It emerges that the housing wealth effect is rather irrelevant in Italy, and sometimes even negative. In particular, Boone and Girouard (2002) and Slacalek (2009) find negative values for the marginal propensity to consume out of housing wealth (−0.06 and −0.01, respectively), while Catte et al. (2004) and Bassanetti and Zollino (2010) find positive values, ranging from 0.01 to 0.02. On the contrary, the housing wealth effect for the UK is relevant. More specifically, values range from about 0.03 to 0.14. The highest value is observed in Márquez et al. (2013). These authors apply a momentum threshold autoregressive model (M-TAR) modified in a multivariate framework over the period 1976–2009, and use the credit condition index developed by Fernandez-Corugedo and Muellbauer (2006) to capture the influence of credit market conditions on wealth effects. Their results show that this index has a positive and

significant effect on consumption in the long-run. Catte et al. (2004) and Slacalek (2009) also find a high positive value for the housing wealth effect in the UK at 0.07. However, while Catte et al. (2004) apply an error correction model to estimate the consumption equation, Slacalek (2009) uses a simple estimation approach based on the sluggishness of consumption growth that implies calculation of the immediate and eventual MPCs.

The empirical evidence on the financial wealth effect turns to be stronger for Italy than the UK. Slacalek (2009) finds a high value at 10% for the MPC in Italy over the period 1971–1994. Boone and Girouard (2002) estimate a lower value at 8%, for a different sample period, using a cointegration analysis, and Bassanetti and Zollino (2010) estimate a range of values from 4% to 6% using a VECM with two dummies in order to control for the possibility of level shift in the long-run equilibrium. The two dummies refer to the period of the severe currency crisis, 1992–1993, and the period when Italy joined the single currency area, respectively.

Estimates of MPCs out of financial wealth for the UK range from 0.02 to 0.06, with Márquez et al. (2013) estimating the highest of these figures. These authors also find an asymmetric consumption adjustment to both financial and housing shocks. By contrast, the lowest value for the financial wealth effect in the UK is found in Byrne and Davis (2003), who estimate a value of 2% over the period 1972–1998.

3. Data

This paper uses quarterly data, spanning from 1972q4 to 2012q4, provided by the National Institute of Economic and Social Research (NIESR), NiGEM data, if not differently indicated.

The consumption data are total private consumption expenditures, as sums of durable and non-durable goods. Total consumption is the variable of interest when investigating the consumption-wealth channel (see Mehra, 2001), though conventional theories point at the flow of non-durable and services consumption, since durable consumption can be seen as a replacement and addition to the capital stock (see Peltonen, Sousa, & Vansteenkiste, 2012). Similar to us, most of the studies discussed in the literature combine non-durable and durable consumption, in part because durable spending is a relatively small part of the total, and in part because durables are among the major entities on which resources raised by mortgage refinancing are spent on (see Peltonen et al., 2012). Further, Paradiso, Casadio, and Rao (2012) argue that consumption of durable goods, as a component of private consumption, is likely to be linked to the business cycle pattern and asset market dynamics.

The disposable income data are defined as total market income plus transfers from government less income taxes and social contributions. The net financial wealth data correspond to gross financial assets owned by households less their financial liabilities, which include both mortgages and consumer credit. The housing wealth data consist of the current value of the stock of housing capital owned by the personal sector. Housing wealth is benchmarked on annual housing wealth data, interpolated in year in line with house prices and quarterly expenditure on housing investment. House prices are from the Bank for International Settlements (BIS) database.

All series are deflated by personal consumption expenditure price index and expressed in per capita terms. The population series are interpolated from annual data, and the sources are ISTAT (Italian National Institute of Statistics) for Italy, and ONS (Office for National Statistics) for the UK.

When plotting total wealth and its components for Italy and the UK (see Fig. 1), the following patterns may be highlighted by examining the related descriptive statistics:

i. The growth rates of per capita wealth components were similar for the two countries until the recent financial crisis, with no substantial difference between the two kinds of wealth. In particular, the growth rates of housing wealth averaged 1.16% and 1.19% for Italy

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[1] Differently from our paper, Sousa (2010a), who compares the wealth effects on consumption in the UK and the US, provides a rolling regression analysis to show the faster rate of convergence of the coefficients to the "long-run equilibrium" parameters.

[2] The studies of wealth effects also look at monetary and fiscal policy (see Agnello, Castro, & Sousa, 2012; Dey, 2014; Mallick & Sousa, 2012), and at the relationship between wealth and risk premium (Lustig, Van Nieuwerburgh, & Verdelhan, 2013; Sousa, 2012).
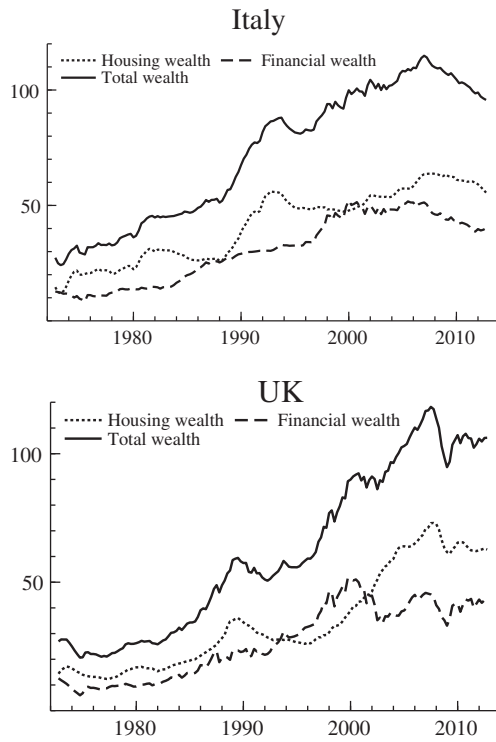
Italy

UK

Fig. 1. Per capita real total, financial and housing wealth 1972q4–2012q4.

and the UK, respectively, while those for financial wealth averaged 1.12% and 1.16%, respectively;

ii. Since the beginning of the crisis to the end of the period, the growth rates of wealth components were more negative in Italy than the UK. More precisely, figures are: −0.51% as opposed to −0.34% for housing wealth, and −0.97% as opposed to −0.005% for financial wealth, for Italy and the UK, respectively;

iii. In terms of standard deviations, financial wealth growth is more than twice as volatile as housing wealth growth, before and after the crisis, for the UK. By contrast, this is true for Italy only from the beginning of the crisis onwards.

The dynamics of housing wealth are driven primarily by house prices, which follow similar trends in both countries. In particular, house prices grew remarkably from the late 1990s to the first quarters of 2008, with a higher growth for the UK, before starting to decrease. However, while in the UK, after a more sharp decrease, real house prices have remained stable since the second quarter of 2009, in Italy they have continued to decrease, even more sharply, over the last quarters of the period.

Regarding the evolution of the financial wealth, a similar sustained upward trending pattern is observed for both countries during the Internet bubble period. By contrast, during the burst of the bubble (2000–2003), the slump in stock prices and the resulting economic stagnation triggered a downward trend, which was much steeper in the UK than Italy. This difference reflects the higher correlation between financial wealth and stock prices in the UK, due to a higher share of quoted equities. After a period of temporary recovery of financial wealth up to 2007 (stronger in the UK than Italy), both countries experienced a reduction in the value of financial assets due to the financial crisis. However, unlike Italy, the UK has seen a reversal of the trend since the beginning of 2009.

4. Econometric methodology

In this section we briefly present the two estimation methods used in our empirical analysis, namely the DOLS estimator developed by

Stock and Watson (1993) and the procedure by Carroll, Otsuka, and Slacalek (2011). We use the DOLS estimator to estimate the following equations:

$$\log C_t = \beta_0 + \beta_y \log Y_t + \beta_w \log TW_t + \varepsilon_t, \tag{1}$$

$$\log C_t = \beta_0 + \beta_y \log Y_t + \beta_{fw} \log FW_t + \beta_{hw} \log HW_t + \varepsilon_t, \tag{2}$$

where all the variables are expressed in real per capita terms, and log indicates the logarithm. More in detail, C_t is the total consumption expenditure, Y_t is the personal disposable income, TW_t denotes the total wealth, FW_t indicates the financial wealth, and HW_t is the housing wealth. Further, the estimated coefficients represent elasticities.

Carroll, Otsuka, and Slacalek (2011) derive their method for estimating the wealth effect on consumption from the literature on the sluggishness of aggregate consumption growth. Following Sommer (2007), the authors argue that the following equation better describes the dynamics of aggregate consumption growth:

$$\Delta \log C_t = \zeta + \chi \Delta \log C_{t-1} + \varepsilon_t. \tag{3}$$

The parameter χ, which lies between 0 and 1, represents the strength of habits, according to the framework of habit formation, or the share of the population who is unaware about macroeconomic news, according to the framework of sticky expectations. Sommer (2007) has proposed instrumental variables regression to estimate consumption sluggishness χ in Eq. (3), in order to avoid the potential bias of OLS estimates.

Once χ is estimated, the second step of the estimation procedure consists of identifying the immediate effect of wealth shocks on consumption. To this end, ε_t in Eq. (3) is meant to be driven in part by wealth shocks, ∂W_t, and in part by other (control) variables $\tilde{Z}_t$:

$$\varepsilon_t = \alpha_w \partial W_t + \alpha_z^{\mathsf{T}} \tilde{Z}_t, \tag{4}$$

which turns, after several steps, into:

$$\partial C_t = \alpha_0 + \alpha_w \overline{\partial} W_{t-1} + \alpha_z^{\mathsf{T}} Z_{t-1} + \varepsilon_t, \tag{5}$$

where $\partial C_t = \Delta C_t / C_{t-5}$, $\overline{\partial} W_{t-1} \approx \chi(\Delta W_{t-1} + \chi \Delta W_{t-2} + \chi^2 \Delta W_{t-3} + \chi^3 \Delta W_{t-4})/C_{t-5}$, $\alpha_z^{\mathsf{T}} = (\alpha_z^{\mathsf{T}} \chi, \alpha_z^{\mathsf{T}} \chi^2, \ldots)$, and $Z_{t-1}^{\mathsf{T}} = (\tilde{Z}_{t-1}^{\mathsf{T}}, \tilde{Z}_{t-2}^{\mathsf{T}}, \ldots)$ are control variables. It should be underlined that ∂C_t is not equal to consumption growth $\Delta C_t / C_{t-1} \approx \Delta \log C_t$, but the two variables are almost perfectly correlated as C_t and C_{t-5} are very similar. Given the estimates of χ and α_w, the immediate MPC out of wealth is α_w / χ, while the eventual MPC is the geometric sum:

$$\sum_{i=1}^{\infty} \chi^i \frac{\alpha_w}{\chi} = \frac{\alpha_w}{\chi(1-\chi)}. \tag{6}$$

In order to estimate the immediate MPCs and eventual MPCs out of financial and housing wealth, respectively, we also consider the following equation:

$$\partial C_t = \alpha_0 + \alpha_{fw} \overline{\partial} FW_{t-1} + \alpha_{hw} \overline{\partial} HW_{t-1} + \alpha_z^{\mathsf{T}} Z_{t-1} + \varepsilon_t. \tag{7}$$

5. Empirical results

This section presents and discusses the results of the empirical analysis for Italy and the UK. We estimate the marginal propensities to consumption out of wealth components, using both the DOLS estimator and the method proposed by Carroll, Otsuka, and Slacalek (2011).[3] We also

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[3] The marginal propensity to consume out of income is not reported here, as we primarily focus on wealth effects.

Table 1
Phillips and Perron (1988) unit root test results. Level and first difference.

Italy		UK	
Variables	PP	Variables	PP
$\log C_t$	0.826 (0.999)	$\log C_t$	−0.514 (0.982)
$\log Y_t$	−0.348 (0.989)	$\log Y_t$	−0.303 (0.990)
$\log TW_t$	0.097 (0.997)	$\log TW_t$	−2.199 (0.486)
$\log FW_t$	−0.168 (0.993)	$\log FW_t$	−2.137 (0.521)
$\log HW_t$	−1.968 (0.614)	$\log HW_t$	−2.160 (0.508)
$\Delta \log C_t$	−8.634*** (0.000)	$\Delta \log C_t$	−11.847*** (0.000)
$\Delta \log Y_t$	−10.126*** (0.000)	$\Delta \log Y_t$	−16.319*** (0.000)
$\Delta \log TW_t$	−9.798*** (0.000)	$\Delta \log TW_t$	−9.766*** (0.000)
$\Delta \log FW_t$	−12.841*** (0.000)	$\Delta \log FW_t$	−11.031*** (0.000)
$\Delta \log HW_t$	−7.467*** (0.000)	$\Delta \log HW_t$	−6.463*** (0.000)

PP indicates the unit root test of Phillips and Perron (1988). Model with a constant and trend is considered. ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively. Andrews automatic bandwidth is applied. p-values are in parenthesis (see MacKinnon, 1996).

Table 2
Phillips and Ouliaris (1990) cointegration test results.

Eq. (1)			
Italy		UK	
Statistics	Value	Statistics	Value
ADF	−3.030 (0.238)	ADF	−5.051*** (0.001)
Z_α	−18.805 (0.168)	Z_α	−45.054*** (0.001)

Eq. (2)			
Italy		UK	
Statistics	Value	Statistics	Value
ADF	−4.443** (0.024)	ADF	−5.368*** (0.001)
Z_α	−36.018** (0.017)	Z_α	−51.699*** (0.001)

As for the ADF and Z_α statistics, see Tables Ib and IIb in Phillips and Ouliaris (1990), respectively.
ADF and Z_α statistics are performed on the residuals from a cointegrating equation with a constant, using a Bartlett kernel and Newey–West automatic bandwidth (NW automatic length lag = 4).
MacKinnon (1996) p-values are in parenthesis.
***, **, and * denote significance at the 1%, 5% and 10% levels, respectively.

perform a simple exercise based on a rolling regression analysis to study the dynamics of the MPCs over time.

As for the DOLS estimation, a preliminary analysis on unit root and cointegration is carried out using unit root tests by Phillips and Perron (1988) and cointegration tests by Phillips and Ouliaris (1990), respectively. In particular, for the cointegration tests, we use ADF and Z statistics (see Tables Ib and IIb in Phillips & Ouliaris, 1990, respectively). Results are reported in Tables 1–2. It emerges that all the series under consideration are I(1) processes for both Italy and the UK. Further, a clear-cut evidence of cointegration is found at 1% significance level in all the cases for the UK (see Eqs. (1)–(2)). As for Italy, related results seem to be less conclusive. While cointegration is found for Eq. (2) at 5% significance level, the null hypothesis of no cointegration cannot be rejected for Eq. (1), although the statistics Z_t is not far from being significant at 10% level. However, results of the trace test by Johansen (1988), which we perform for robustness check, clearly show the existence of a cointegrating vector at 5% significance level in all the cases (see Table A1).

Table 3 reports the estimated MPCs out of total, financial and housing wealth. In particular, those by the DOLS estimator are obtained by multiplying the estimated elasticities in Eqs. (1)–(2) (see Table B1) by the sample mean ratio of consumption to the respective variable of interest, which are in our case total, financial and housing wealth (on this see Catte et al., 2004; Donihue & Avramenko, 2007).[4] As far as the method by Carroll, Otsuka, and Slacalek (2011) is concerned, eventual MPCs are obtained from Eq. (6), once the parameter χ, which measures the stickiness of consumption, and immediate MPCs (see Eqs. (3), (5) and (7)) are estimated (see Table B2).

Results for Italy show slightly different estimates for total wealth effects by the two methods: the MPC out of total wealth takes an insignificant value of 0.010 when using the method by Carroll, Otsuka, and Slacalek (2011), compared to a significant value of 0.018 by the DOLS estimator. These values are in line with those in previous studies (see Byrne & Davis, 2003; Slacalek, 2009). When splitting total wealth into financial and housing components, more similar results are found. A nil effect for housing wealth is detected (0.007 by DOLS as opposed to −0.003 by Carroll, Otsuka, and Slacalek, 2011), compared to a significant financial wealth effect: 2.4% by DOLS compared to a slightly larger 2.8% by the procedure in Carroll, Otsuka, and Slacalek (2011). Girouard

and Blöndal (2001), Boone and Girouard (2002), and Slacalek (2009) find for Italy a similar nil effect for housing wealth, but a higher financial wealth effect.

Similarly to Italy, estimates of total wealth effects for the UK differ slightly across the two estimation methods: 0.020 by DOLS as opposed to 0.032 by the method of Carroll, Otsuka, and Slacalek (2011) (similar results are in Girouard & Blöndal, 2001, and Byrne & Davis, 2003). As regards disaggregate wealth effects, even though to lesser extent, estimates by both methods confirm a pattern highlighted in other works related to Anglo-Saxon countries. That is, the housing wealth effect seems to be more important than financial wealth effect: estimates are 2.8% and 3.0% by DOLS and by the method of Carroll, Otsuka, and Slacalek (2011), respectively, as opposed to 2.1% and 2.3% for the financial wealth effect (see Aron et al., 2012; Catte et al., 2004; Ludwig & Sløk, 2004; Slacalek, 2009).

The above findings allow to highlight that: i) the effect of total wealth on consumption is substantially higher in the UK than Italy; ii) the financial wealth effect in Italy is about as important as in the UK, though financial wealth dominates in the latter country. A less generous State pension scheme in the UK may explain this feature. Indeed, most of its financial wealth is held in the form of insurance and pension products, which is usually associated with a lower MPC; iii) although housing wealth is widespread in Italy, it does not exert any sizeable incidence on consumption, reflecting the absence of the mechanism of mortgage equity withdrawal. By contrast, the housing wealth effect turns to be important in the UK, because of the experience of credit market liberalization.

As for the dynamics of the MPC out of financial and housing wealth over time, we run a rolling regression using a window of 60 observations. The first rolling estimate covers the period 1972q4–1987q3, whereas the last one is related to the period 1998q1–2012q4.

Fig. 2 shows that the two estimation methods provide roughly similar trends.[5] In particular, when focusing on the UK, we can observe a common descending trend for the financial wealth effect, starting from mid-1990s, which is more pronounced for estimates provided by the method of Carroll, Otsuka, and Slacalek (2011). More in detail, estimates are at around 2% in the initial period of the rolling exercise and decrease afterwards until reaching a value above 1% at the end of period. The pattern in the late 1990s may reflect the increasing importance that consumers might have attributed to real assets for their consumption

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[4] For the DOLS estimator, we use 4 lags and leads of the first difference of the regressors. By Monte Carlo analysis, Ng and Perron (1997) recommend to use large lag length to obtain more precise estimates.

[5] Fig. C1 in Appendix C reports the rolling estimates for MPCs with the error bands.

Table 3
MPCs. Total, housing and financial wealth effects.

DOLS					
Italy			UK		
Total	Financial	Housing	Total	Financial	Housing
0.018***	0.024***	0.007**	0.032***	0.023***	0.030***
Carroll, Otsuka, and Slacalek (2011)					
Italy			UK		
Total	Financial	Housing	Total	Financial	Housing
0.010	0.028***	− 0.003	0.020***	0.021***	0.028***

***, ** and * denote significance at the 1%, 5% and 10% levels.

behavior relatively to financial assets, in a period when house prices started to surge in the UK. Indeed, our estimated trends for housing wealth are increasing in the late 1990s, particularly in the case of the approach by Carroll, Otsuka, and Slacalek (2011). However, housing wealth effects decline from 2000 to mid-2000s (this is particularly true for the estimates by Carroll, Otsuka, and Slacalek, 2011). This may be due to a weaker collateral channel during this period, when more widespread availability of credit made households face looser credit constraints. As a result, further house price rises over the period have weakened household dependence on house price gains to facilitate consumer spending (see Benito, Thompson, Waldron, & Wood, 2006; Chandler & Disney, 2014).

Looking at the period during the recent financial crisis, it can be noticed that MPCs out of financial and housing wealth are increasing, with a more pronounced effect for the housing wealth effect by the method of Carroll, Otsuka, and Slacalek (2011). The findings may be attributable to a stronger persistence in consumption habits, as reflecting an increasing reluctance of UK habit-forming consumers to change their consumption path during the financial crisis, which saw remarkable reductions of the values of assets (see Fig. 1). As such, higher MPCs out of both financial and housing wealth result in an attempt for consumers to smooth their changes in consumption.

In regard to Italy, the financial wealth effect displays trends that are slightly increasing over time. This pattern may reflect the development of the financial market over the period under consideration, which has allowed financial assets to play a more incisive role. By contrast, when dealing with the housing wealth effect, the two methods confirm that in Italy this effect is practically nil over time, a finding consistent with an underdeveloped mortgage market featuring the Italian economy.

Regarding the dynamics in Italy during the financial crisis, one can observe relatively increasing estimates of the financial wealth effect by the method of Carroll, Otsuka, and Slacalek (2011), compared to stable DOLS estimates. Unlike the UK, habit formation behavior in Italy seems to be much less important during this period. Perhaps, more incisive drops in wealth components and the more negative impact of credit constrains during the financial crisis in the UK than Italy may explain these differences in the two countries.

6. Conclusions

This paper studies the long-run housing and financial wealth effects on consumption in Italy and in the UK, taking into consideration the recent period of financial crisis.

The impact of the crisis on the two countries was different, mainly due to their distinctive financial systems, which crucially account for the strength of wealth effects. The impact in the UK was faster and more intensive due to a higher exposure to the US stock market, and the high level of indebtedness of UK households. By contrast, Italy observed a less dramatic impact, though the recession is still in place.

This paper contributes to the empirical literature in some respects. First, to the best of our knowledge, this is the first paper to thoroughly compare wealth effects in Italy and the UK using macro data. To this end, we estimate marginal propensities to consume out of wealth components over the period 1972–2012, using two different estimation methods: the DOLS estimator by Stock and Watson (1993) and the method proposed by Carroll, Otsuka, and Slacalek (2011). Second, we carried out a rolling analysis to investigate how wealth effects evolved over the examined period, with a particular focus on the recent period of financial crisis.

The empirical results over the entire sample show that: i) housing wealth plays no role in Italy, whereas it is significant in the UK; and ii) in both countries, the financial wealth exerts a positive and significant impact on aggregate consumption. As for the rolling analysis, both estimation methods show: i) an insignificant effect of housing wealth for Italy over time, as opposed to a slight increasing trend for the effect of
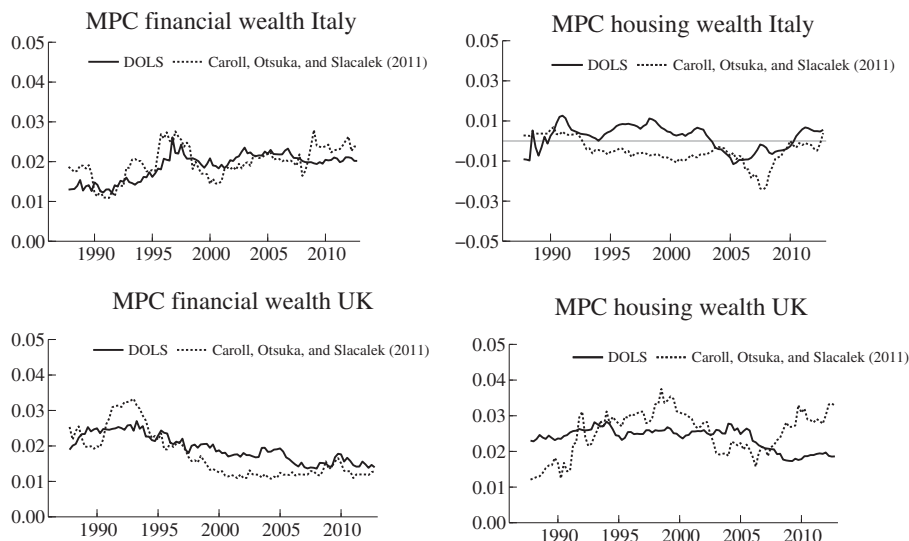

Fig. 2. Rolling estimates for MPCs out of financial and housing wealth.

financial wealth; and ii) a declining trend for the financial wealth effect in the UK, along with a relatively increasing trend for the housing wealth effect, in large part of the examined period.

The importance of the housing wealth effect in the UK has strong policy implications for this country. These naturally differ from the conclusions one would draw for Italy. Limits on loan to value and loan to income ratios, the drivers of cycles in house prices, could contribute

to damping the cycle in economic activity in the UK. They may also constrain bad lending by banks and reduce the probability of another banking crisis. These tools are much less needed in Italy, as house prices do not impact on consumption, and hence it is likely that they do not contribute to bad lending by banks. Therefore, the difference in housing wealth effects in the two countries should lead to very different policy approaches to the housing market.

Appendix A. Johansen (1988) cointegration test results

Table A1
Johansen (1988) cointegration test results.

$y_t = X'_t \Phi + \varepsilon_t$

$y_t = (\log C_t, \log Y_t, \log TW_t)', X_t = (1, y_{t-i})'$

Italy			UK		
$H_0 : r$	λ_{trace}	CV5 %	$H_0 : r$	λ_{trace}	CV5 %
r = 0	50.205	35.193	r = 0	50.074	35.193
r = 1	12.069	20.262	r = 1	19.411	20.262
r = 2	5.403	9.164	r = 2	7.008	9.164

$y_t = X'_t \Phi + \varepsilon_t$

$y_t = (\log C_t, \log Y_t, \log FW_t, \log HW_t)', X_t = (1, y_{t-i})'$

Italy			UK		
$H_0 : r$	λ_{trace}	CV5 %	$H_0 : r$	λ_{trace}	CV5 %
r = 0	95.454	54.079	r = 0	79.449	54.079
r = 1	32.772	35.193	r = 1	32.547	35.193
r = 2	14.868	20.261	r = 2	16.291	20.261
r = 3	5.605	9.145	r = 3	4.909	9.145

For the estimation of the VAR models, two lags (i = 2 in y_{t-i}) are used. r indicates the number of cointegrating vector. CV5 % indicates the critical values at 5% significance level. A constant is included in the model for cointegration.

Appendix B. Estimated elasticities by DOLS and immediate MPCs by Carroll, Otsuka, and Slacalek (2011)

Table B1
DOLS estimates. Total, financial and housing wealth.

Eq. (1)

Italy		UK	
Variables	coef [t-stat]	Variables	coef [t-stat]
Const	−1.059*** [−15.180]	Const	−0.673*** [−6.773]
$\log Y_t$	0.359*** [3.877]	$\log Y_t$	0.588*** [7.588]
$\log TW_t$	0.396*** [10.870]	$\log TW_t$	0.262*** [5.949]

Eq. (2)

Italy		UK	
Variables	coef [t-stat]	Variables	coef [t-stat]
Const	−0.515*** [−6.754]	Const	−0.427*** [−10.459]
$\log Y_t$	0.397*** [4.751]	$\log Y_t$	0.668*** [13.822]
$\log FW_t$	0.226*** [9.836]	$\log FW_t$	0.075*** [4.110]
$\log HW_t$	0.091** [2.488]	$\log HW_t$	0.142** [10.019]

4 lags and leads of the first difference of the regressors are used in the estimation of Eqs. (1)–(2).
***, **, and * denote significance at the 1%, 5% and 10% levels, respectively.

Table B2
Stickiness of consumption and immediate marginal propensity estimates. Total, financial and housing wealth.

Italy				UK			
χ		Total		χ		Total	
0.70***		0.001		0.65***		0.005***	
F-test (p-value)		4.06*** (0.002)		F-test (p-value)		6.56*** (0.000)	
Hansen J-test (p-value)		6.462 (0.167)		Hansen J-test (p-value)		0.165 (0.921)	

Italy				UK			
χ	Financial		Housing	χ	Financial		Housing
0.76***	0.005***		−0.001	0.80***	0.003***		0.004***
F-test (p-value)	3.470*** (0.003)			F-test (p-value)	9.85*** (0.000)		
Hansen J-test (p-value)	7.331 (0.197)			Hansen J-test (p-value)	1.306 (0.728)		

The estimation of consumption sluggishness in Eq. (3) uses instrumental variables method. As for Italy, the instruments involved are: housing wealth, financial wealth, disposable income growth rate, interest rate spread, nominal short interest rate, and changes in unemployment rate. As control variables in the OLS estimation of Eqs. (5)–(7), we consider disposable income growth rate, interest rate spread, and unemployment rate. For the UK, the instruments are housing wealth, financial wealth, interest rate spread and nominal short interest rate, while the control variables are interest rate spread and nominal short interest rate. F-test and Hansen tests are used for assessing instruments and overidentifying restrictions, respectively. *** denotes significance at the 1% level.

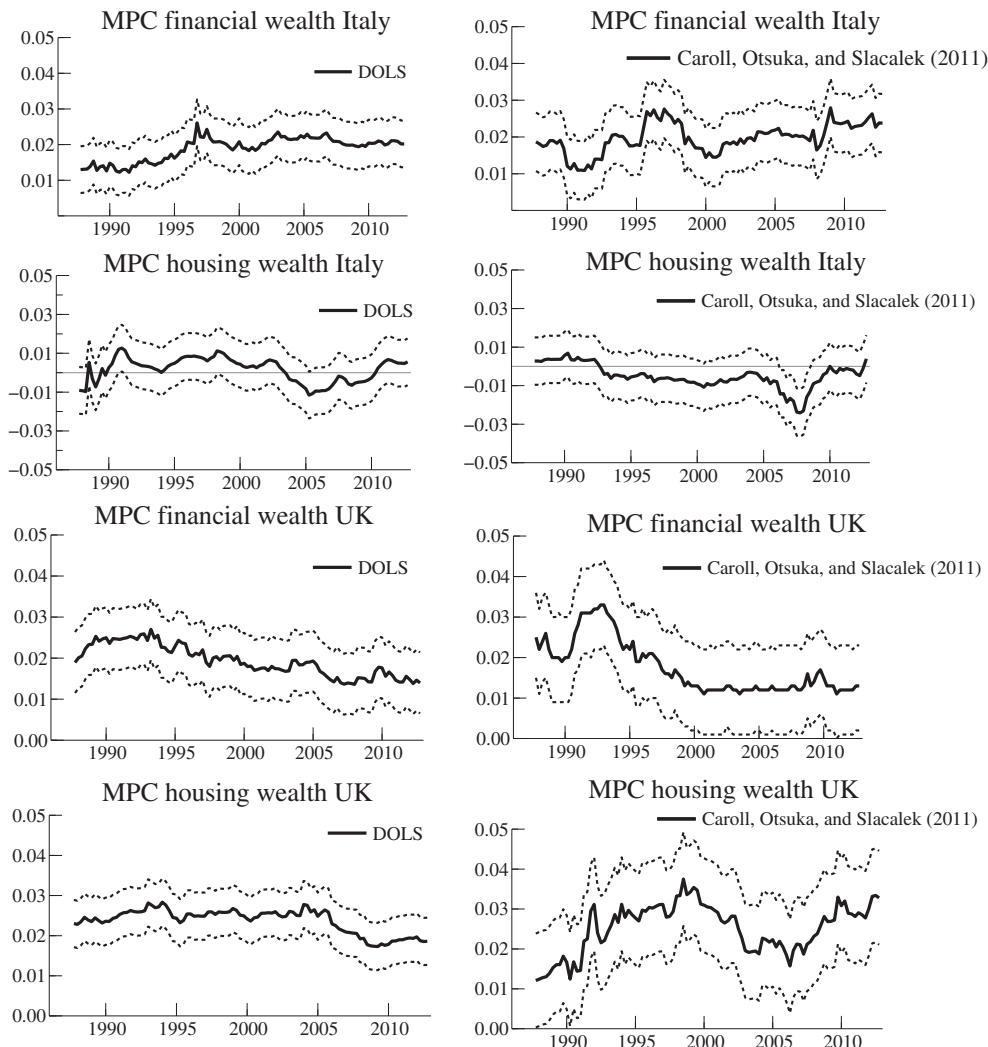## Appendix C. Rolling estimates for MPCs out of financial and housing wealth with 95% confidence interval

Fig. C1. Rolling estimates for MPCs out of financial and housing wealth. The dotted lines show the 95% confidence interval.

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