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NÚCLEO DE INVESTIGAÇÃO EM POLÍTICAS ECONÓMICAS

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URL:
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* NIPE – *Núcleo de Investigação em Políticas Económicas* – is supported by the Portuguese Foundation for Science and Technology through the *Programa Operacional Ciência, Teconologia e Inovação* (POCI 2010) of the *Quadro Comunitário de Apoio III*, which is financed by FEDER and Portuguese funds.

How do Consumption and Asset Returns React to Wealth Shocks? Evidence from the U.S. and the U.K.

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April 2010

Abstract

In this work, I analyze the response of consumption and asset returns to unexpected wealth variation. Using data at quarterly frequency for the U.S. and the U.K., I show that: *(i)* while housing wealth shocks have a very persistent effect on consumption, financial wealth shocks only have transitory effects; and *(ii)* similarly, unexpected variation in housing wealth delivers a reasonably persistent response of real returns while financial wealth shocks have just a temporary effect.

Keywords: financial wealth, housing wealth, consumption, asset returns.
JEL classification: E21, E44, D12.

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1. Introduction

There is a wide literature on the impact that wealth has on consumption (Case et al., 2005), and several explanations have been offered for the differences in its response to financial and housing wealth shocks, such as: *(i)* expected permanency of changes in asset prices; *(ii)* heterogeneity in the asset distribution across groups (Banks et al., 2004); *(iii)* housing as providing utility services or used for bequests (Poterba, 2000); *(iv)* liquidity (Pissarides, 1978; Muellbauer and Lattimore, 1999); *(v)* \`psychological factors' (Shefrin and Thaler, 1988); and *(vi)* wealth mismeasurement (Sousa, 2003).

Similarly, substantial research has documented long-term predictability of asset returns and the linkages between macroeconomic aggregates and wealth variables (Fama and French, 1988; Campbell and Shiller, 1988).

More recently, authors have developed empirical proxies that are able to track time-variation in asset returns. In this spirit, Sousa (2010) argues that wealth composition is a driving force of market risk premium. The author derives an equilibrium relation between the transitory deviation from the common trend in consumption, housing wealth, financial wealth and labour income and expected future asset returns, *cday*, and shows that it helps predicting future returns. The rationale for such finding is that: *(i) cday* is able to track changes in the wealth composition; and *(ii)* the coefficients of the cointegrating relationship in *cday* converge to the "long-run equilibrium" parameters at a faster rate.

In the current work, I look at the response of *both* consumption and asset returns to unexpected wealth variation. Specifically, I use data for the U.S. and the U.K. and the period 1975:1-2008:4, and show that: *(i)* housing wealth shocks have a persistent effect on consumption, but financial wealth shocks produce only temporary effects; and *(ii)* unexpected variation in housing wealth generates a persistent response on real returns, while financial wealth shocks have lead to transitory effects.

The rest of the paper is organized as follows. In Section 2, I present the data. In Section 3, I describe the model and discuss the results. Finally, in Section 4, I conclude.

2. Data

I use data at quarterly frequency for the U.S. and the U.K. and the sample period is 1975:1-2008:4. All variables are measured at constant prices and expressed in the logarithmic form of per capita terms.

For the U.S., I use data from the Flow of Funds Accounts of the Board of Governors of Federal Reserve System and the Bureau of Economic Analysis of the U.S. Department of Commerce. Consumption is defined as the expenditure in nondurable consumption goods and services excluding clothing and shoes. Data on wealth correspond to the end-of-period values, while data on income refer to labour income.

In the case of the U.K., data are taken from the Office for National Statistics (ONS), the Halifax plc, the Nationwide Building Society and the Office of the Deputy Prime Minister. Durable and semi-durable goods are excluded from the definition of consumption, while income and wealth' concepts are similar to those for the U.S..

Asset returns are computed using the U.S. and the U.K. Total Return Indexes of the Morgan Stanley Capital International (MSCI).

3. Empirical Methodology and Results

I estimate the following Bayesian Structural Vector Autoregressive Model (B-SVAR)

$$\mathrm{X_t} = \theta + \mathrm{A(L)X_{t\text{-}1}} + \zeta_t, \tag{1}$$

where $\mathrm{X_t} = (r_t, \Delta c_t, \Delta f_t, \Delta u_t, \Delta y_t)$ is the vector of real returns, consumption growth, financial wealth growth, housing wealth growth, and labour income growth, *A(L)* is a finite-order distributed lag operator, θ is a vector of constants, and ζ_t is a vector of error terms.

In order to assess the uncertainty about the posterior distribution of the impulse-response functions, I follow Zellner (1971), Schervish (1995) and Bauwens et al. (1999) and factorize the estimated VAR as the product of a multivariate normal distribution (conditional on the covariance matrix) and an inverse Wishart,

$$\beta|_{\Sigma} \sim \mathrm{N}(\hat{\beta}, \Sigma \otimes (X'X)^{-1}) \tag{2}$$

$$\Sigma^{-1} \sim Wishart((n\hat{\Sigma})^{-1}, n-m) \tag{3}$$

where β is the vector of VAR coefficients, Σ is the matrix of the variance-covariance of the residuals, *X* is the matrix of regressors, *n* is the sample size and *m* is the number of estimated parameters, and the variables with a hat denote estimates. Then, I compute 50,000 draws from the posterior distribution of the coefficients of the VAR and report

95 percent probability intervals generated via a Monte Carlo Markov-Chain (MCMC) algorithm.

Tables 1 and 2 present the results of the estimation of system (1) for the U.S. and the U.K., respectively.

Table 1 shows that the forecasting regression of real returns has no explanatory power. It can also be seen that asset returns are an important explanatory of financial wealth growth, as the coefficient associated to real returns is statistically significant. Moreover, the evidence supports the idea that a large component of the variation in financial wealth is transitory, given that the R^2 statistic of the corresponding equation is large (0.80). By its turn, the housing wealth growth equation confirms the persistence of this component of wealth: the lag of the dependent variable is highly significant and this equation explains 32% of the variation in housing wealth. These features corroborate the findings of Case and Shiller (1989) and Ortalo-Magné and Rady (2006), who highlight the strong autocorrelation of housing returns. The estimation of the consumption growth equation shows that: *(i)* it is predictable by its own lag, a sign of some delay in the adjustment process (Flavin, 1981; Campbell and Mankiw, 1989); and (ii) the lag of labour income growth also predicts consumption growth, suggesting the existence of habit-formation preferences or liquidity constraints.

Similar findings can be observed in Table 2. In fact, the lag of real returns does not help predicting future asset returns and variation in financial wealth is mainly transitory. In contrast, growth in housing wealth exhibits strong persistence.

Using the B-SVAR represented by (1), I also assess the change in consumption growth and future returns caused by shocks in the different components of asset wealth, that is, financial wealth and housing wealth.

Figure 1 reports the impulse-response functions of consumption growth and quarterly real returns to a one standard deviation impulse in, respectively, financial wealth and housing wealth in the case of the U.S.. Figure 2 replicates the findings for the the U.K.

Both Figures show that while housing wealth shocks have a very persistent effect on consumption, financial wealth shocks only have transitory effects. Similarly, unexpected variation in housing wealth delivers a reasonably persistent response of real returns while financial wealth shocks have just a temporary effect.

Table 1 – Estimates From the Bayesian Structural Vector-Autoregression (B-SVAR) Model: U.S. Evidence.

The table reports the estimated coefficients from the Bayesian Structural Vector-Autoregression (B-SVAR) specified in system (1). Symbols ***, **, and * represent, respectively, significance level of 1%, 5% and 10%. Newey-West (1987) corrected *t*-statistics appear in parenthesis. The sample period is 1975:1-2008:4.

	Equation				
Dep. Variable	r_t^{US}	Δc_t^{US}	Δf_t^{US}	Δu_t^{US}	Δy_t^{US}
r_{t-1}^{US}	-0.017	0.010**	0.288***	0.003	0.014
(t-stat)	(-0.190)	(2.465)	(21.789)	(0.184)	(1.596)
Δc_{t-1}^{US}	0.931	0.247***	0.358	-0.033	0.376**
(t-stat)	(0.462)	(2.790)	(1.209)	(-0.088)	(1.976)
Δf_{t-1}^{US}	0.149	-0.001	-0.014	-0.062	-0.056**
(t-stat)	(0.523)	(-0.047)	(-0.329)	(-1.167)	(-2.089)
Δu_{t-1}^{US}	-0.506	0.022	0.103*	0.510***	0.008
(t-stat)	(-1.213)	(1.204)	(1.673)	(6.577)	(0.198)
Δy_{t-1}^{US}	-1.817**	0.086**	0.024	0.596***	-0.281***
(t-stat)	(-2.124)	(2.296)	(0.190)	(3.752)	(-3.488)
θ	0.026**	0.004***	-0.001	0.001	0.004***
(t-stat)	(1.982)	(6.534)	(-0.404)	(0.525)	(2.871)
R^2	[0.01]	[0.17]	[0.80]	[0.32]	[0.12]

Table 2 - Estimates From the Bayesian Structural Vector-Autoregression (B-SVAR) Model: U.K. Evidence.

The table reports the estimated coefficients from the Bayesian Structural Vector-Autoregression (B-SVAR) specified in system (1). Symbols ***, **, and * represent, respectively, significance level of 1%, 5% and 10%. Newey-West (1987) corrected *t*-statistics appear in parenthesis. The sample period is 1975:1-2008:4.

	Equation				
Dep. Variable	r_t^{UK}	Δc_t^{UK}	Δf_t^{UK}	Δu_t^{UK}	Δy_t^{UK}
r_{t-1}^{UK}	-0.042	0.015*	0.504***	0.019	0.031***
(t-stat)	(-0.458)	(1.910)	(15.827)	(1.358)	(2.597)
Δc_{t-1}^{UK}	-0.960	-0.252***	0.767**	0.449***	-0.301**
(t-stat)	(-0.926)	(-2.723)	(2.109)	(2.876)	(-2.185)
Δf_{t-1}^{UK}	-0.008	0.006	0.050	0.004	0.013
(t-stat)	(-0.055)	(0.465)	(0.997)	(0.189)	(0.698)
Δu_{t-1}^{UK}	-0.210	0.064**	-0.246**	0.762***	0.154***
(t-stat)	(-0.635)	(2.166)	(-2.118)	(15.322)	(3.504)
Δy_{t-1}^{UK}	-0.080	0.104*	0.237	0.199**	-0.076
(t-stat)	(-0.123)	(1.780)	(1.035)	(2.031)	(-0.876)
θ	0.030***	0.005***	-0.001	-0.001	0.004***
(t-stat)	(2.989)	(6.124)	(-0.225)	(-0.477)	(3.322)
R^2	[0.00]	[0.07]	[0.68]	[0.70]	[0.11]

Figure 1. Impulse-Response Functions of Consumption and Real Returns (U.S. Evidence). The figure depicts the impulse-response functions of consumption and real returns to, respectively, a shock to financial wealth and housing wealth based on the Bayesian Structural Vector Auto-Regressive (B-SVAR) model estimated in system (1).

Response of Consumption	Response of Real Returns

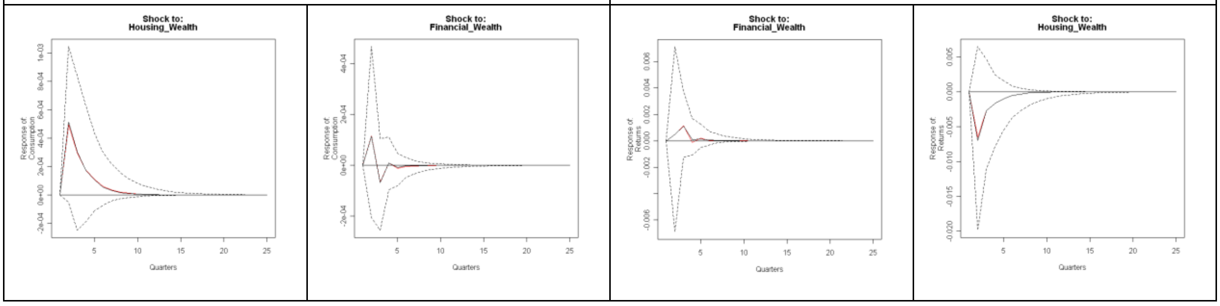
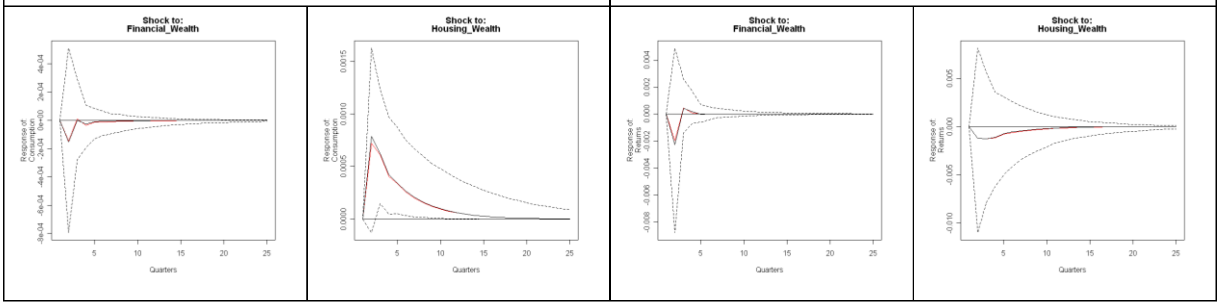


Figure 2. Impulse-Response Functions of Consumption and Real Returns (U.K. Evidence). The figure depicts the impulse-response functions of consumption and real returns to, respectively, a shock to financial wealth and housing wealth based on the Bayesian Structural Vector Auto-Regressive (B-SVAR) model estimated in system (1).

Response of Consumption	Response of Real Returns



4. Conclusion

This paper analyzes the response of consumption and asset returns to shocks to wealth. Using data at quarterly frequency for the U.S. and the U.K., I show that while housing wealth shocks have a very persistent effect on *both* consumption and asset returns, financial wealth shocks only produce transitory effects.

These results suggest that when consumption deviations from its equilibrium level are better understood as representing temporary movements in financial wealth. As for housing wealth changes, they do not explain the short-run dynamics but may impact on the long-run behaviour of consumption and asset returns. That is, the empirical findings suggest that not all components of asset wealth are transitory (as Lettau and Ludvigson (2001) argue), but only the financial wealth counterpart.

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