INTERNATIONAL MONETARY FUND

Feeling Rich, Feeling Poor: Housing Wealth Effects and Consumption in Europe

Serhan Cevik and Sadhna Naik

WP/23/256

WORKING PAPER

2023
DEC

 WP/23/256

IMF Working Paper

European Department

Feeling Rich, Feeling Poor: Housing Wealth Effects and Consumption in Europe

Prepared by Serhan Cevik and Sadhna Naik[1]

Authorized for distribution by Bernardin Akitoby

December 2023

Abstract

Households across Europe are struggling with a double crisis—the worst inflation shock since the World War II and a sudden correction in house prices. There is a rich literature on how housing price cycles affect consumer spending, finding mixed results with a wide range of consumption responses to changes in housing wealth. In this paper, using quarterly data on 20 countries in Europe over the period 1980–2023, we analyze the dynamic relationship between inflation-adjusted housing wealth and consumer spending and obtain statistically significant and economically intuitive results. Household consumption responds positively and swiftly to changes in real house prices and gross disposable income as expected. Using the estimated coefficients, we can deduce that the average quarter-on-quarter decline of -1.96 percent in real house prices in the first quarter of 2023 in Europe could dampen consumer spending by about -0.51 percentage points in real terms on a cumulative basis over a horizon of eight quarters.

JEL Classification Numbers:	C33; D12; D14; E21; E32; E44; E60; G15; R21; R30
Keywords:	House prices; wealth effects; consumer spending; Europe
Author’s E-Mail Address:	scevik@imf.org; snaik@imf.org

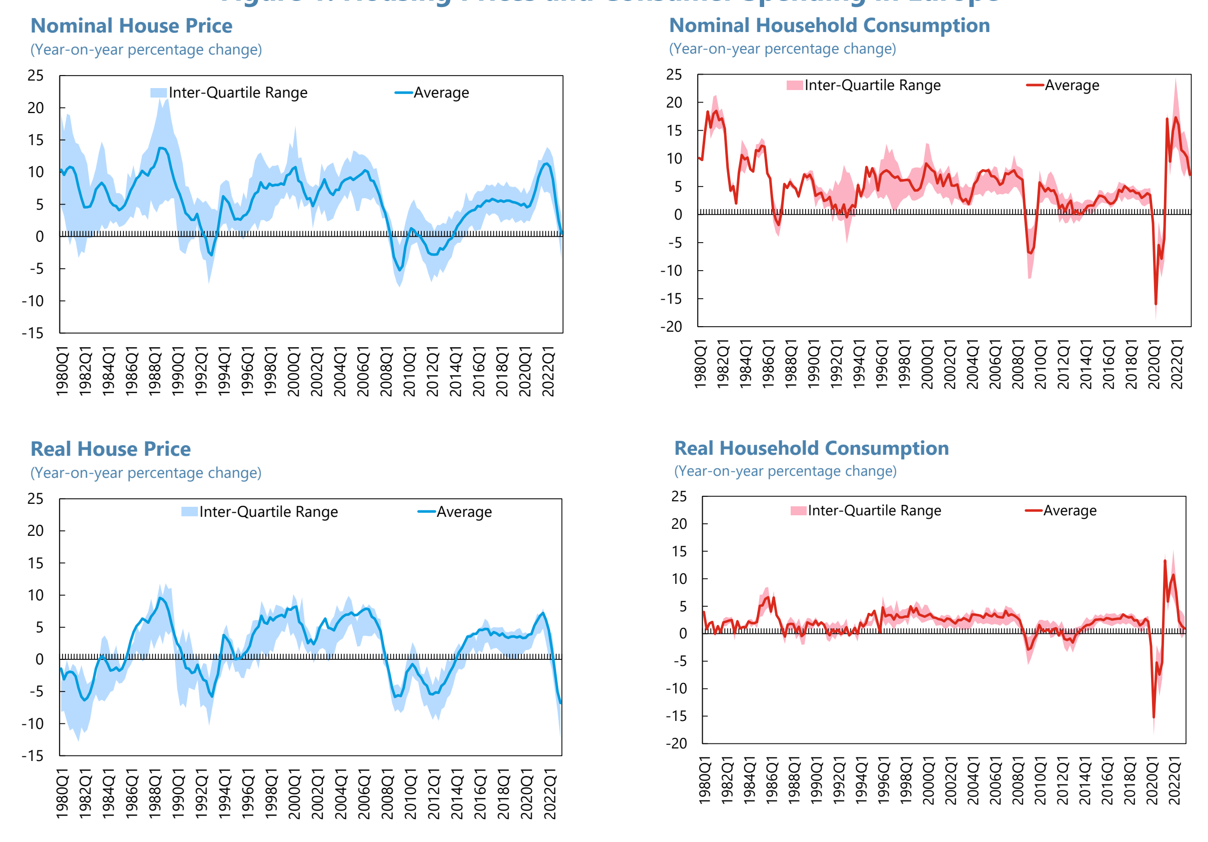
[1] The authors would like to thank Bernardin Akitoby, Helge Berger, Boris Balabanov, Alessia De Stefani, Vincenzo Guzzo and Cheryl Toksoz for their insightful comments and suggestions.

I. Introduction

Sweeping realignments in global financial markets have significant bearing on the housing market—the most important asset for households. The sudden and widespread surge in inflation after decades of price stability has forced central banks to tighten monetary policy. Higher interest rates and greater uncertainty have raised the cost of capital and put downward pressure on elevated asset prices, including housing. Since the global financial crisis (GFC) in 2008, house prices experienced an uninterrupted boom, albeit at varying magnitudes (Figure 1). The recent reversal of exceptionally easy financing conditions and a slowdown in income growth have recently weakened housing markets amid the worst cost of living crisis since the World War II. This double crisis could influence private consumption decisions through housing wealth effects, which may have long-lasting consequences for the business cycle (Mian, Rao, and Sufi, 2013; Kohlscheen, Mehrotra, and Mihaljek, 2020).

The state of the real estate market and consumer spending are intimately linked through changes in wealth effects on private consumption. Residential property accounts for, on average, about 55 percent of aggregate household wealth in Europe, but exhibits significant variation across countries (de Bondt, Gieseck, and Tujula, 2020). Therefore, housing price cycles influence the net worth of households more than any other financial factor. Taking into account

Figure 1. Housing Prices and Consumer Spending in Europe



Source: BIS; Eurostat; Haver Analytics; and authors' calculations.

fluctuations in income and wealth, consumers tend to smooth spending over time. Increasing (decreasing) house prices can stimulate (dampen) consumption by raising the level of household wealth and easing borrowing constraints.

In this paper, we provide new evidence on housing wealth effects on consumer spending in a panel of 20 European countries during the period 1980–2023. Using quarterly data and a panel vector autoregression (PVAR) model, we analyze the dynamic relationship between household consumption with housing price cycles and income growth and identify the shape and magnitude of these effects. Estimation results confirm that households consume more when house prices and income growth increase in real terms. However, the effects on consumer spending are short-lived and grow smaller over time. Quantitatively, using seasonally-adjusted quarter-on-quarter growth rates, we find that private consumption falls by 0.13 percentage points on average for one percent decrease in real house prices and 0.02 percentage points for a one percent decrease in real gross disposable income in the first quarter after the shock, plateauing after six and four quarters, respectively. Using the estimated coefficients, we can deduce that the quarter-on-quarter decline of -1.96 percent in real house prices in the first quarter of 2023 could dampen consumer spending by about -0.51 percentage points in real terms in our sample of European countries on a cumulative basis over a horizon of eight quarters. There is of course significant heterogeneity in downside risks across countries in Europe and the potential for an even larger slowdown in private consumption growth if households suffer real wealth destruction beyond the housing sector, with potential adverse implications for macro-financial stability.

The remainder of this paper is structured as follows. Section II provides an overview of literature. Section III describes the data used in the empirical analysis. Section IV explains the econometric methodology. Section V presents the findings. Finally, Section VI summarizes and provides concluding remarks.

II. LITERATURE REVIEW

The relationship between residential property prices and macro-financial factors is well documented in the literature. Cross-country studies across different groups of advanced and emerging market economies show strong linkages between macroeconomic and financial factors and the housing market. Over the long run, housing prices are found to be determined by a combination of demand-side factors (such as income and wealth, financial conditions, and demographic developments) and supply-side factors (such as the availability and state of housing units). A wide range of empirical studies has confirmed this relationship across different countries and over time. For example, analyzing housing prices in 6 advanced economies, Sutton (2002) finds that favorable macroeconomic conditions—captured by changes in income, interest rates and stock prices—have a significant effect on the evolution of housing prices, but the magnitude of change in housing prices tends to move beyond what is warranted by the underlying fundamentals. However, the estimated elasticity of house prices with respect to economic, financial and demographic factors show significant variation depending on the sample of countries, the time period, and the empirical methodology used in the analysis (Tsatsaronis and Zhu, 2004; Girouard *et al*., 2006; Adams and Füss, 2010; Agnello and Schuknecht, 2011; Cerutti, Dagher, and Dell'Ariccia, 2015).

There is also growing evidence from emerging market economies corroborating the impact of economic and financial factors on housing prices. Focusing on countries in Central and Eastern Europe (CEE), Égert and Mihaljek (2007) find that housing prices are determined by income per capita, real interest rates, credit availability, and demographic factors. Furthermore, the paper compares the impact of macro-financial factors on housing prices in the CEE region and advanced economies and obtains significant differences in the magnitude of various factors. Such findings are also highlighted by Ucal and Gökkent (2009) and Jianhua and Huidan (2013), who show that macroeconomic shocks play a large role in determining house prices in Turkey and China, respectively. Similarly, analyzing the boom-bust cycles in the former Soviet Union countries, Stepanyan, Poghosyan, and Bibolov (2010) show that house price developments are shaped by the dynamics of economic fundamentals, such as income growth, remittance flows, and external financing. More recently, Cevik and Naik (2023) implement a panel quantile regression approach to obtain a granular analysis of real estate markets in Europe and find that income growth and interest rates income growth matter more for higher housing prices than those at the lower quantiles of the property market.

The real estate market plays an important role in macro-financial developments through its multidirectional linkages. Looking at a sample of 17 advanced economies, Goodhart and Hofmann (2008) find a significant multidirectional relationship between housing prices, credit availability and the state of the economy, especially with the impact of shocks to money and credit stronger when house prices are on the rise. This analysis also shows the strengthening of these linkages during the period 1985–2006 in comparison to a longer sample dating back to the 1970s, reflecting the impact of structural reforms and improvements in credit infrastructure. Likewise, Davis and Zhu (2011) explore the linkages between property cycles and financial stability and find that macroeconomic shocks cause changes in bank lending and property prices in advanced economies. These results also suggest that the long-run impact of credit conditions on housing prices is time-varying and dependent on the country. Focusing on a sample of CEE and southeastern European countries, Huynh-Olesen *et al*. (2013) show that residential real estate prices moved beyond the level warranted by economic fundamentals prior to the GFC and declined below the equilibrium value afterwards. Kulikaukas (2016) reach similar conclusions in assessing the extent of valuation misalignment in the Baltic residential property markets.

Housing wealth is shown to have greater effects than the stock market wealth on consumer spending. Theoretical underpinning of the housing wealth effect are based on the permanent income theory (Friedman, 1957) and the life-cycle hypothesis (Ando and Modigliani, 1963), which state that household wealth is a key element for determining private consumption. From a macroeconomic perspective, Bertaut (2002), Bayoumi and Edison (2003), Case, Quigley, and Shiller (2005), Donihue and Avramenko (2006), Ciarlone (2011), Shen, Holmes, and Lim (2015), and Li and Zhang (2021) find a larger housing wealth effect than the impact of stock market wealth on household consumption. There are also studies using microeconomic data and reaching similar conclusions (Engelhardt, 1996; Muellbauer and Murphy, 1997; Yao and Zhang, 2005; Campbell and Cocco, 2007; Simo-Kengne, Gupta, and Bittencourt, 2013; Aladangady, 2017; Berger *et al*., 2018; Caceres, 2019; Zhang, 2019; Sun *et al*., 2022). These empirical findings are consistent with the fact that housing accounts for a significant share of total household net worth.

III. DATA OVERVIEW

The empirical analysis is based on a panel dataset of quarterly observations from 20 countries in Europe during the period 1980–2023.[2] The residential house price index is obtained from the Bank of International Settlements (BIS). For all countries in the sample, we use nationwide residential property in real terms adjusted for consumer price inflation. The BIS publishes more than 300 series from 61 countries in the detailed residential property price dataset, which differ significantly from country to country, varying in frequency, type of property, geographical coverage, price units, and method of compilation. In this paper, to facilitate cross-country comparison among 20 European countries over the period from the first quarter of 1980 to the first quarter of 2023, we use the harmonized series according to an internationally agreed framework for property prices (Eurostat, 2013). As presented in Table 1, the mean value of real house price growth is 0.44 percent per quarter (or 1.91 percent on an annualized basis) during the sample period, with a minimum of -9 percent and a maximum of 8 percent (or within an annualized range from -32 percent to 34 percent).[3] While housing price cycles appear to be synchronized across Europe, there is still considerable heterogeneity in the pace of upward momentum and the extent of downward correction.

The panel VAR model used in this paper includes three variables: real house prices, real household disposable income and real private consumption. These quarterly series are drawn from various sources, including BIS, Eurostat, and Haver Analytics and adjusted for seasonality. Similar to the behavior of house price cycles, summary statistics also show significant heterogeneity in household disposable income and private consumption across countries and over time. We test for cross-sectional dependence between the variables by applying the Pesaran(2004) cross-sectional dependence test and reject the null hypothesis of cross-sectional independence, which confirms that European counties in our sample are cross-sectionally correlated, as expected, due to similar institutions and policies, common external shocks, cross-border economic and financial spillovers, and unobservable factors. Accordingly, cross-sectional dependence is explicitly accounted for by transforming the data in deviations from the sample time averages (time demeaning). To determine the degree of integration and appropriately implement the PVAR model, it is necessary to analyze the time-series properties of the data by

[2] The countries in the sample are determined by the availability of quarterly data on three variables used in the analysis and include Austria, Belgium, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Netherlands, Norway, Poland, Portugal, Romania, Slovenia, Spain, Sweden, and the United Kingdom.

[3] Most European economies experienced large fluctuations in economic activity during the COVID-19 pandemic, with a deep collapse followed by a sudden surge, as shown by these figures.

conducting a series of panel unit root tests. We check the stationarity of all variables by applying the Im-Pesaran-Shin (2003) and Pesaran (2007) procedures, which are widely used in the empirical literature. These results, available upon request, indicate that the seasonally-adjusted quarterly series used in the analysis are stationary after logarithmic transformation and first differencing.

Table 1. Descriptive Statistics

Variable	Count	Mean	SD	Kurtosis	Min	Max
Quarter-on-Quarter Growth						
House Price Growth	1750	0.42	1.94	5.09	-9.48	7.74
Gross Disposable Income Growth	1710	0.30	2.49	7.01	-13.49	13.48
Consumption Growth	1750	0.37	2.57	35.19	-26.79	18.87

Source: Authors' calculations.

IV. ECONOMETRIC STRATEGY AND RESULTS

The empirical analysis presented in this study is based on a PVAR model of real house prices, household disposable income and private consumption. Our baseline model is based on a three-variable PVAR model of house prices, gross household disposable income and private consumption in real terms over a long period from 1980 to 2023 with several boom-bust cycles. The PVAR model consists of equations relating the current value of each variable to past values of all variables. We compute variance decompositions and impulse response functions (IRFs), using the approach proposed by Love and Zicchino (2006). This PVAR framework treats all variables as endogenous, controls for unobserved individual heterogeneity within the panel dataset by introducing fixed effects and estimates the coefficients using the generalized method of moments (GMM) method with lagged regressors as the instrumental variable. We specify a reduced-form PVAR model as follows:

$$y_{i,t} = \phi_0 + A(L)y_{i,t-1} + \eta_i + \upsilon_t + \varepsilon_{i,t}$$

where $y_{i,t}$ is a vector of three endogenous variables including real house prices, real household disposable income and real household consumption in a country i in period t. These quarterly series are seasonally adjusted, transformed in logarithms, and expressed in quarter-on-quarter growth rates. The matrix η_i is a set of country fixed effects, which capture the influence of time-invariant country-specific characteristics, υ_t denotes common time fixed effects, and $\varepsilon_{i,t}$ is a vector of error terms. L is the lag operator determined to according to the moment selection criterion for the GMM estimation developed by Andrews and Lu (2001), and $A(\cdot)$ is a polynomial matrix in L. The model and moment selection criteria (MMSC), reported in Table 2 for quarter-on-quarter growth rates, shows that the appropriate lag choice is 1 for the PVAR model with quarter-on-quarter growth rates and 5 for the PVAR model with year-on-year growth rates. The test statistics, such as the Hansen *J* statistic of overidentifying restrictions and the MMSC approach, yield comparable results for quarter-on-quarter growth rates but different lag choices for year-on-year growth rates. We prefer the MMSC statistic that is comparable to various commonly used maximum likelihood-based model-selection criteria, such as the Akaike information criteria and the Bayesian information criteria. Even so, we experiment with alternative lags and find that the choice of lag order does not significantly change the estimation results. The PVAR model has all eigenvalues within the unit circle, indicating that the estimated model is stable and the non-cumulative IRFs will converge to zero (Appendix Table A1 and A2). Stability implies that the PVAR model is invertible with an infinite-order vector moving average representation, which provides known interpretation to estimated IRFs and forecast-error variance decompositions.

Impulse responses describe the reaction of one variable to the innovations in another variable in the system, while holding all other shocks equal to zero. The actual variance–covariance matrix of the errors is unlikely to be diagonal, and therefore it is necessary to decompose the residuals to isolate shocks to one of the variables in the system. The usual convention is to adopt a particular ordering and allocate any correlation between the residuals of any two elements to the variable that comes first in the ordering. This procedure, known as Cholesky decomposition of variance–covariance matrix of residuals, is equivalent to transforming the system in a "recursive" VAR for identification purposes. The identifying assumption is that the variables that come earlier in the ordering affect the following variables contemporaneously, as well as with a lag, while the variables that come later affect the previous variables only with a lag. In other words, the variables that appear earlier in the systems are more exogenous and the ones that appear later are more endogenous.

In applying the VAR procedure to panel data, we need to impose the restriction that the underlying structure is the same for each cross-sectional unit. Since this constraint is likely to be violated in practice, one way to overcome the restriction on parameters is to allow for "individual heterogeneity" in the levels of the variables by introducing fixed effects, denoted by x_i in the model. Since the fixed effects are correlated with the regressors due to lags of the dependent variables, the mean-differencing procedure commonly used to eliminate fixed effects would create biased coefficients. To avoid this problem, we use forward mean-differencing, known as the 'Helmert procedure' that eliminates the fixed effect (Arellano and Bover, 1995).

Table 2. Optimal Lag Order: Quarter-on-Quarter Growth

Lag	CD	J	J p-value	MBIC	MAIC	MQIC
1	0.51	161.50	0.00	-418.65	-0.50	-157.45
2	0.55	140.77	0.00	-374.92	-3.23	-142.74
3	0.12	109.27	0.00	-341.96	-16.73	-138.80
4	0.07	81.48	0.01	-305.29	-26.52	-131.15
5	-0.04	59.27	0.08	-263.04	-30.73	-117.93
6	-0.77	52.65	0.04	-205.20	-19.35	-89.11
7	-8.23	16.77	0.94	-176.62	-37.23	-89.55
8	-13.48	7.32	0.99	-121.61	-28.68	-63.56

Source: Authors' calculations.

Furthermore, time fixed effects are also removed by subtracting the means of each variable calculated for each country–year. This transformation preserves the orthogonality between transformed variables and lagged regressors, so we can use lagged regressors as instruments and estimate the coefficients by the GMM method.[4] Finally, we calculate standard errors of IRFs and derive confidence intervals using Monte Carlo simulations.[5]

Estimation results confirm the significant influence of housing wealth and income growth on consumer spending in Europe. Figure 2 provides a visual presentation of the orthogonalized impulse responses of consumer spending, gross disposable income and housing prices (in real growth rates) to a positive one standard deviation shock (equivalent to a growth rate of 1.3 percentage points on average) in the previous quarter, together with corresponding 95 percent confidence intervals.[6] The estimated coefficients are statistically significant at the 1 percent level and economically intuitive. The focus of this paper is on the dynamic responses of consumer spending to a positive shock in housing prices and gross disposable income, which we present in a closeup in Figure 3. Real household consumption growth reacts positively and immediately to a one standard deviation shock to housing prices and gross disposable income. Quantitatively, using quarter-on-quarter growth rates, we find that a one standard deviation positive shock to real house price growth—equivalent to an increase of 1.3 percentage points on average—raises consumer spending by about 0.2 percentage points in the first quarter and 0.3 percentage points on a cumulative basis over the two-year period. The impact is, however, short-lived, as expected, and grows smaller over time, plateauing after six quarters. Consumer spending responds to changes in gross disposable income growth with a similar pattern. A one standard deviation positive shock to real gross disposable income growth—equivalent to an increase of 2.2 percentage points on average—boosts private consumption in real terms by about 0.04 percentage points in the first quarter and 0.03 percentage points on a cumulative basis over the two-year horizon.[7]

---

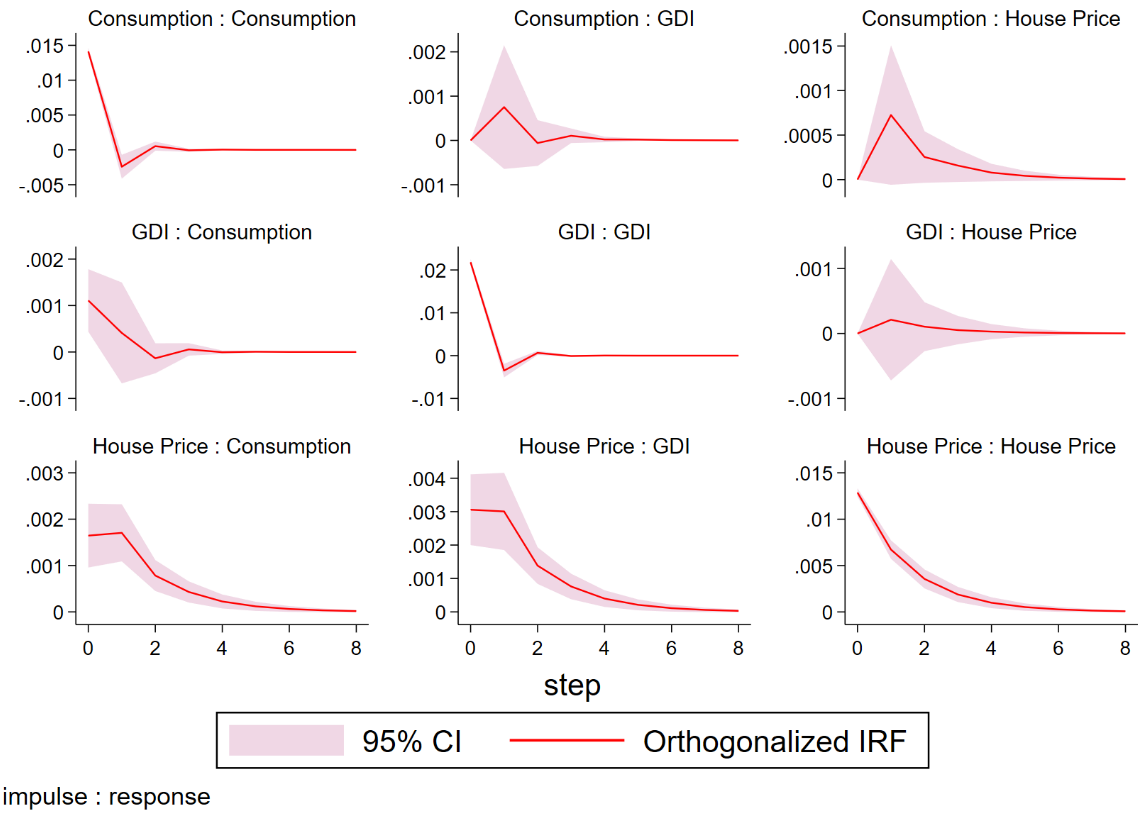
[4] The GMM approach also helps deal with the potential problem of serial correlation in the error term, especially when the model is estimated using year-on-year growth rates.

[5] We randomly generate a draw of coefficients β of the model using the estimated coefficients and their variance–covariance matrix and re-calculate the impulse-responses. We repeat this procedure 1,000 times and generate 5th and 95th percentiles of this distribution, which we use as the corresponding confidence interval for impulse responses.

[6] IRFs presented in this paper are non-cumulative, which can therefore be interpreted as the effect of the shock on other variables in a given period.

[7] We should note that these effects would vary significantly at the household level, depending on a multitude of factors including financial constraints, precautionary saving behavior, and changes in the ratio of mortgage payments to household income.

Figure 2. Impulse Response Functions: Q-on-Q Growth Rates



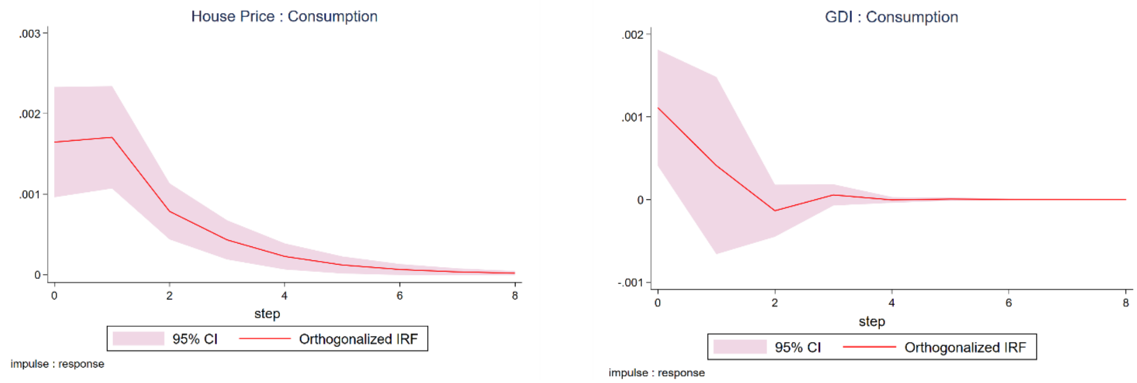
Note: The figure presents point estimates in red lines and 95 percent confidence intervals in pink.
Source: Authors' calculations.

These results are in line with the economic theory that households take into account fluctuations in house prices and income growth and smooth spending over time. Increasing (decreasing) house prices and gross disposable income can stimulate (dampen) consumption by raising the level of household income and wealth and easing borrowing constraints, especially in the short run.[8] Using the estimated coefficients, we can conclude that the seasonally-adjusted quarter-on-quarter decline of 1.96 percent in real house prices in the first quarter of 2023 could dampen consumer spending by about -0.51 percentage points, on average, in real terms on a cumulative basis over the next eight-quarter horizon. This is broadly consistent with previous studies[9] and the experience, for example in Spain and the Netherlands during the GFC, when the collapse in housing prices constrained consumer spending in the subsequent two-year period by 5 percent and 3 percent, respectively.

[8] These findings are also robust to a sample of only advanced economies in our sample as shown in Appendix Figures A1 and A2.

[9] de Bondt, Gieseck, and Tujula (2020) provide a comprehensive summary of wealth effect estimations in the Euro Area.

Figure 3. Housing Wealth and Income Effects on Consumer Spending



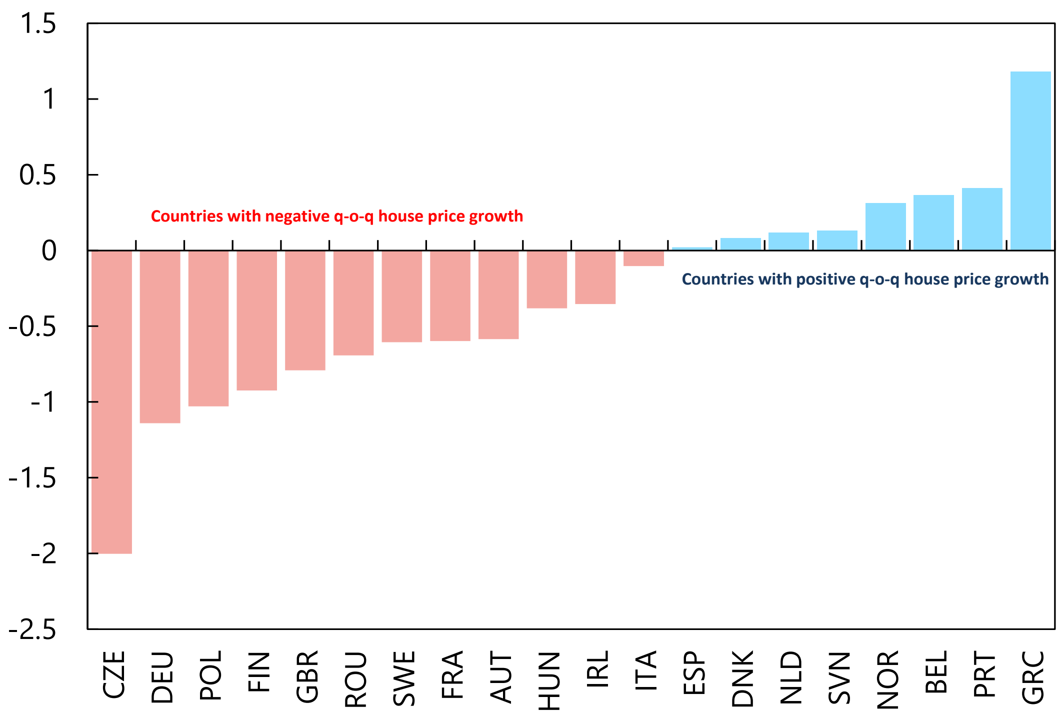
Note: The figure presents point estimates in red lines and 95 percent confidence intervals in pink.
Source: Authors' calculations.

V. Conclusion

The sudden and widespread surge in inflation after decades of price stability has forced central banks to tighten monetary policy. Higher interest rates and greater uncertainty have raised the cost of capital and put downward pressure on elevated asset prices, including the most important of all—housing. Since the GFC, housing prices experienced an uninterrupted boom across Europe, albeit at varying magnitudes. The recent reversal of exceptionally easy financing conditions and a slowdown in income growth, however, have weakened real estate markets amid the worst cost of living crisis since the World War II, depressing housing prices and dampening income growth.

The state of property markets and consumer spending are intimately linked through changes in wealth effects on private consumption. Real estate holdings are the main determinant of household wealth in Europe—as well as in the rest of the world. Residential property accounts for, on average, about 55 percent of aggregate household wealth in Europe, but exhibits significant variation across countries. This paper provides a dynamic analysis of housing wealth effects on consumer spending in a panel of quarterly observations on 20 European countries during the period 1980–2023 by implementing a PVAR model. Estimation results confirm that household consumption responds strongly to house price movements and disposable income growth in real terms. These effects on consumer spending are highly persistent, cumulatively amounting to 0.34 percentage points for housing prices and 0.03 percent for gross disposable income over the two-year period. Our seasonally-adjusted quarter-on-quarter estimations imply that the average decline of 1.96 percent in real house prices in the first quarter of 2023 could dampen consumer spending by about -0.51 percentage points in our sample of European countries on a cumulative basis over a horizon of eight quarters. As presented in Figure 4, there is significant heterogeneity in housing price cycles and the impact on private consumption across Europe. While some countries continue to experience positive growth rates, others face the potential for an even larger slowdown in consumer spending growth, especially if households suffer real wealth destruction beyond the housing sector, with potential adverse implications for macro-financial stability.

Figure 4. Impact of 2023Q1 Change in House Prices on Private Consumption
(Percentage points, over the next 2-year period)



Sources: Haver Analytics; and Authors' calculations.

REFERENCES

Adams, Z., and R. Füss (2010). "Macroeconomic Determinants of International Housing Markets," *Journal of Housing Economics*, Vol. 19, pp. 38–50.

Agnello, L., and L. Schuknecht (2011). "Booms and Busts in Housing Markets: Determinants and Implications," *Journal of Housing Economics*, Vol. 20, pp. 171–190.

Aladangady, A. (2017). "Housing Wealth and Consumption: Evidence from Geographically Linked Microdata," *American Economic Review*, Vol. 107, pp. 3415–3446.

Ando, A., and F. Modigliani (1963). "The 'Life Cycle' Hypothesis of Saving: Aggregate implications and Tests," *American Economic Review*, Vol. 53, pp. 55–84.

Andrews, D., and B. Lu (2001). "Consistent Model and Moment Selection Procedures for GMM Estimation with Application to Dynamic Panel Data Models," *Journal of Econometrics*, Vol. 101, pp. 123–164.

Arellano, M., and O. Bover (1995). "Another Look at the Instrumental Variable Estimation of Error Component Models," *Journal of Econometrics*, Vol. 68, pp. 29–51.

Bayoumi, T., and H. Edison (2003). "Is Wealth Increasingly Driving Consumption?" DNB Staff Reports No. 101 (Amsterdam: Central Bank of the Netherlands).

Berger, D., V. Guerrieri, G. Lorenzoni, and J. Vavra (2018). "House Prices and Consumer Spending," *Review of Economic Studies*, Vol. 85, pp. 1502–1542.

Bertaut, C. (2002). "Equity Prices, Household Wealth, and Consumption Growth in Foreign Industrial Countries: Wealth Effects in the 1990s," International Finance Discussion Papers No. 724 (Washington, DC: Board of Governors of the Federal Reserve System).

Burnside, C., M. Eichenbaum, and S. Rebelo (2011). "Understanding Booms and Busts in Housing Markets," NBER Working Paper No. 16734 (Cambridge, MA: National Bureau of Economic Research).

Caceres, C. (2019). "Analyzing the Effects of Financial and Housing Wealth on Consumption using Micro Data," IMF Working Paper No. 19/115 (Washington, DC: International Monetary Fund).

Campbell, J., and J. Cocco (2007). "How Do House Prices Affect Consumption? Evidence from Micro Data," *Journal of Monetary Economics*, Vol. 54, pp. 591–621.

Case, K., J. Quigley, and R. Shiller (2005). "Comparing Wealth Effects: The Stock Market versus The Housing Market," *Advances in Macroeconomics*, Vol. 5, pp. 1–34.

Cerutti, E., J. Dagher, and G. Dell'Ariccia (2015). "Housing Finance and Real-Estate Booms: A Cross Country Perspective," IMF Discussion Note No. 15/12 (Washington, DC: International Monetary Fund).

Cevik, S., and S. Naik (2023). "Don't Look Up: House Prices in Emerging Europe," *German Economic Review*, https://doi.org/10.1515/ger-2023-0015.

Ciarlone, A. (2011). "Housing Wealth Effect in Emerging Economies," *Emerging Markets Review*, Vol. 12, pp. 399–417.

de Bondt, G., A. Gieseck, and M. Tujula (2020). "Household Wealth and Consumption in the Euro Area," ECB Economic Bulletin No. 1/2020 (Frankfurt: European Central Bank).

Donihue, M., and A. Avramenko (2006). "Decomposing Consumer Wealth Effects: Evidence on the Role of Real Estate Assets Following the Wealth Cycle of 1990-2002," FRB Working Paper No. 15 (Boston: Federal Reserve Bank of Boston).

Égert, B., and D. Mihaljek (2007). "Determinants of House Prices in Central and Eastern Europe," *Comparative Economic Studies*, Vol. 49, pp. 367–388.

Engelhardt, G. (1996). "House Prices and Homeowner Saving Behavior," Regional Science and Urban Economics, Vol. 26, pp. 313–336.

Eurostat (2013). "Handbook on Residential Property Prices Indices (RPPIs)," Eurostat Methodologies and Working Papers No. 18/164 (Luxembourg: Eurostat).

Friedman, M. (1957). *A Theory of the Consumption Function* (Princeton, NJ: Princeton University Press).

Geng, N., (2018). "Fundamental Drivers of House Prices in Advanced Economies," IMF Working Paper No. 18/164 (Washington, DC: International Monetary Fund).

Girouard, N., M. Kennedy, P. van den Noord, and C. Andre (2006). "Recent House Price Developments: The Role of Fundamentals," OECD Economics Department Working Paper No. 475 (Paris: Organization for Economic Co-operation and Development).

Huynh-Olesen, D., K. Steiner, A. Hildebrandt, and K. Wagner (2013). "Residential Property Prices in Central, Eastern and Southeastern European Countries," *Focus on European Economic Integration*, Vol. 2, pp. 52–76.

Im, K., M. Pesaran, and Y. Shin, 2003, "Testing for Unit Roots in Heterogeneous Panels," *Journal of Econometrics*, Vol. 115, pp. 53–74.

Jianhua, G., and L. Huidan (2013). "Investigation of the Linkage Among China's Macroeconomy, Stock Market and Real Estate Market," *International Journal of Finance and Banking Studies*, Vol. 2, pp. 1–7.

Kohlscheen, E., A. Mehrotra, and D. Mihaljek (2020). "Residential Investment and Economic Activity: Evidence from the Past Five Decades," *International Journal of Central Banking*, Vol. 16, pp. 287–329.

Kulikaukas, D. (2016). "Fundamental Housing Prices in the Baltic States: Empirical Approach," *Baltic Journal of Economics*, Vol. 16, pp. 53–80.

Li, C., and Y. Zhang (2021). "How Does Housing Wealth Affect Household Consumption? Evidence from Macro-Data with Special Implications for China," *China Economic Review*, Vol. 69, 101655.

Love, I., and L. Zicchino, 2006, "Financial Development and Dynamic Investment Behavior: Evidence from Panel Vector Autoregression," *Quarterly Review of Economics and Finance*, Vol. 46, pp. 190–210.

Mian, A., K. Rao, and A. Sufi (2013). "Household Balance Sheets, Consumption, and the Economic Slump," *Quarterly Journal of Economics*, Vol. 128, pp. 1687–1726.

Muellbauer, J., and A. Murphy (1997). "Booms and Busts in the UK Housing Market," *Economic Journal*, Vol. 107, pp. 1701–1727.

Pesaran, M. (2004). "General Diagnostic Tests for Cross-Section Dependence in Panels," Cambridge Working Papers in Economics No. 435 (Cambridge: University of Cambridge).

Pesaran, M. (2007). "A Simple Panel Unit Root Test in the Presence of Cross-Section Dependence," *Journal of Applied Econometrics*, Vol. 27, pp. 265–312.

Shen, X., M. Holmes, and S. Lim (2015). "Wealth Effects and Consumption: A Panel VAR Approach," *International Review of Applied Economics*, Vol. 29, pp. 221–237.

Simo-Kengne, B., R. Gupta, and M. Bittencourt (2013). "The Impact of House Prices on Consumption in South Africa: Evidence from Provincial-Level Panel VARs," *Housing Studies*, Vol. 28, pp. 1133–1154.

Stepanyan, V., T. Poghosyan, and A. Bibolov (2010). "House Price Determinants in Selected Countries of the Former Soviet Union," IMF Working Paper No. 10/104 (Washington, DC: International Monetary Fund).

Sun, X., Y. Su, H. Liu, and C. Li (2022). "The Impact of House Price on Urban Household Consumption: Micro Evidence from China," *Sustainability*, Vol. 14, 12592.

Sutton, G. (2002). "Explaining Changes in House Prices," *BIS Quarterly Review*, September (Basel: Bank for International Settlements).

Tsatsaronis, K., and H. Zhu (2004). "What Drives Housing Price Dynamics: Cross-Country Evidence, *BIS Quarterly Review*, March (Basel: Bank for International Settlements).

Ucal, M., and G. Gökkent (2009). "Macroeconomic Factors Affecting Real Estate Markets in Turkey: A VAR Analysis Approach," *Briefing Notes in Economics*, Vol. 80, pp. 1–13.

Yao, R., and H. Zhang (2005). "Optimal Consumption and Portfolio Choices with Risky Housing and Borrowing Constraints," *Review of Financial Studies*, Vol. 18, pp. 197–239.

Zhang, L. (2019). "Do House Prices Matter for Household Consumption? Evidence from Dutch Administrative Data," CPB Discussion Paper (The Hague: CPB Netherlands Bureau for Economic Policy Analysis).

Appendix Table A1. Eigenvalue Stability Test: Q-o-Q Growth Rates

Eigenvalue		
Real	Imaginary	Modulus
0.5	0.0	0.5
-0.2	0.0	0.2
-0.1	0.0	0.1

Source: Authors' calculations.

All the eigenvalues lie inside the unit circle therefore passing the stability test.

Appendix Figure A1. Advanced Economies – Impulse Response Functions: Q-o-Q Growth