

A Housing Portfolio Channel of QE Transmission - Data and program description¹

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¹Any opinions expressed in this document represent the author's personal opinions and do not necessarily reflect the views of the Deutsche Bundesbank or its staff.

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1 Data Sources

1.1 Deutsche Bundesbank’s Panel on Household Finances (PHF)

The primary dataset for this paper is the Deutsche Bundesbank’s Panel on Household Finances (PHF). Specifically, we use data from the first three survey waves: 2011 (wave 1, <https://DOI10.12757/Bbk.PHF.01.04.01>), 2014 (wave 2, <https://DOI10.12757/Bbk.PHF.02.04.01>), and 2017 (wave 3, <https://DOI10.12757/Bbk.PHF.03.02.01>). The PHF is the German module of the Eurosystem Household Finance and Consumption Survey. The data was accessed at the Deutsche Bundesbank Research Data and Service Center (RDSC) via on-site use (Project Number: 2020/0107) and is confidential, so we cannot provide the original datasets directly.¹ However, researchers can apply for access to PHF datasets for research and replication purposes.

To quantify the extent to which QE and portfolio rebalancing also affect the number of apartment units on the market (and not just prices, rents, and returns), we also use regional listing data, which we aggregate from Immoscout 24, the largest German online real estate listing platform. We use Immoscout 24 versions 10.7807/`immo:red:wk:suf:v5` for “flats for sales”, and 10.7807/`immo:red:wm:suf:v5` for “flats for rent.” For more information, see Breidenbach and Schaffner (2020).

1.2 Additional Data

The PHF survey data is supplemented with macro datasets from various sources. Our main additional source is the German proprietary provider, Bulwiengesa AG, from which we employ price, rent, and rental yield indexes, etc., for all 401 administrative regions of Germany. Table 1 offers an overview and a brief description of these datasets along with their respective sources. Column (4) indicates whether the data are confidential or can be provided. Table 1 provides a comprehensive overview of the key variables that we computed based on these datasets.

¹In addition to the standard scientific use files, we require anonymous information regarding the household’s region at the Kreis level (comparable to the US county level). This additional data necessitates stricter confidentiality measures, permitting the data to be used exclusively on-site.

Name of Dataset code	Content	Source	Confidential
citydata.dta	To explore the implications of our channel for housing outcomes, we employ price, rent, rental yield indexes, etc. for all 401 administrative regions of Germany	INKAR (BBSR) and Bulwiengesa AG (Table 2 and additionally in BBK environment)	Yes
JSTdatasetR6, macrohistory_deu.dta	Show time series of German asset payoffs and run present value identity regressions at the national level (Figure A4, Table A6)	Jorda (2017), Jorda (2019)	No, available on website of referenced authors
Housing_Regional.dta	To run value identity regressions at the regional level (Table A7)	Bulwiengesa AG	Yes
Macro Data_2025	Descriptive yearly statistics on German macro indicators	ECB, Destatis, Eurostat	No, attached in replication package
Data_A1A3.xlsx	Macro Indicators (Figure A1 and A2)	World Economic Outlook Database, Deutsche Bundesbank, ECB	No, attached in replication package
QEUupdated_monthly.dta	Balance Sheet variables (Figure A2)	ECB	No, attached in replication package
housingwealth_ecb.dta	Contains quarterly housing wealth data used for Figure A5	ECB	No, attached in replication package
HP quarterly.dta	Quarterly Real House Price Index for Figure A5	FRED	No, downloadable on website https://fred.stlouisfed.org
MPshocks_final.dta	Euro are monetary policy shocks for Figure A5	ECB	No, available on website of referenced authors
exposure data.dta	Country-specific refugee information for Figure A5	World Bank Database	No, downloadable on website

Table 1 Dataset Information

2 Processing and Final Data

The master file “*0_master.do*” provides instructions for replicating all files, including path specifications and the execution of each do-file mentioned below. The Stata do-file “*1_data_preparation_PHF*” prepares the survey data starting from the initial raw data. The files “1_a” – “1_f” are subfiles and imbedded in “*1_data_preparation_PHF*” and prepare additional household variables. The Stata do-file “*2_1_empirical_analysis_phf.do*”, “*2_2_empirical_analysis_regional.do*”, and “*3_empirical_analysis_ext_data.do*” include the code for the empirical analysis.

Table 2 VARIABLE DEFINITIONS AND SOURCES

Variable	Definition	Unit	Source
$\Delta HOUSING$	A household's change in housing wealth over the total portfolio size	%	PHF
$\Delta SEC.HOUSING$	A household's change in other (non-main residence) housing wealth over the total portfolio size ^a	%	PHF
$\Delta UNITS$	A household's change in the number of houses other than main residence	-	PHF
$\Delta STOCKS$	A household's change in directly and indirectly held stocks over the total portfolio size	%	PHF
Bonds	A household's share of bond holdings over the total portfolio value ^b	%	PHF
Deposits	A household's share of deposit value over the total portfolio size	%	PHF
Income	A household's total net income divided by the number of household members	-	PHF
Net Worth	A household's value of total assets less the outstanding liabilities	ln(x)	PHF
Members	The number of household members	-	PHF
Age	The household head's age	-	PHF
Risk Aversion	=1 if a household's self-reported degree of risk aversion is larger than the in-sample median	0/1	PHF
Church	=1 if the head of the household is a member of a church	0/1	PHF
Financial Advice	=1 if household received an investment recommendation by their principal bank	0/1	PHF
Financial Literacy	Classification on how financially literate a household is based on three simple questions ^c	0/1/2/3	PHF
Renter	=1 if the household is a renter in the main residence	0/1	PHF
Young Age	=1 if household head is below the age of 40	0/1	PHF
Middle Age	=1 if household head is between the age of 40 and 60	0/1	PHF
Older Age	=1 if household head's age is above 60	0/1	PHF
Interest Rate Exp.	A household's interest rate expectation 12 months ahead	%	PHF
$\Delta MortgageCredit$	A household's change in the logarithm of mortgage credit	%	PHF
Mortgage to Housing	Value of mortgage credit over the total housing value	%	PHF
Rental Yield	Region-level rent-to-price ratios	%	Bulwiengesa AG, Riwis 2022
Price Growth	Region-level cumulative real house price growth	2009=100	Bulwiengesa AG, Riwis 2022
Rent Growth	Region-level cumulative real rent growth	2009=100	Bulwiengesa AG, Riwis 2022
Sale Listings	Region-level number of sale listings on Immoscout 24	-	Immoscout 24
Rental Listings	Region-level number of rental listings on Immoscout 24	-	Immoscout 24
Sale/Rental Listings	Region-level ratio of sale over rental listings	-	Immoscout 24
Share of Refugees	2008 Regional share of refugees over total German refugees, multiplied by the share of refugees housed in independent accommodation	%	See Bednarek et al., 2020
Share of Renters	Regional share of people renting their main residence	%	Census 2011
Refugee/Pop	Regional share of refugees to the total population	%	INKAR and see Bednarek et al., 2020
QE	Total debt securities held by the ECB over nominal GDP	%	ECB
Post	=1 after the ECB adopts QE in January 2015	0/1	PHF

^aThroughout the paper, the total portfolio size is calculated as the sum of housing and all financial assets. For robustness, we also scale other housing wealth by the sum of bonds, deposits, and housing only, in line with our theoretical model.

^bWe use three different bond share measures. The first calculates the share of bond value (both directly held and indirectly via insurance and mutual funds) in the total portfolio (housing and all financial assets). As data on direct bond holdings are missing for most households, we impute these values by replacing missing values with the average bond holdings in the corresponding net wealth decile. The second measure does not apply this imputation. Measure three only includes households' direct bond holdings and hence does not contain their indirect holdings.

^cFinancial literacy is measured based on three questions on the difference between real and nominal interest rates, compound interest, and portfolio diversification. The three questions are: 1) Let us assume that you have a balance of 100 in your savings account. This balance bears interest at a rate of 2% per year and you leave it for 5 years on this account. How high do you think your balance will be after 5 years? 2): Let us assume that your savings account bears interest at a rate of 1% per year and the rate of inflation is 2% per year. Do you think that in one year, the balance on your savings account will be the same as, more than, or less than today? 3) Do you agree with the following statement: "Investing in shares of one company is less risky than investing in a fund containing shares of similar companies?"

3 Computational Requirements

All data preparation and analysis were done using Stata Version 18.²

4 Data Availability

- ☐ All data are publicly available.
- ☒ Some data cannot be made publicly available.
- ☐ No data can be made publicly available.

The PHF, Immoscout and Buwiengesa data cannot be shared publicly due to copyright restrictions imposed by the owners. Interested users may apply to gain access to the data.

5 Statement about Rights

- ☒ I certify that the author(s) of the manuscript have legitimate access to and permission to use the data used in this manuscript.

²StataCorp. 2023. Stata Statistical Software: Release 18. College Station, TX: StataCorp LLC. The packages “*reghdfe*” (Correia, 2017) is being used and needs to be installed for replication.

References

- [1] Altavilla, Carlo, Luca Brugnolini, Refet S Gürkaynak, Roberto Motto, and Giuseppe Ragusa, ‘Measuring euro area monetary policy’, *Journal of Monetary Economics*, 2019, 108, 162-179.
- [2] Bednarek, Peter, Daniel Marcel te Kaat, Chang Ma, and Alessandro Rebucci, ‘Capital flows, real estate, and local cycles: Evidence from German cities, banks, and firms’, *Review of Financial Studies*, 2021, 34 (10), 5077-5134.
- [3] Breidenbach, Philipp and Sandra Schaffner, ‘Real estate data for Germany (RWI-GEO-RED)’, *German Economic Review*, 2020, 21 (3), 401-416
- [4] Jordà, Òscar, Katharina Knoll, Dmitry Kuvshinov, Moritz Schularick, and Alan M Taylor, ‘The rate of return on everything, 1870-2015’, *Quarterly Journal of Economics*, 2019, 134 (3), 1225-1298
- [5] Jordà, Òscar, Moritz Schularick, and Alan M Taylor, ‘Macrofinancial history and the new business cycle facts’, *NBER Macroeconomics Annual*, 2017, 31 (1), 213-263
- [6] Correia, Sergio, (2017), ‘reghdfe: Stata module for linear and instrumental-variable/GMM regression absorbing multiple levels of fixed effects’, *Statistical Software Components s457874*, Boston College Department of Economics.