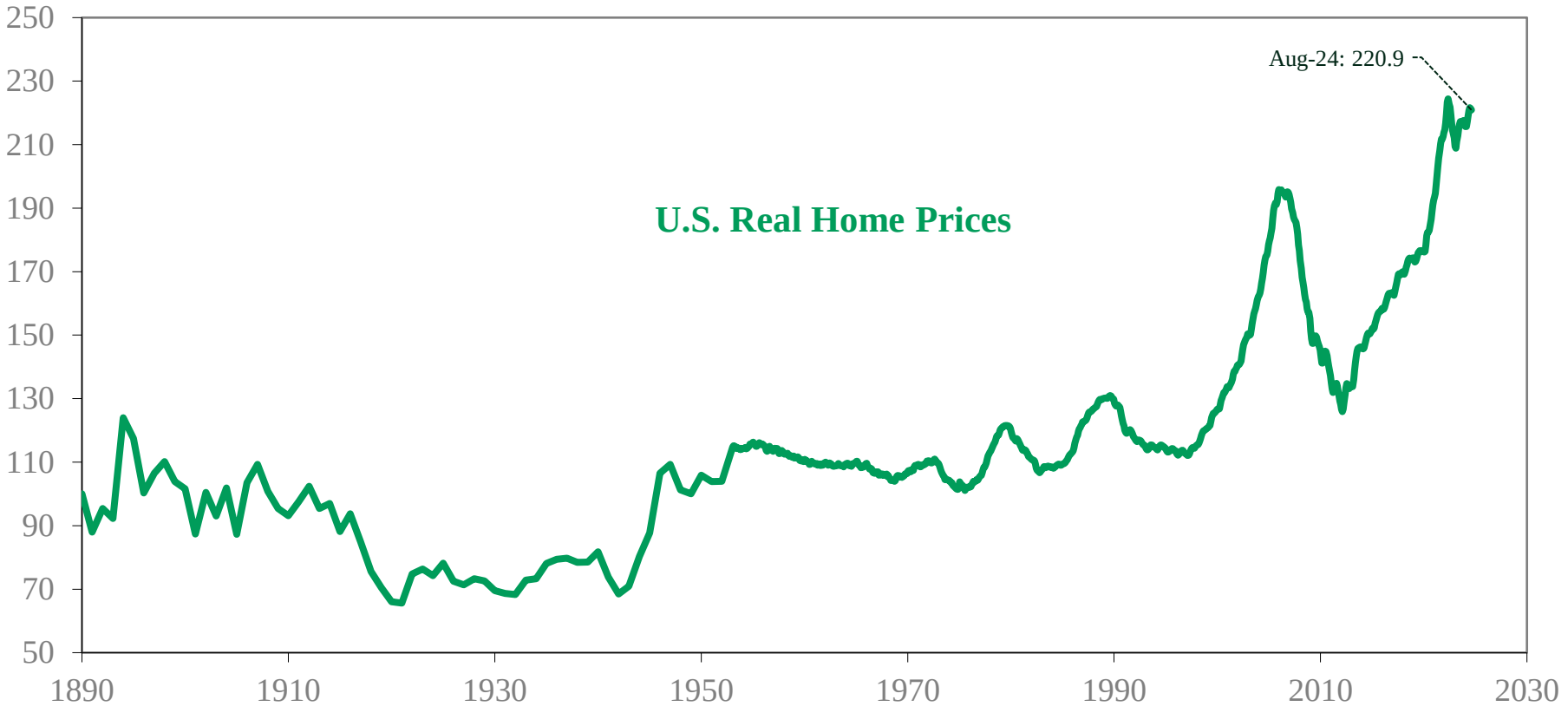
Housing Returns and the Emergence of the Safe Asset, 1465-2024

Paul Schmelzing
Boston College, and Hoover Institution Stanford

Hoover EPWG
November 20, 2024

MOTIVATION I: THE NEVER-ENDING HOUSING BOOM?

- The 1990-2000s home price boom was blamed on baby boomers, low rates, and financial innovation.
- Yet, as of Q3:2024, we are back above 2006 peaks in real terms.
- Are the early 2000s "unprecedented"? Are the 2020s? So far, we can't really tell.
- Shiller (2015 and 2024) suggests "stagnant" price dynamics pre-1970, and dates house price boom inception in 1997-9.



Source: Shiller (2024 and 2015, Figure 3.1).

Motivation II and literature

- Knoll, Schularick (2019) – global house price boom from 1970s. Prior "stagnant" era.
- Kuvshinov et al. (2019) – housing beats equities over long-run.
- Country-level – Chambers et al (2021), Eichholtz et al. (2021) – properly measured, housing does not beat equities. But there are "reach for yield" interactions with sovereign rates in 16th / 17th centuries (Korevaar 2021).
- Shiller (2015) – not much action in housing pre-1970.

  income growth beats house price growth by definition

- Issues
  - Radical simplifications in existing pre-1914 data sets. (Knoll – single city, substantial gaps, ignoring expenditure).
  - Shiller (2015) pre-1930 relies on Grebler, Blank, and Winnick (1956), which is 1934 survey-based data, asking homeowners to estimate current home values.
  - Much criticism of JST approach – how does housing really perform in relative terms.
  - Methodologically, not clear that even 100-150 years of data gives sufficient econometric power (RRS, 2024).
    - That concerns housing in particular: with depreciation rates around 1%, highly long-lived asset.
  - Leaps in empirical situation for associated variables (income, real rates, inflation) that interact with housing.
    - Post-Maddison leap in national accounting; financial variables (Schmelzing 2025).

NEW DATA: HÄUSERBÜCHER.

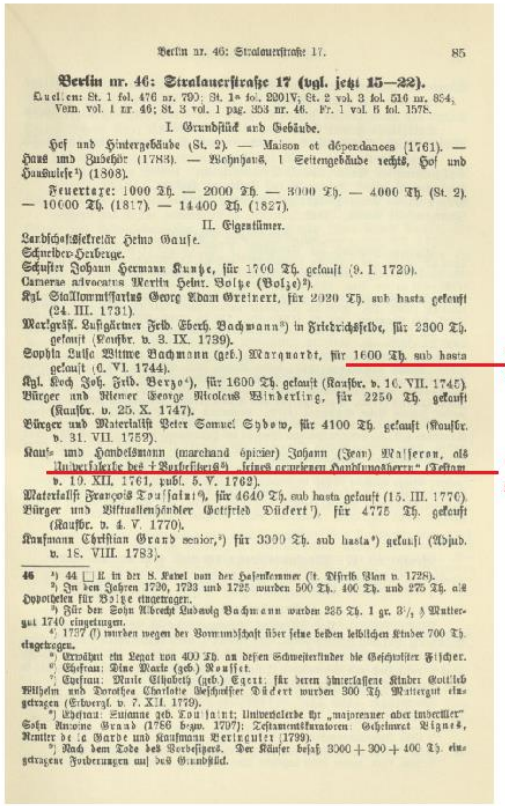
1. Major advances in digitization and urban topography over most recent years.
   - E.g. "TOPO N" project in Nuremberg – 4,000 property level chronologies with sales, ownership, quality change histories.
   - Starting in 1400s – average of 226 property years per house, up to 490 years.
   - Fusion with older compilations, resulting in thousands of

"TOPO N" Project by the Archive of Nuremberg, 2024 screenshot for house "B 3/4", Unterer Bergauerplatz 10.

Google Streetview, *Unterer Begauerplatz* Nuremberg, screenshot November 15, 2024.

NEW DATA: HÄUSERBÜCHER.

1. Fusion with printed compendia from *Historical School* era – including Berlin, Munich, Erfurt.
   - Property level data on ownership history, foreclosure sales (*sub hasta*), death of owner, assessment values, non-sale transactions, mortgage LTV.
   - Not a "big data" exercise per se, but more than 31,000 property-level years as of now.



Berlin nr. 46: Stralauerstraße 17. 85

Berlin nr. 46: Stralauerstraße 17 (vgl. jetzt 15–22).

Quellen: St. 1 fol. 476 nr. 790; St. 1ª fol. 2201V; St. 2 vol. 3 fol. 516 nr. 864; Verm. vol. 1 nr. 46; St. 3 vol. 1 pag. 353 nr. 46. Fr. 1 vol. 6 fol. 1578.

I. Grundstück und Gebäude.

Hof und Hintergebäude (St. 2). — Maison et dépendances (1761). — Haus und Zubehör (1783). — Wohnhaus, 1 Seitengebäude rechts, Hof und Hausbrunnen[1]) (1808).

Feuertaxe: 1000 Th. — 2000 Th. — 3000 Th. — 4000 Th. (St. 2). — 10000 Th. (1817). — 14400 Th. (1827).

II. Eigentümer.

Landschaftssekretär Heino Gause.
Schreiber-Herberge.
Schuster Johann Hermann Kunze, für 1700 Th. gekauft (9. I. 1720).
Camerae advocatus Martin Heinr. Bolte (Bolz[e])[2]).
Kgl. Stallommissarius Georg Adam Greinert, für 2020 Th. sub hasta gekauft (24. III. 1731).
Mez[gräfl.] Lustgärtner Feld. Eberh. Bachmann[3]) in Friedrichsfelde, für 2300 Th. gekauft (Kaufbr. v. 3. IX. 1739).
Sophia Luise Witwe Bachmann (geb.) Marquardt, für 1600 Th. sub hasta gekauft (2. VI. 1744).
Kgl. Koch Joh. Frid. Berzo[w][4]), für 1600 Th. gekauft (Kaufbr. v. 16. VII. 1745).
Bürger und Klemer George Nicolaus Winderling, für 2250 Th. gekauft (Kaufbr. v. 25. X. 1747).
Bürger und Materialist Peter Samuel Sydow, für 4100 Th. gekauft (Kaufbr. v. 31. VII. 1759).
Kauf- und Handelsmann (marchand épicier) Johann (Jean) Maisseron, als Universalerbe des † Bankiers G[...] „eines gewesenen Handlungsherrn" (Testam. v. 10. XII. 1761, publ. 5. V. 1762).
Materialist François Toussaint[5]), für 4640 Th. sub hasta gekauft (15. III. 1770).
Bürger und Viktualienhändler Gottfried Dückert[6]), für 4775 Th. gekauft (Kaufbr. v. 4. V. 1770).
Kaufmann Christian Grand senior,[7]) für 3390 Th. sub hasta[8]) gekauft (Adjud. v. 18. VIII. 1783).

46 [1]) 44 □R ist der 8. Kawel von der Hafenkammer (v. Pfeils Plan v. 1728).
[2]) In den Jahren 1720, 1723 und 1725 wurden 500 Th., 400 Th. und 275 Th. als Hypotheken für Bolze eingetragen.
[3]) Für den Sohn Albrecht Ludwig Bachmann wurden 285 Th. 1 gr. 8/9 ₰ Muttergut 1740 eingetragen.
[4]) 1737 (!) wurden wegen der Vormundschaft über seine beiden leiblichen Kinder 700 Th. eingetragen.
[5]) Erwähnt ein Legat von 400 Th. an dessen Schwesterkinder die Geschwister Fischer.
[6]) Ehefrau: Dine Marie (geb.) Rousset.
[7]) Ehefrau: Marie Elisabeth (geb.) Egert; für deren hinterlassene Kinder Gottlieb Wilhelm und Dorothea Charlotte Beschnitter Dückert wurden 300 Th. Muttergut eingetragen (Erbvergl. v. 7. XII. 1779).
[8]) Ehefrau: Suzanne geb. Toussaint; hinterließ ihr „majorenne aber imbecille" Sohn Auguste Grand (1766 bezw. 1797); Testamentsexekutoren: Geheimrat Vignes, Ämter de la Garde und Kaufmann Bertenuter (1799).
[9]) Nach dem Tode des Vorbesitzers. Der Käufer besaß 3000 + 300 + 400 Th. eingetragene Forderungen auf das Grundstück.

"sub hasta gekauft" = foreclosure sale June, 1744

"als Universalerbe" = non-sales transaction May 1762

Blumenstraße

Blumenstraße Nr. 18a

Kataster-Nr. 1052

Quellen.
Stadt GB Bd. 4 S. 1130
Hypoth.B Bl. 4 1045
GB Bd. [illegible]

H.-Nr. 18a wird im Jahre 1881 von St. Jakobsplatz Nr. 8, dessen Rückgebäude es bildet, abgetrennt.

1881 vor:
Fuchsmühler Peter, Privatier und Hausbesitzer.

1882 Juni 13:
Pierpéz Michael und Viktoria, Weinwirtseheleute.
Kaufsumme: 50000 M.

1897 August 24:
Brunnthaler Johann und Martina, Kaufmannseheleute.
Kaufsumme: 66000 M.

"Wertanschlag" = assessment value

1901 April 6
Dichtl Peter und Anna, geb. Reitel, Weinwirtseheleute, je 1/2 Anteil.
Kaufmüller Maximiliana, Witwe und Alleineigentümerin.
Kaufsumme: 71000 M.

1905 Februar 10:
Dichtl Peter, Witwer, 1/4 Anteil,
Dichtl Anna, Fritz und Lorenz, dessen Kinder, je 1/4 Anteil.
Erbschaft.

"Erwerb bei Zwangsversteigerung" = foreclosure sale

1907 Juni 11:
Dichtl Peter, Weinwirt und Alleinbesitzer.

1910 September 22:
Seiraud Michael und Emilie, Schneidermeisterseheleute.
Tausch, Wertanschlag: 238000 M.

1913 November 22:
Dichtl Peter und Anna, Weinwirtseheleute, gemeinsame Eigentümer.

1923 Februar 6:
Wihsner Alfons, Privatier in Matrei, Tirol.
(GB: 1923, Februar 15.)

1923 August 31:
Obrecer Natalis, Kaufmann und Bürgermeister in Matrei, 1/2 Anteil,
Lechner Herbert, Kaufmann in Hall (Tirol), 1/2 Anteil.
(GB: 1923 August 21.)

1952 September 30:
Teller Joseph, Direktor in Bozen, 1/2 Anteil.
Lechner Herbert, 1/2 Anteil.
(GB: 1952 Oktober 8.)

Extracts from Berlin Hausbuch (Lüdicke 1933), and Munich Hausbuch (Burgmaier 1966).

NEW DATA: HÄUSERBÜCHER.

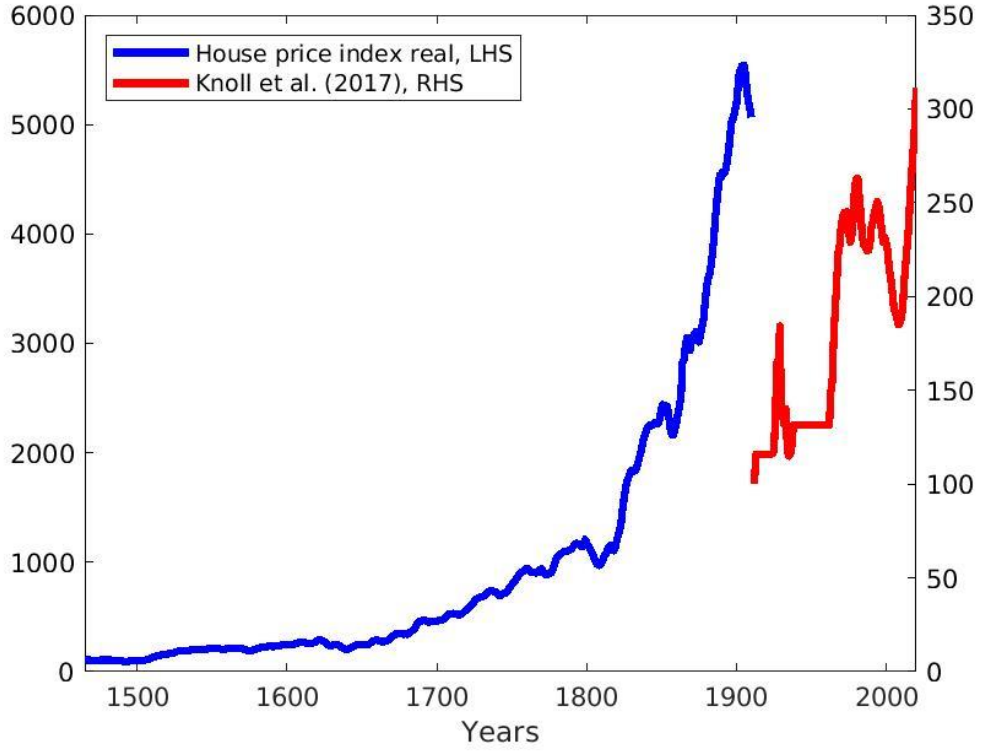
1. Transaction level data over time enables repeat-sales index for metropolitan German regions.
   - Homeowners make on average 90% in nominal terms upon sale (median: 32%).
   - Holding periods are decreasing over time – secular trend –, but remain elevated relative to alternative assets.

Transaction level	# of transactions	Avg sales gain %	Median sales gain %	Avg holding period
1300-1910	841	86.3	32.0	33.8
1500-1850	679	84.6	31.6	36.4
1700-1850	426	83.7	31.5	37.0
1800-1943	320	105.0	34.3	27.2
Modern U.S. equivalent, 2024			55.6	8.1

Note: The table reports summary statistics for market sales transactions of houses in the sample. Average and median price columns record price increase (decrease) relative to most recent previous recorded sales price, in nominal terms. Average holding period in years. Modern U.S. equivalent figures are via ATTOM 3Q:2024 market report, referring to U.S. nationwide sales.

A NEW REPEAT-SALES INDEX: GERMANY, 1465-2024.

- Once the serious data deficiencies in existing indices are remedied, secular picture for housing looks very different.
- Little evidence of a "stagnant" market prior to 1970s – in fact housing is booming, across variety of plausible methodologies.
- Even conservative approach suggests house prices tripled in real terms between Westphalian Peace and French Revolution, then rose in by another 3.5x between the Congress of Vienna and World War One alone.



Notes: The plot depicts the new German house price index, in real terms (blue, LHS, using the Pfister 2022 inflation adjustment). This index is shown in context to the Knoll (2017) real house price index for Germany over 1910-2017, in red (RHS, here 1910=100).

Fire sales

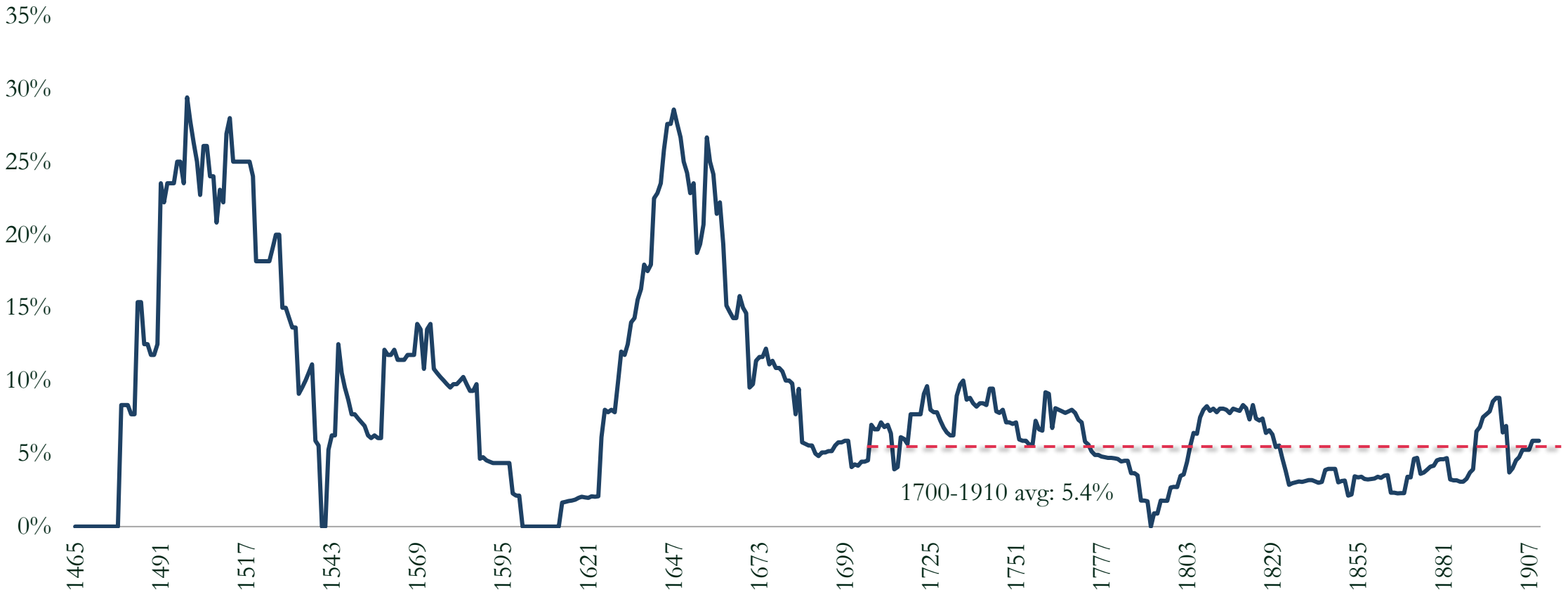
- Fire sale frequency (nominal terms): spikes in 1490s, 1630s, Napoleonic Wars, and 1890s.
- Generally appears that geopolitical / macro risks are main driver for property-level tail events. War = material destruction.
- "Normal" level stands at 7-10%. By ca. 1700, fire sale risk has "normalized".
- Campbell et al. (2011): Massachusetts 1987-2009 average 6.1% foreclosure frequency.

Fire sales

- Fire sale frequency (nominal terms): spikes in 1490s, 1630s, Napoleonic Wars, and 1890s.
- Generally appears that geopolitical / macro risks are main driver for property-level tail events. War = material destruction.
- "Normal" level stands at 7-10%. By ca. 1700, fire sale risk has "normalized".
- Campbell et al. (2011): Massachusetts 1987-2009 average 6.1% foreclosure frequency, 2009 peak 28.5%.

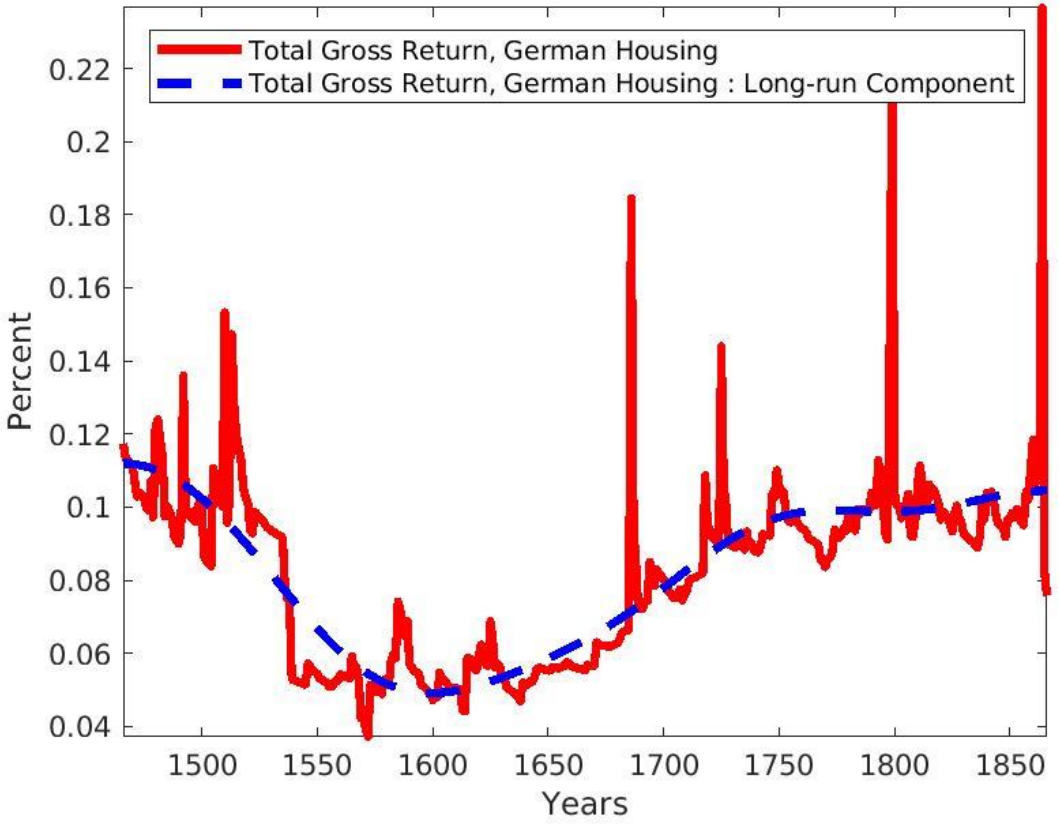
Fire sales

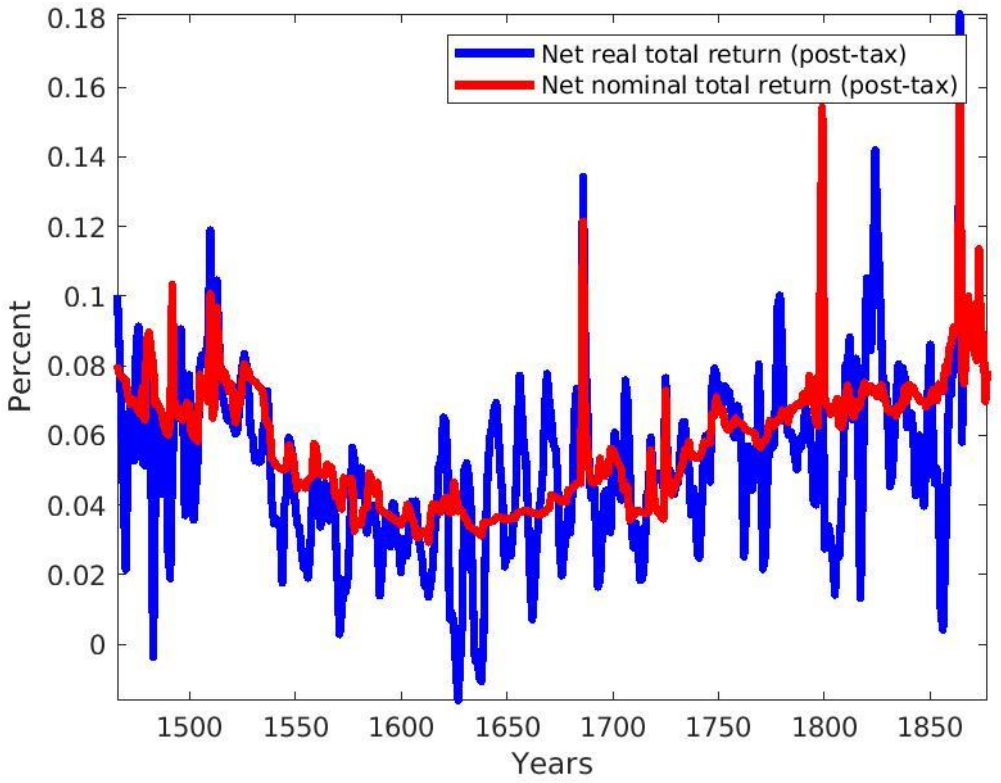
- Fire sale frequency (nominal terms): spikes in 1490s, 1630s, Napoleonic Wars, and 1890s.
- Generally appears that geopolitical / macro risks are main driver for property-level tail events. War = material destruction.
- "Normal" level stands at 7-10%. By ca. 1700, fire sale risk has "normalized".
- Campbell et al. (2011): Massachusetts 1987-2009 average 6.1% foreclosure frequency.



TOTAL (PRE-TAX) RETURNS – A SECULAR U-SHAPE 1465-1910.

- Secular U-shape in gross / excess returns. All-time average 8.2% gross nominal, 5.8% net nominal.
- Total gross return incorporates housing capital gain + rental income. Net return uses expenditure, tax data.
- 18 and 19th century terminal values (6.6%) very close to 21st century estimates (Ilmanen 2020 – U.S. real housing tr 6.1%, 1960-2020).

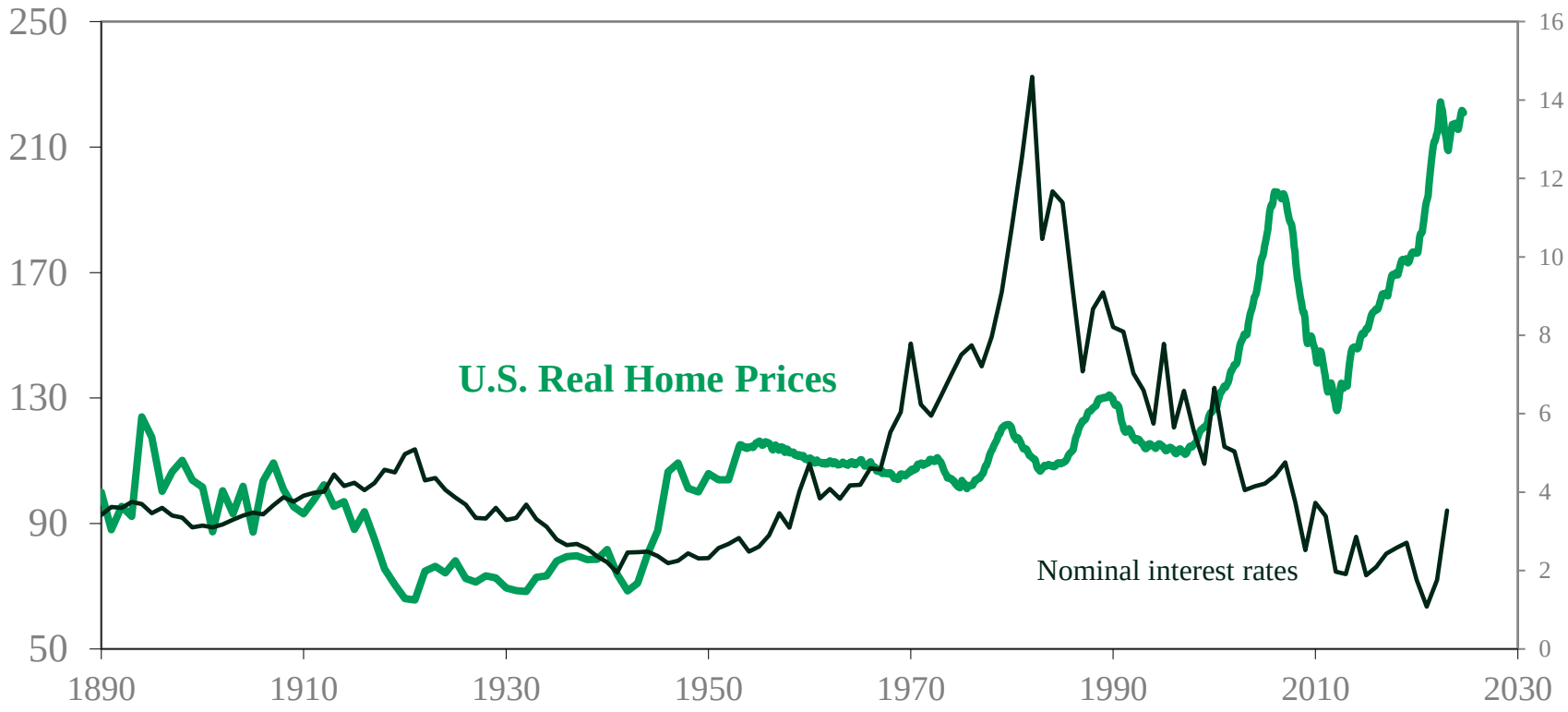




Notes: LHS Figure displays gross total returns of German housing (pre-tax, but post all expenditures), in nominal terms. Blue dashed line represents long-run component of excess returns using methodology of Mueller-Watson (2018). RHS displays net returns, nominal and real, after expenditures and taxes. Progressively lagged inflation via Schmelzing (2025) is used.

DRIVERS: CREDIT SUPPLY, AND RATES.

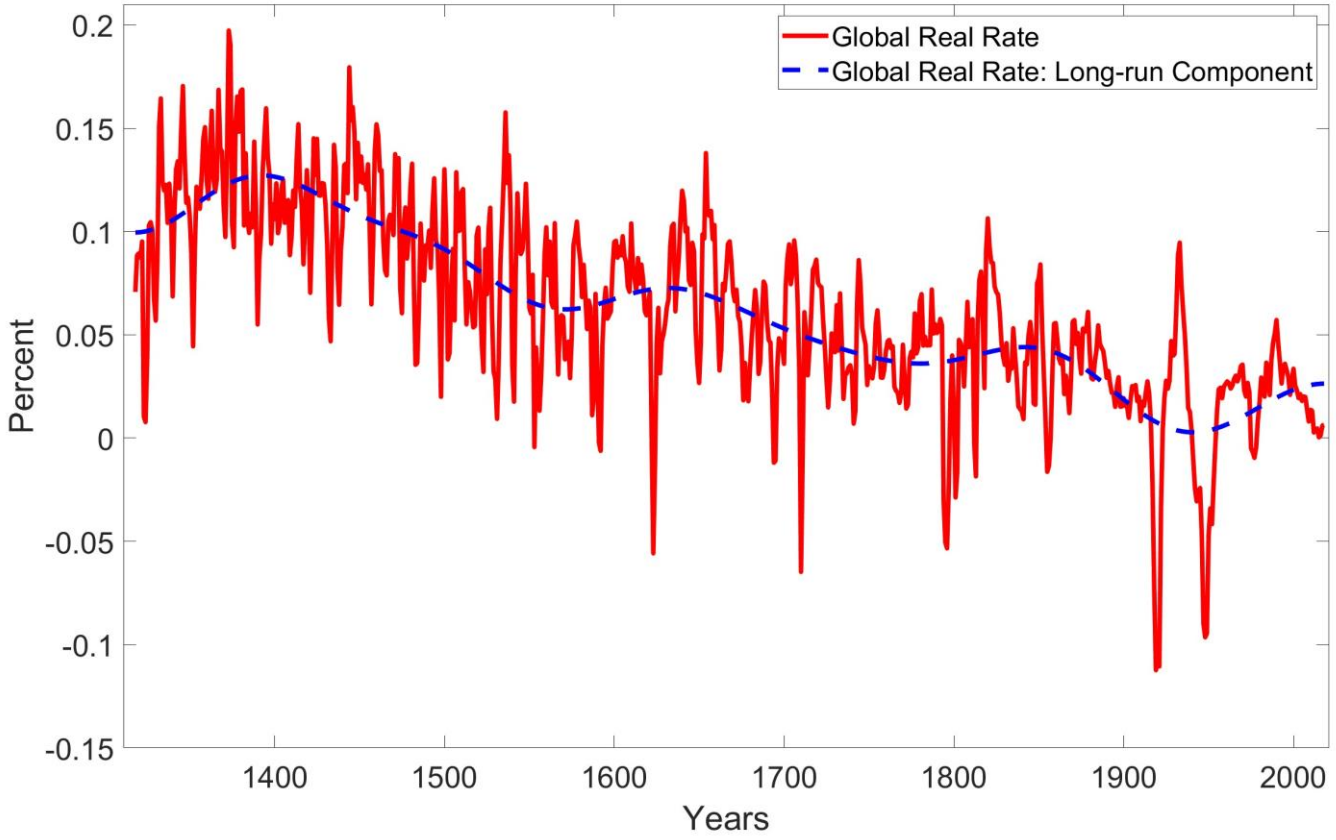
- 2000s housing boom is often causally linked to credit supply.
- Justiniano et al. (2019): "An increase in credit supply driven by looser lending constraints in the mortgage market is the key force behind…the unprecedented rise in home prices, the surge in household debt, [and] the stability of debt relative to house values".



Source: Shiller (2015, Figure 3.1).

Real global sovereign rates – 1311-2022.

- Sovereign real rates are trend stationary, with major break around 1557. Thus leading private rates?
- 1980s look far less "special" in long-run context (as does 1914). Half-lives are reasonably low. Is that also true for real mortgage rates?
- Both markets are liquid, and with meaningful portfolio/wealth weights over centuries. Real estate + land = 55%, public private debt 25-30%.



Notes: Figure displays real long-maturity mortgage rates for eight advanced economies, arithmetically weighted (AW), inflation adjusted with seven-year progressively lagged realized inflation. See construction details in Schmelzing (2025). Blue dashed line represents long-run component of excess returns using methodology of Mueller-Watson (2018).

MORTGAGES: THE WORLD'S OLDEST INVESTABLE ASSET CLASS.

- What role for credit?
- Suggestive that Case and Shiller (1989) speculated that real rate trends could be driving U.S. house price predictability.
- Strong recent claims for credit supply drivers in, e.g., Justiniano et al. (2019) for U.S. housing boom.

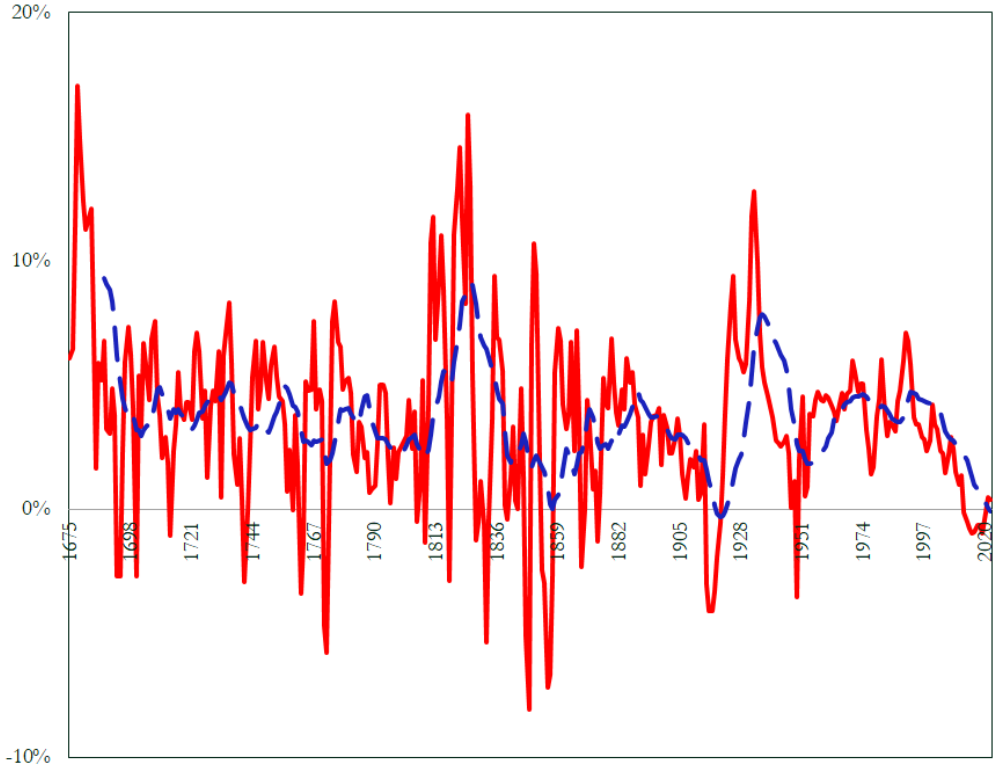
- "Cleopha Mayerin zu Pfullendorf on the debtor side, borrows from the monastery of Pfullendorf…for interest at 5 in the hundred", April 30, 1624.

Contract held in the archives of the *Archbishopric Freiburg, Erzbischöfliches Archiv Freiburg.*

Notes: The image displays a mortgage contract dated April 30, 1624. It is part of the mortgage rate sample over 1311-2024 in Schmelzing (2025). The contracting parties are Cleopha Mayerin zu Pfullendorf on the debtor side, and the monastery of Pfullendorf on the creditor side. Contract held in the archives of the Archbishopric Freiburg, Erzbischöfliches Archiv Freiburg, Urkundensammlung Haid UH095, in: Monasterium.net, URL </mom/DE-EAF/Haid/UH095/charter>, accessed November 11, 2024.

Real German mortgage rates – 1675-2024.

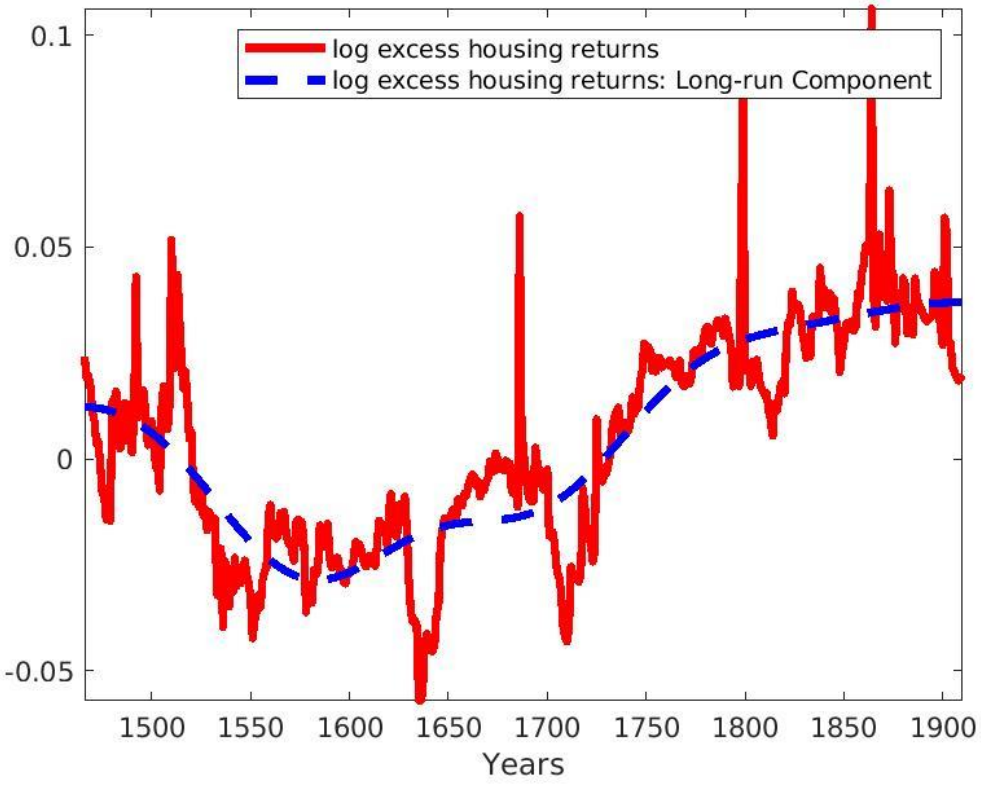
- Indeed, real mortgage rates are downward trending for centuries, echoing sovereign real rates.
- ADF-GLS: trend stationarity, low half-lives, few structural breaks (1666, 1799).



Notes: Figure displays real long-maturity mortgage rates for Germany, inflation adjusted with seven-year progressively lagged realized inflation. See construction details in Schmelzing (2025). Blue dashed line represents long-run component of excess returns using methodology of Mueller-Watson (2018).

EXCESS HOUSING RETURNS – IN THE MAKING SINCE CA. 1650.

- So are excess returns. 0.4% ER all-time; 3.1% ER over 1750-1910.
- Note flattening of excess returns approx. 1750, following decline in fire sale risk. JST 2000-2020: 3.1% German er.
- Secular "reach for yield" unfolding? E.g. Korevaar (2021). Alternative: repression dynamics?



Notes: Figure displays log excess returns of German housing (pre-tax, but post all expenditures), over German long-maturity government assets (also pre-tax). Blue dashed line represents long-run component of excess returns using methodology of Mueller-Watson (2018).

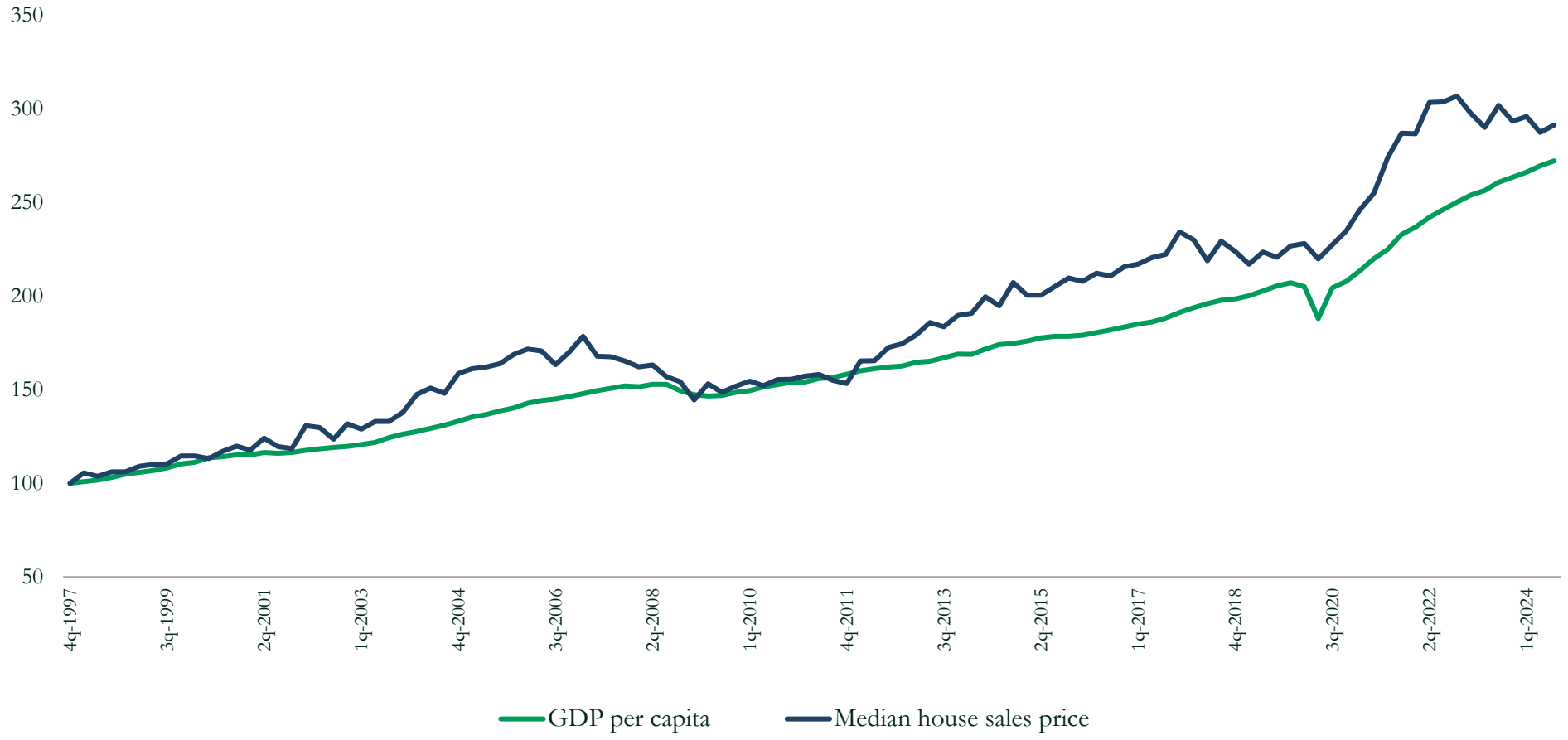
Does income outpace house price growth?

- "Reflections from casual observation ought to convince us that homes have not appreciated significantly over the decades...real home price growth must have been less than real per capita disposable income growth, which was 2.0% a year from 1929 to 2013. The bottom line appears to be that, while there is some uncertainty about the actual path of home prices, most of the evidence points to disappointingly low average rates of real appreciation of most homes...Actually, the theoretical argument that home prices can be expected to appreciate faster than consumer prices in general is not strong."

  Shiller, *Irrational Exuberance* (2015).

Does income outpace house price growth?

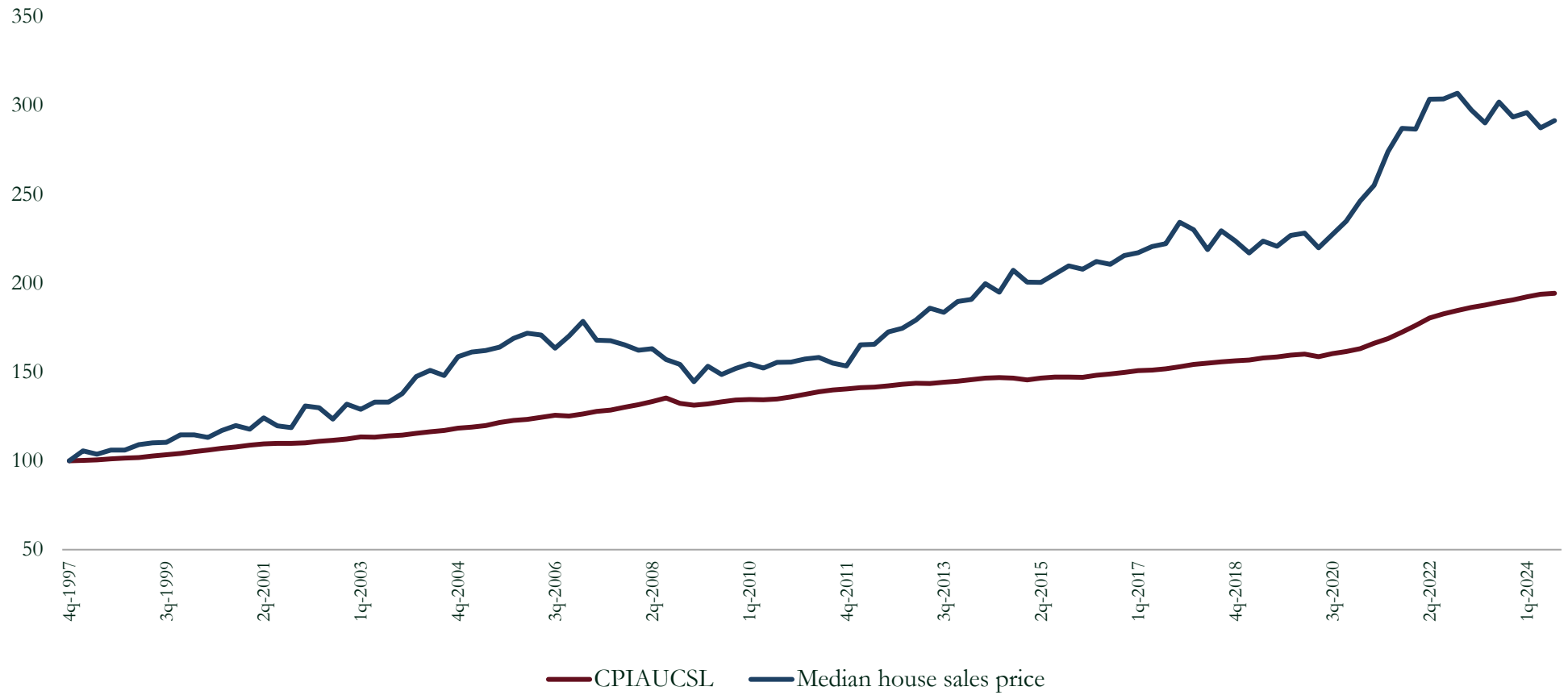
- "Reflections from casual observation ought to convince us that homes have not appreciated significantly over the decades...real home price growth must have been less than real per capita disposable income growth, which was 2.0% a year from 1929 to 2013. The bottom line appears to be that, while there is some uncertainty about the actual path of home prices, most of the evidence points to disappointingly low average rates of real appreciation of most homes...Actually, the theoretical argument that home prices can be expected to appreciate faster than consumer prices in general is not strong."



Notes: Figure displays indexed U.S. GDP per capita and median house sales price, quarterly basis. Retrieved via FRED. 4Q:1997=100.

Does income outpace house price growth?

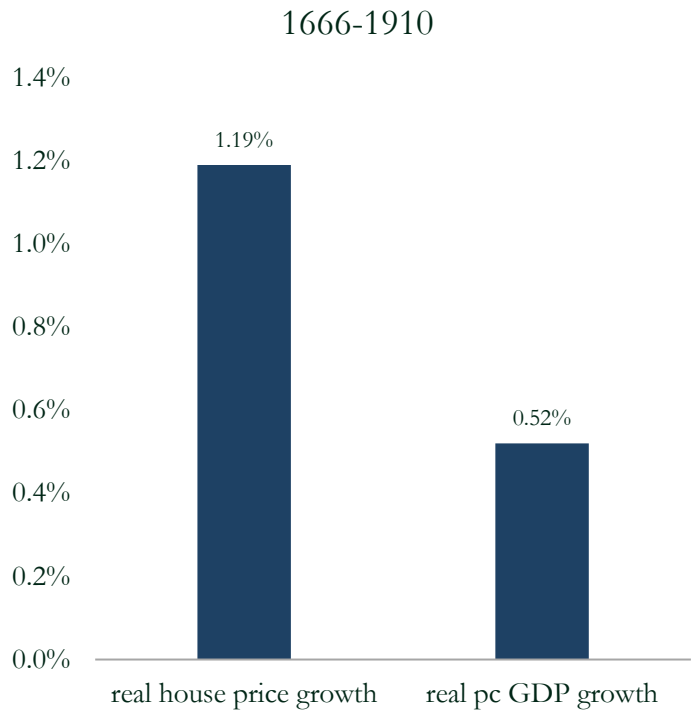
- "Reflections from casual observation ought to convince us that homes have not appreciated significantly over the decades...real home price growth must have been less than real per capita disposable income growth, which was 2.0% a year from 1929 to 2013. The bottom line appears to be that, while there is some uncertainty about the actual path of home prices, most of the evidence points to disappointingly low average rates of real appreciation of most homes...Actually, the theoretical argument that home prices can be expected to appreciate faster than consumer prices in general is not strong."

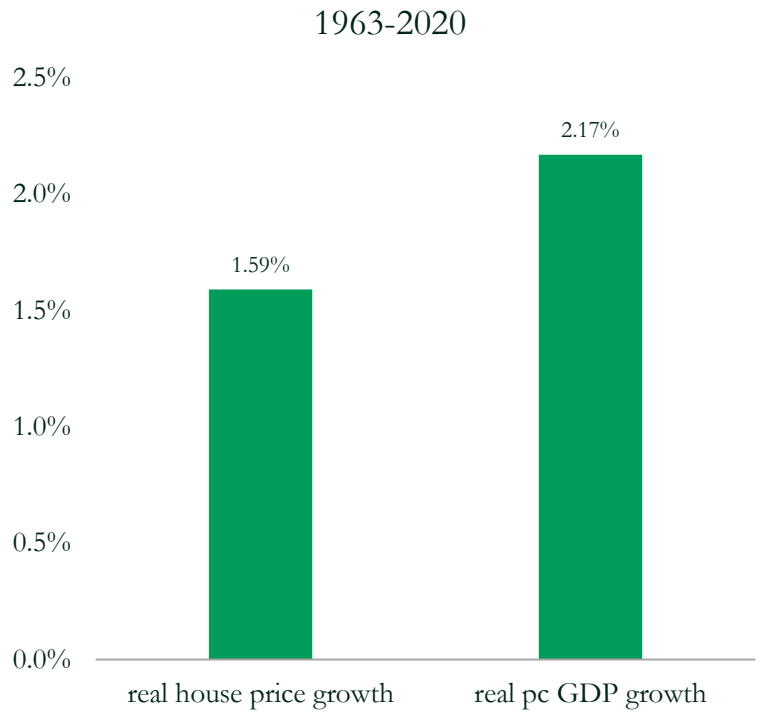


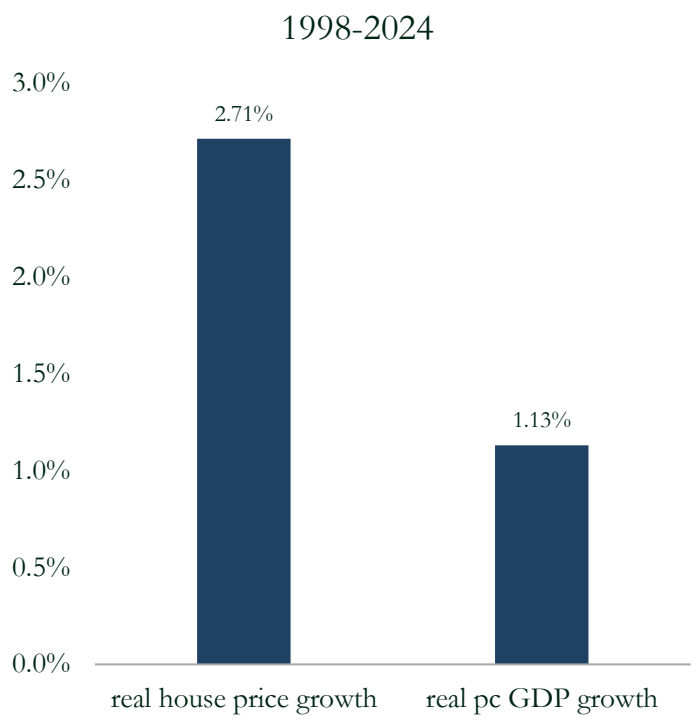
Notes: Figure displays indexed U.S. All-item inflation (CPIAUCSL) and median house sales price, quarterly basis. Retrieved via FRED. 4Q:1997=100.

Does income outpace house price growth?

- Much, in fact, suggests that house price growth > real pc income growth is the long-run norm.
- One narrative emphasizes "bubble conditions" in DM housing since ca. 1998.
- But alternative narrative: 1998 marked return to long-run trend?



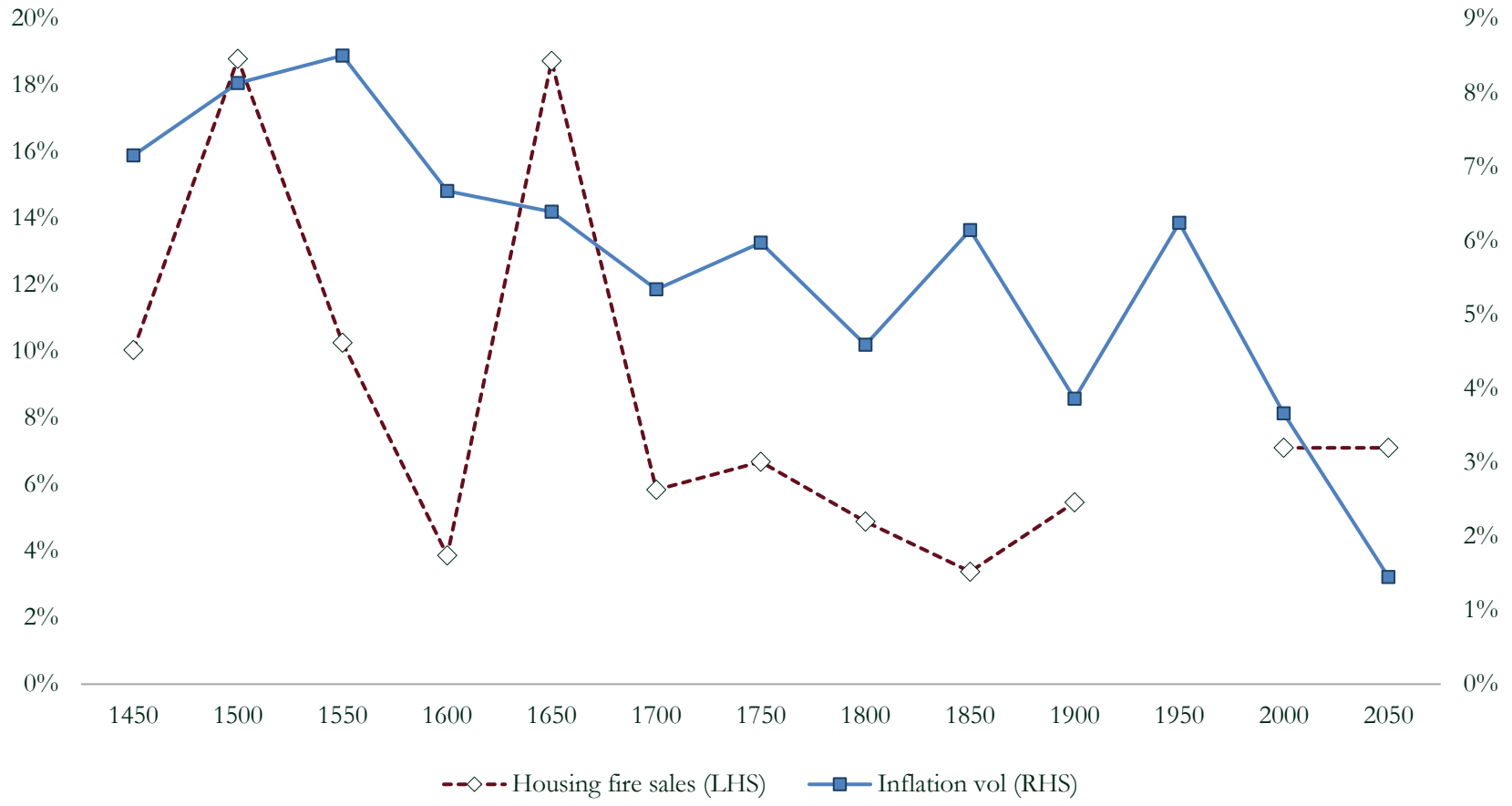




Notes: Figure displays German data for house price growth and real per capita income growth, the latter figure being sourced from Pfister (2022). Periods shown correspond to either formal Bai-Perron breaks in series (1666), or narrative evidence of breaks (1998, per Shiller). Post-1963 German data via JST.

RISKS, PUBLIC AND PRIVATE.

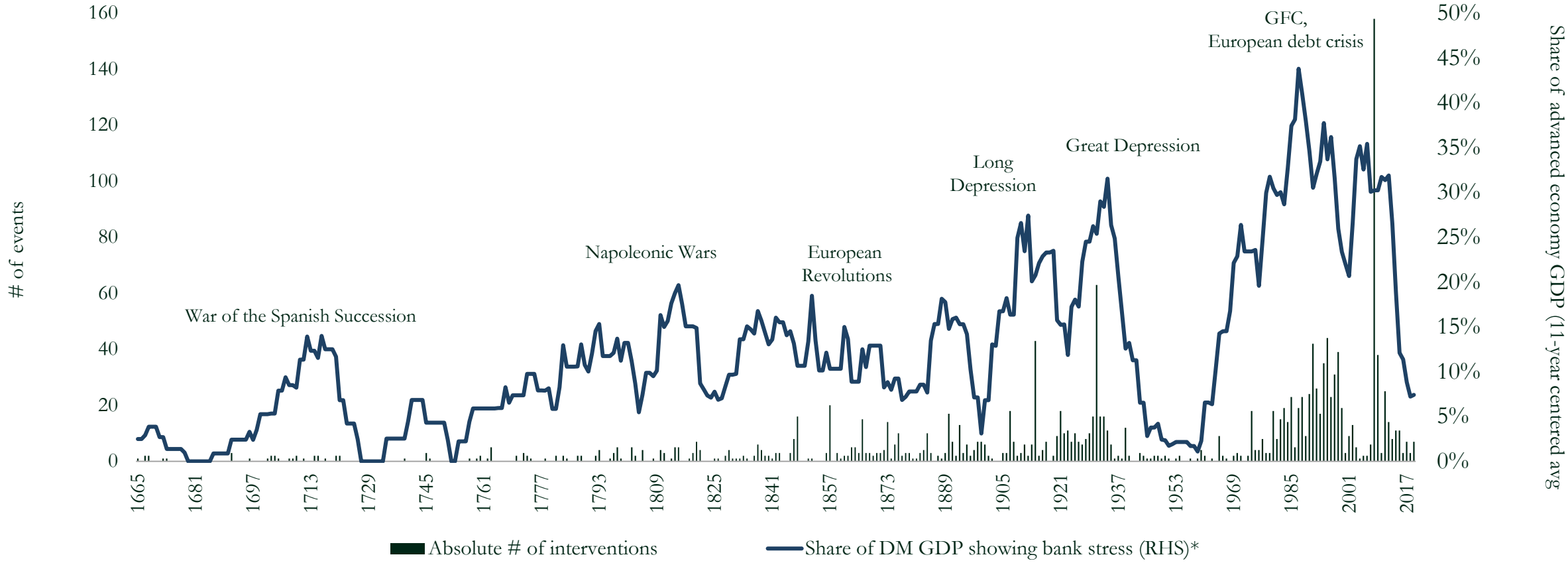
- Sovereign rates break in 1557 (RRSI, AER 2024) – mortgage rates appear to lag.
- Fire sales stable from ca. 1700, while inflation vol keeps declining post-1700. Echoes Zwierlein fire data.
- In general, this should suggest falling PUB-PRI spreads.



Notes: Figure displays semi-centennial averages for the fire sale frequency for German housing (as defined in paper, LHS), and DM inflation volatility, also using 25-year windows before after semi-centennial dates. Inflation data based on eight GDP-weighted advanced economies, non-lagged, as defined and discussed by Rogoff, Rossi, and Schmelzing (2024), and Schmelzing (2025).

RISKS, PUBLIC AND PRIVATE.

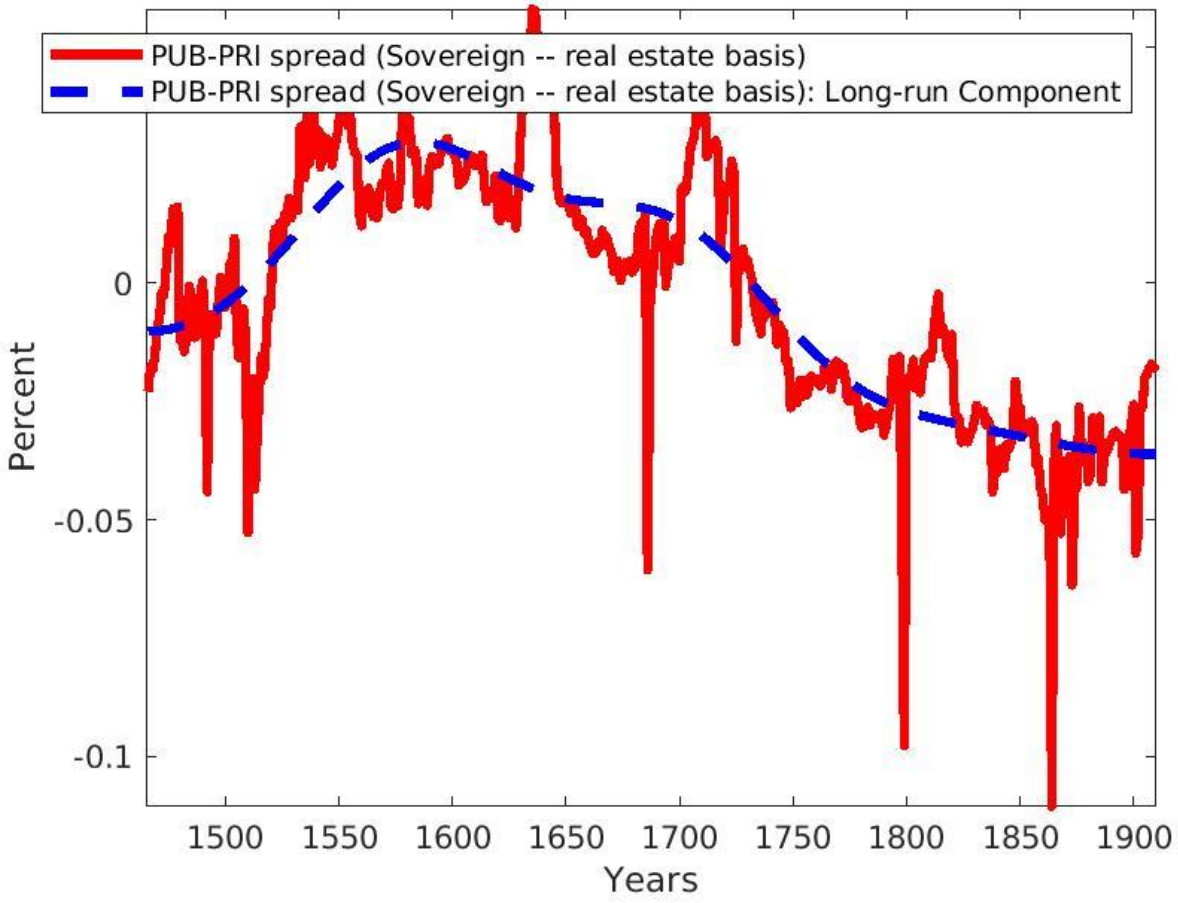
- Sovereign rates break in 1557 (RRSI, AER 2024) – mortgage rates appear to lag.
- Fire sales stable from ca. 1700, while inflation vol keeps declining post-1700. Echoes MS bank distress data – secular rise in distress.
- In general, this should suggest falling PUB-PRI spreads.



Note: Figure is from Metrick and Schmelzing (2024). Bank stress frequency: combining Reinhart/Rogoff (2009), Schularick and Taylor (2012), Laeven and Valencia (2020), Baron/Verner/Xiong (2021), Metrick and Schmelzing (2024) banking crises or bank intervention chronologies, for eight country DM sample. Frequency=(no. of country years with stress event in any database)/(total no. of country years). Includes systemic and non-systemic events. GDP weights based on Schmelzing (2020).

RISKS, PUBLIC AND PRIVATE.

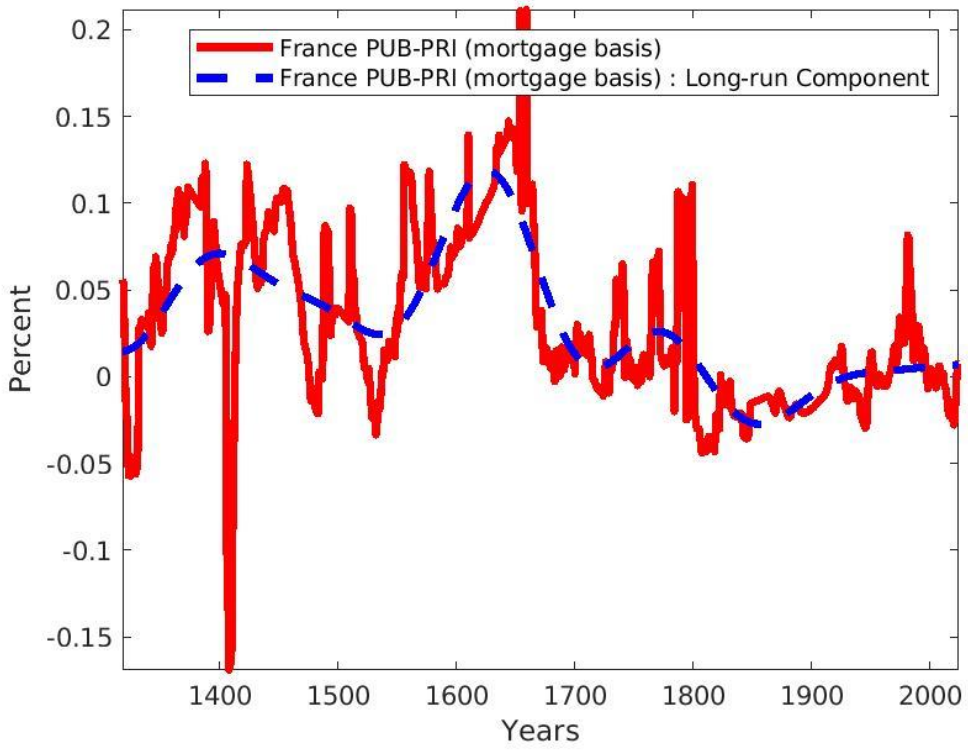
- And indeed, across DMs, there is a long-run decline in public-private long-maturity rates.
- For core DM sample, mortgage rates – long-maturity government can be matched and is most consistent.
- Recent analyses of excess private R – Farhi and Gourio (2020), Reis (2021) – appear tied to longer-run trends, too.

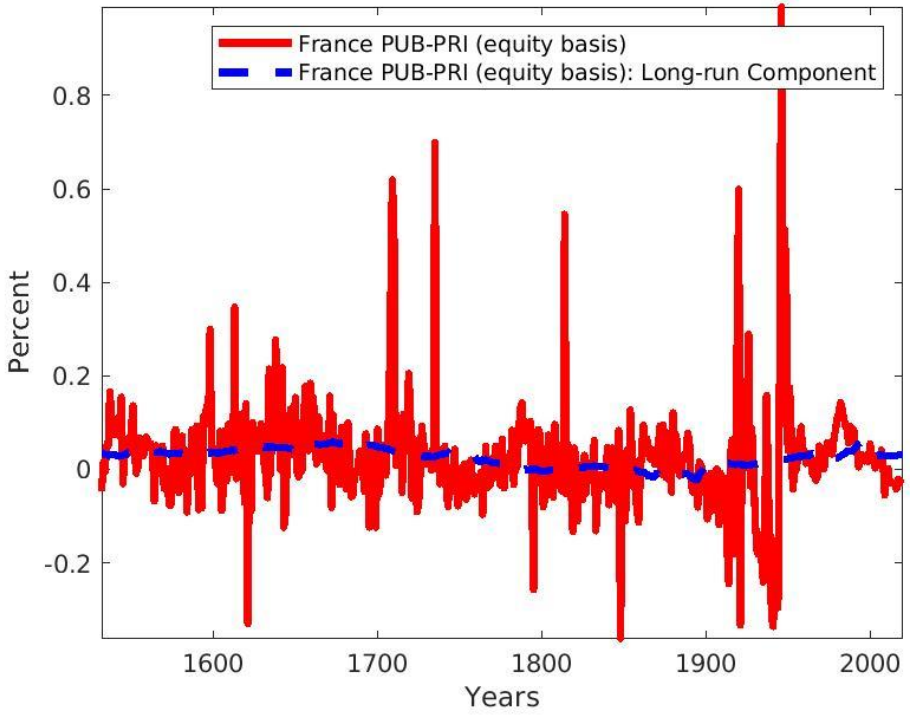


Notes: Figures display spreads between sovereign long-maturity rates and long-maturity mortgage rates, on an annual basis for Germany (left panel, spanning 1318-1847), for details see Schmelzing (2024 and 2025).

AND THAT'S EXACTLY THE PICTURE ACROSS DM…

- PUB-PRI spreads across DMs appear to be on secular decline, with other geographies echoing 1600s inflection.
- French PUB-PRI 1318-1847 inflects 1686. U.S. PUB-PRI downwards trending and deeply below 1800s levels.
- Break begins ca. 1600-1650, and thus before and beyond U.K. 1694 institutional reforms.

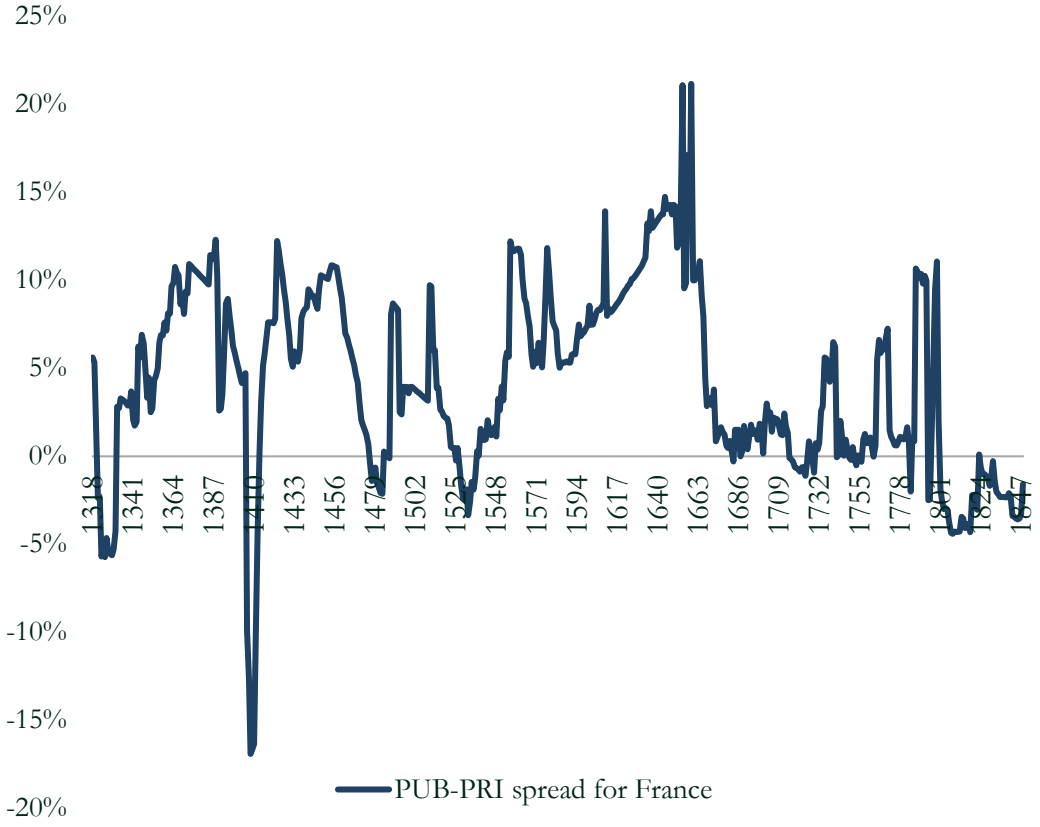


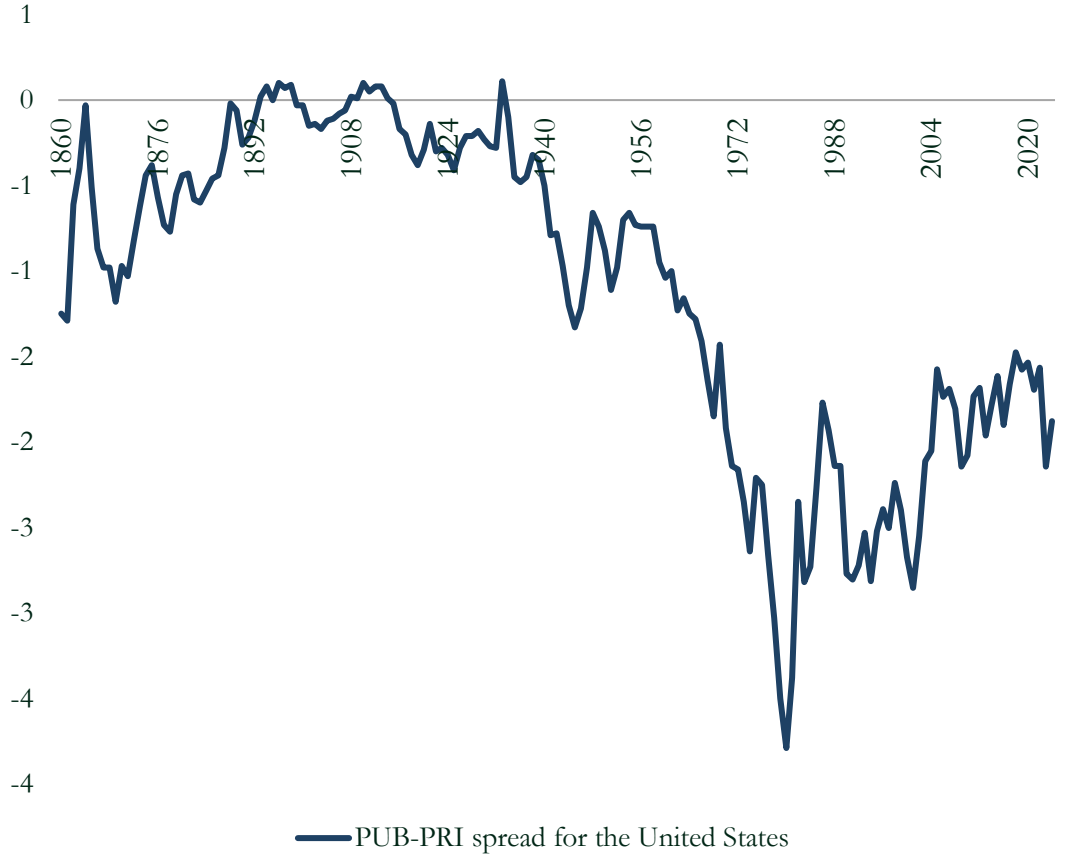


Notes: Figures display spreads between sovereign long-maturity rates and long-maturity mortgage rates, on an annual basis for France (left panel, spanning 1318-1847), and spread between French sovereign rates and equity returns on the LHS, with pre-1946 data based on Bris et al. (2021).

AND THAT'S EXACTLY THE PICTURE ACROSS DM…

- PUB-PRI spreads across DMs appear to be on secular decline, with other geographies echoing 1600s inflection.
- Recent analyses of excess private R – Farhi and Gourio (2020), Reis (2021) – appear tied to longer-run trends, too.





Notes: Figures display spreads between sovereign long-maturity rates and long-maturity mortgage rates, on an annual basis for France (left panel, spanning 1318-1847), and the United States (right panel, spanning 1860-2022). Y-axis in percentage terms, non-smoothed values.

Bottom line(s)

- New high-frequency repeat-sales index for residential housing. Mirroring "best practice" Case-Shiller.

- Qualifies consensus narratives on long-run trends in asset class. No evidence of pre-1970 "stagnation".
- Real house price appreciation is sizable and consistent, at the very least since mid-17th century.
- So is the decline in mortgage rates, based on new data.
- Key structural break in mid-17th century.

- Details new transaction level stylized facts. Secular decline in holding periods, secular increase in typical sales gains.

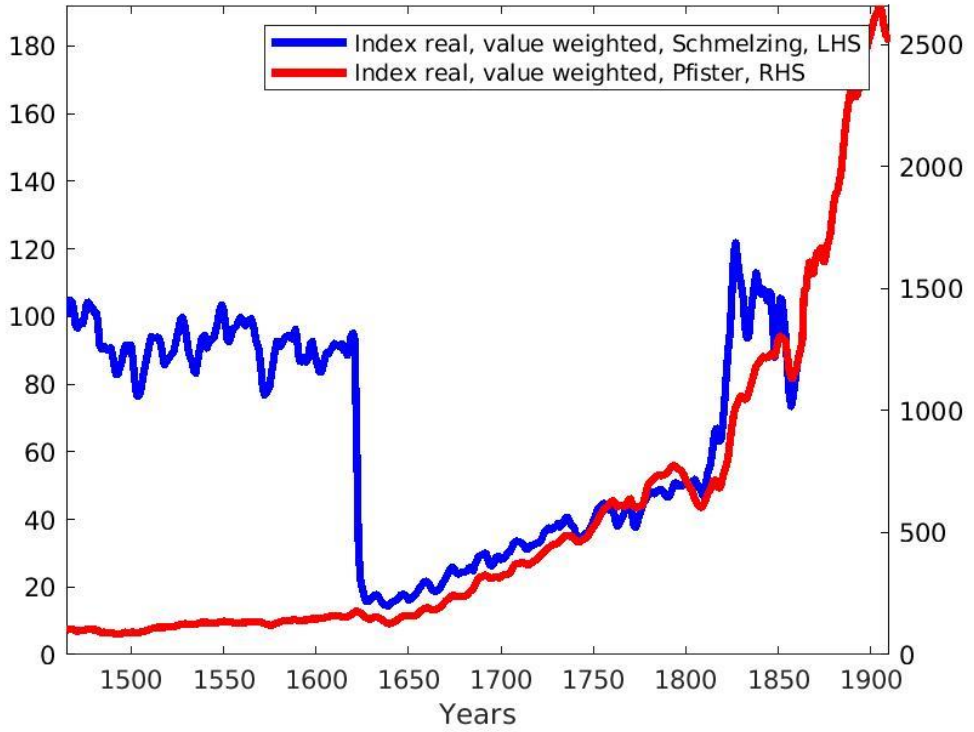
- Does income beat house price growth?
  - Secularly, house price growth stands at ca. 2x output per capita growth (with falling household size).
  - Perhaps 1945-1970 is the outlier rather than the norm. A return to longer run trends since ca. 1998.

- Adds to growing evidence of safe asset inflection over ca. 1550-1650.
- With evidence of constant housing risk, and leading breaks for sovereign rates (1557), the driver is likely the public sector. Multiple indicators, however, of *rising* private sector risks.

SUPPLEMENTARY MATERIAL

A NEW REPEAT-SALES INDEX: GERMANY, 1465-2024.

- Once the serious data deficiencies in existing indices are remedied, secular picture for housing looks very different.
- Little evidence of a "stagnant" market prior to 1970s – in fact housing is booming, across variety of plausible methodologies.
- Even conservative approach suggests house prices tripled in real terms between Westphalian Peace and French Revolution, then rose in by another 3.5x between the Congress of Vienna and World War One alone.



Notes: The plot depicts the new German house price index, in real terms (blue, LHS, using the Pfister 2022 inflation adjustment). This index is shown in context to the Knoll (2017) real house price index for Germany over 1910-2017, in red (RHS, here 1910=100). This is the value-weighted index version, index rebalancing on annual frequency.