Identifying Housing Market Bubbles: Bespoke Bubbles for Diverse Market Structures

Malwina Rzepka, PhD candidate
Kozminski University

Abstract

Objective: This study seeks to examine and compare existing housing market bubble approaches within diverse housing market structures.

Data Sources: Real Housing Price Indices and overpricing metrics (price-to-rent, price-to-income) from OECD and FED Dallas databases. Analyzed period: 1975–2022.

Key Findings:
- **Inconsistencies in Indices:** Widely used real estate indices inadequately represent the complex housing market dynamics of some countries.
- **Limitations of Bubble Detection Methods:** IMF (2009) and GSADF (PSY, 2015) tests yield inconsistent results across different market structures, raising questions about their universal applicability.
- **Indicator Performance Varies by Market:**
  - **Germany & Spain:** Price-to-rent and price-to-income ratios fall short as ownership choices are driven by institutional factors, not rents or incomes.
  - **France:** Price-to-income is more reliable; price-to-rent is overly sensitive, likely due to government interventions.
  - **United Kingdom & United States:** Price-to-rent is more accurate, detecting risks up to 2 years earlier, likely due to short leases and skewed income distribution.

Implications: We highlight the need for tailored bubble detection models that consider institutional and structural specifics within each housing market.

Introduction

- Despite major western economies sharing similar household income levels and a low-interest rate environment during both the 2000-2007 and 2020-2022 periods, the dynamics of their housing price indices have been observably different, highlighting the presence of additional factors shaping distinct market outcomes under similar macroeconomic conditions.
- Most bubble detection methods are universal in nature. These methods tend to be asset-agnostic, which can be controversial for the housing market modeling. Real estate is inherently heterogenous (Glaeser and Nathanson, 2014) and there is evidence of institutional environment, such as regulations regarding rental market or urban planning, amplyfing housing market volatility (Andrews et al., 2011; Kiyotaki et al., 2024).
- The GSADF test (PSY, 2015), widely used bubble detection method, is commonly applied to Real Housing Price Indices or housing overvaluation indicators, like price-to-rent or price-to-income. Nevertheless, it has yielded inconsistent results across different studies, even in cases where the researched period was very similar.
- Another recognized method is IMF (2009). It is a benchmark based approach to identify booms and busts of the housing market specifically. It identifies the overpricing periods by comparing current housing price growth to historical trends.

Divergent Paths: Housing Price Dynamics in Key Economies Despite Similar Macroeconomic Conditions

Real Housing Price Indices, OECD database

Data and Methods

- **Sample:** Five major Western economies — France, Germany, Spain, the United Kingdom, and the United States — each with diverse market structures, regulatory frameworks, and distinct experiences with housing booms (2000-2007 and 2020-2022). Data spans from 1975Q1 to 2022Q4.
- **Data:** Fed Dallas Dataset provides standardized single-family house price indices. It is robust for analysis but may underrepresent markets with predominant multi-family housing. OECD Dataset includes a broader spectrum of dwelling types, introducing variability that challenges cross-country comparisons.
- **Methods:** We evaluate these datasets for how effectively they capture the housing market structure and potential drivers of real estate prices across different countries. To examine bubble risk across varied market conditions, we review prior studies using the GSADF test with price-to-rent and price-to-income indicators, focusing on how institutional factors impact overpricing indicators' reliability. For robustness, we apply the GSADF test to the price-to-income data from both datasets to account for dataset limitations and establish a benchmark against Pavlidis et al. (2016). We apply IMF (2009) method to real housing price indices from both datasets to compare bubble durations and frequencies, revealing the impact of database choice on results.

Results

- Both the GSADF test and the IMF method are oversensitive and prone to false positives. Tailoring these methods to specific market structures improves reliability, as both methods are highly dependent on the data fed to them.
- Two widely used databases (OECD and Fed Dallas) cannot be used interchangeably, as they may not reflect the true state of the housing stock in a given country. For instance, the IMF (2009) method identified fewer busts in countries where single-family housing data poorly reflects the broader housing market.
- The overpricing metric used in GSADF test (price-to-rent or price-to-income) should also be aligned with the market structure. In countries like France, characterized by frequent government interventions, relatively low income inequality, and a balanced renters-to-owners ratio, the price-to-income ratio is more suitable, as the price-to-rent ratio was overly sensitive, likely due to frequent government interventions. Conversely, in countries with skewed income distribution and short lease terms, like the United Kingdom or the United States, the price-to-rent ratio is more accurate and can detect bubbles up to two years earlier.
- In Germany, both overpricing indicators showed consistent oversensitivity, while in Spain both were undersensitive.

Data choice matters: Fed Dallas (single-family housing only) vs. OECD (total)

Break down of dwelling types per country

Legend: Single-family housing, Multi-family housing, Other
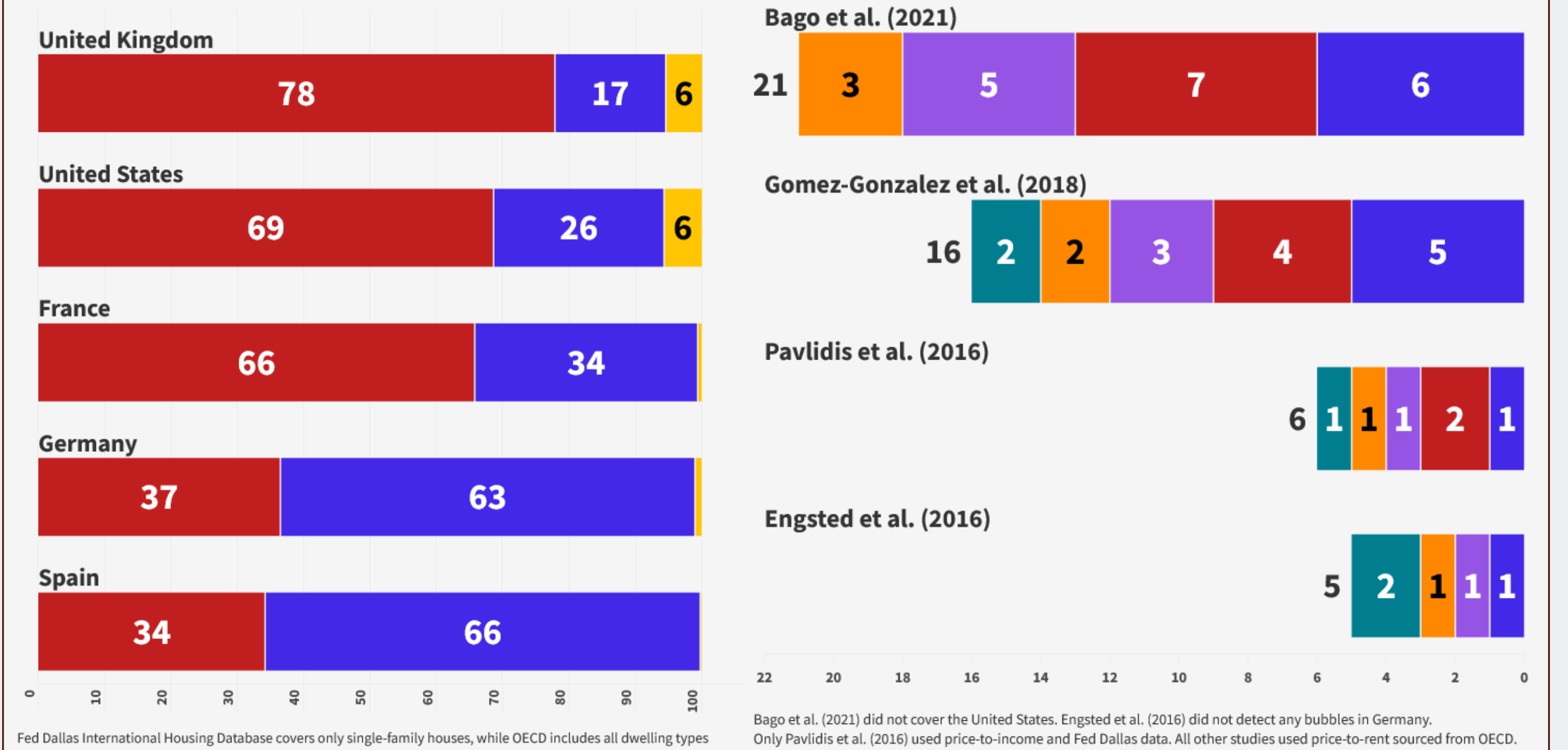
Fed Dallas International Housing Database covers only single-family houses, while OECD includes all dwelling types

Results Across Studies are Inconsistent

Number of Bubbles Identified per Country (using PSY methodology)

Legend: France, Germany, Spain, United Kingdom, United States

Bago et al. (2021) did not cover the United States. Engsted et al. (2016) did not detect any bubbles in Germany. Only Pavlidis et al. (2016) used price-to-income and Fed Dallas data. All other studies used price-to-rent sourced from OECD.

Discussion

- In Germany and Spain, ownership decisions are largely driven by institutional factors—like rental market regulations and subsidies— rather than by traditional fundamentals such as rents or incomes. This suggests that in these markets, the bubble detection should account for these regulatory influences, and therefore many conventional methods may fall short.
- Our analysis shows that the choice of dataset (in the case of both methods) and indicator (in the case of the GSADF test) can successfully address methods' limitations. For instance, applying the GSADF test to indicators that better fit each market's structure—such as using price-to-rent in markets with short lease terms and skewed income distribution, as in United States or United Kingdom – can significantly improve accuracy.
- For the IMF method, establishing separate benchmarks for each country may help mitigate oversensitivity, and lead to more reliable detection results.

Data and Method Choice Shape Results

Variation in Bubble Detection Outcomes by Method and Dataset Choice

Legend: France, Germany, Spain, United Kingdom, United States
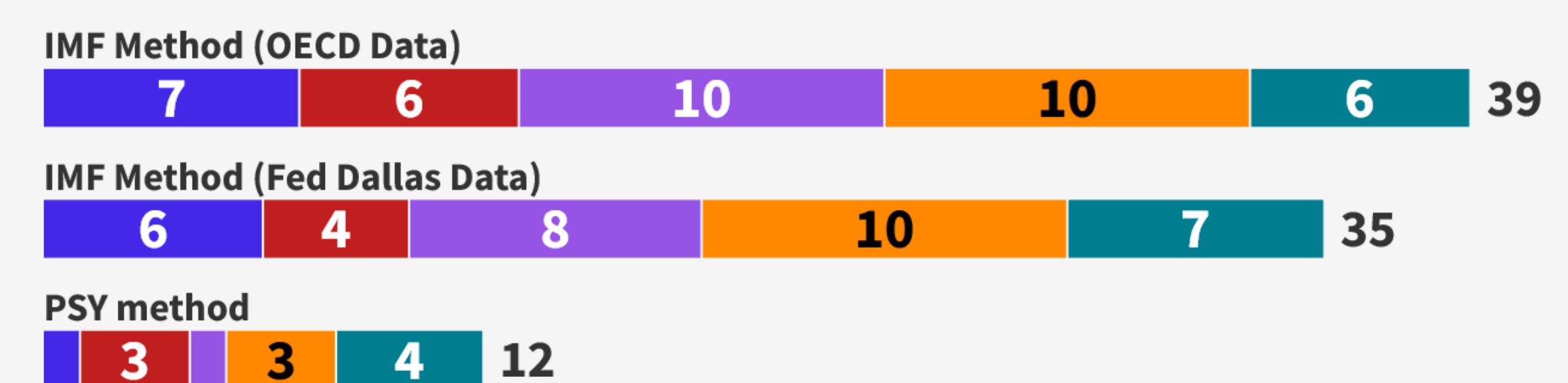
For the PSY method, we used Fed Dallas data and price-to-income ratio as a direct benchmark against Pavlidis et al. (2016). OECD data includes all dwelling types, while Fed Dallas data covers single-family homes only.
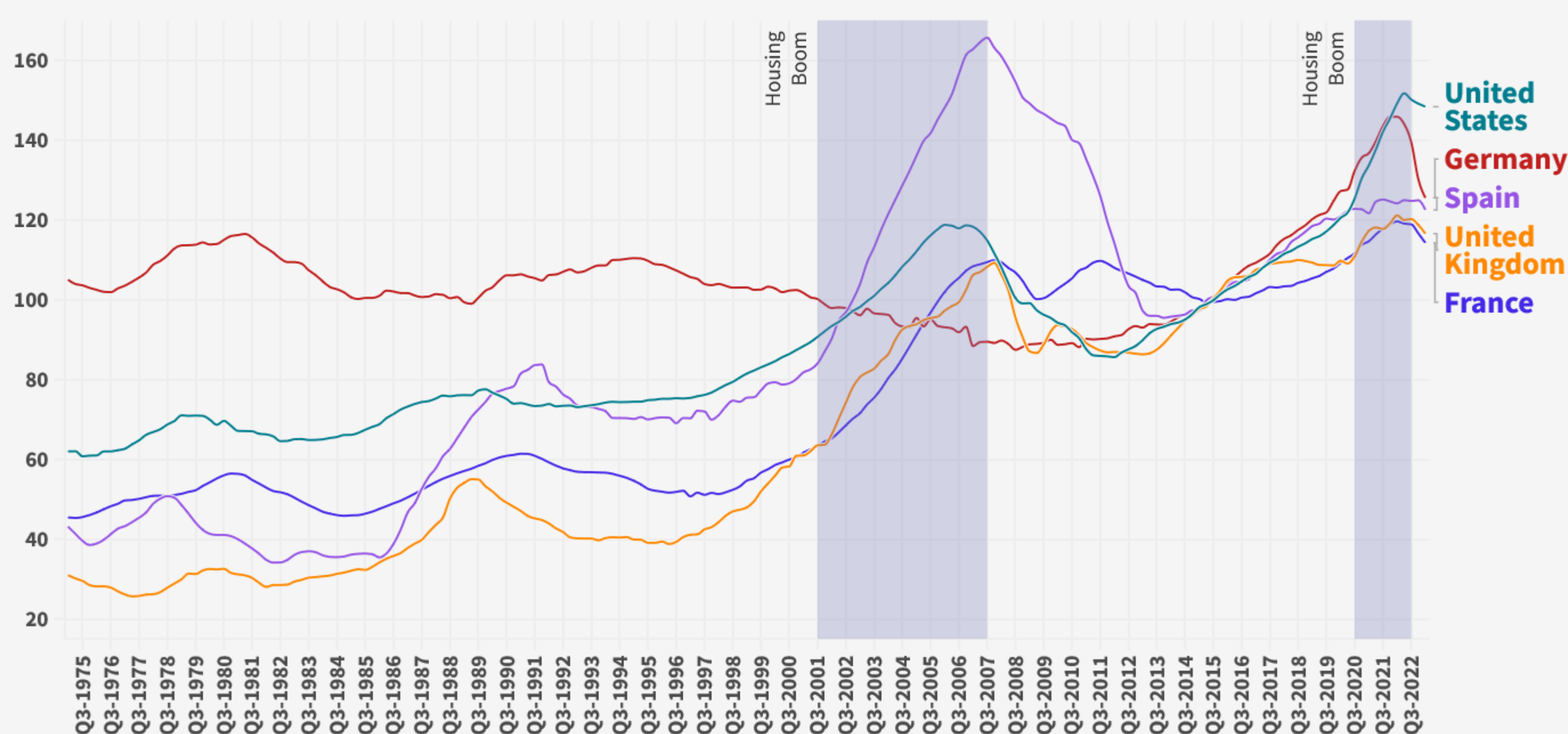
Conclusions

- These findings highlight the need for a bespoke approach to housing market analysis. By considering the unique institutional and structural factors in each market, researchers and policymakers can improve bubble detection accuracy, reducing both the likelihood of false alarms and missed signals.
- Future research should continue to explore the performance of housing overvaluation indicators in diverse market structures and refine bubble detection techniques to better account for institutional factors.
- A tailored approach to boom detection could help design more effective policy interventions to stabilize housing markets and prevent disruptive economic cycles.

Contact

Malwina Rzepka
Kozminski University
Email: mrzepka@kozminski.edu.pl
Website: https://malwinarzepka.github.io/
Phone: +48 798 813 130

References

1. Andrews, D., Sánchez A. C., Johansson A., 2011 Housing Markets And Structural Policies In OECD Countries, OECD Economics Department Working Paper No. 836, ECO/WKP(2011)5
2. Bago, J.-L., Rherrad, I., Akakpo, K., Ouédraogo, E., 2021. Real Estate Bubbles and Contagion: Evidence from Selected European Countries. REA 13.
3. Engsted, T., Hviid, S.J., Pedersen, T.Q., 2016. Explosive bubbles in house prices? Evidence from the OECD countries. Journal of International Financial Markets, Institutions and Money 40
4. Glaeser, E., Nathanson, C., 2014. Housing Bubbles (No. w20426). National Bureau of Economic Research, Cambridge, MA
5. Gomez-Gonzalez, J.E., Gamboa-Arbeláez, J., Hirs-Garzón, J., Pinchao-Rosero, A., 2018. When Bubble Meets Bubble: Contagion in OECD Countries. J Real Estate Finan Econ 56
6. International Monetary Fund 2009. Lessons for monetary policy from asset price fluctuations. World Economic Outlook, n.d.
7. Kiyotaki, N., Michaelides, A., Nikolov, K., 2024. Housing, Distribution, and Welfare. J of Money Credit Banking 56
8. Mack, A., Martinez-Garcia, E., 2011. A Cross-Country Quarterly Database of Real House Prices: A Methodological Note (Revised with V. Grossman: January 2019).
9. OECD National and regional house price indices
10. Pavlidis, E., Yusupova, A., Paya, I., Peel, D., Martinez-García, E., Mack, A., Grossman, V., 2016. Episodes of Exuberance in Housing Markets: In Search of the Smoking Gun. J Real Estate Finan Econ 53
11. Phillips, P.C.B., Shi, S., Yu, J., 2015. TESTING FOR MULTIPLE BUBBLES: HISTORICAL EPISODES OF EXUBERANCE AND COLLAPSE IN THE S&P 500: TESTING FOR MULTIPLE BUBBLES. International Economic Review 56