

Institution: Lancaster University		
Unit of Assessment: 17, Business and Management Studies		
Title of case study: Supporting financial stability analysis and policymaking through the development of analytical tools for monitoring international housing markets		
Period when the underpinning research was undertaken: 2014 - 2020		
Details of staff conducting the underpinning research from the submitting unit:		
Name(s):	Role(s) (e.g. job title):	Period(s) employed by submitting HEI:
Efthymios Pavlidis Ivan Paya	Professor Professor	2008-present 2005-present
Period when the claimed impact occurred: 2014 - 2020		
Is this case study continued from a case study submitted in 2014? N		
<p>1. Summary of the impact</p> <p>The collapse of the real estate bubble between 2007 to 2009 led to one of the longest and deepest recessions in modern history. As a result of research undertaken at Lancaster University Management School (LUMS) into the real estate market, policymakers and the general public are now equipped with comprehensive indicators to monitor risks and financial stability in the UK and international housing markets. The methods and indicators produced by the research team on a regular basis are freely available to the public at two online portals: the International Housing Observatory (IHO), in collaboration with a USA policymaking institution, and the UK Housing Observatory. These tools are used by central banks to enhance decision-making regarding macroprudential policies. They have also become part of the toolkit taught in training programs aimed at practitioners from central banks and regulatory authorities from around the world. In addition, the methods and indicators have been employed on numerous occasions as an internationally recognised benchmark to inform the debate about the impact of house prices on households and on financial stability.</p>		
<p>2. Underpinning research</p> <p>Pavlidis and Paya's research has contributed to the development of methods for analysing asset price deviations from fundamental values that can signal exuberance and potential downside risk in asset markets and economic uncertainty that constitutes a key determinant of macroeconomic fluctuations that can amplify recessions. Although the methods are valid for any asset class, the empirical contribution has focused on the housing market due to its importance in the overall economic system: <i>"A house is the most valuable thing many people will ever own... Mortgages are the greatest source of debt for households in the UK... Mortgage lending is also the main activity for banks, which in itself makes it a risk to the UK banking system,"</i> (Bank of England (BoE)). The research has advanced understanding of the contribution of the housing market to systemic risk, and the dynamics of house prices in the UK and abroad.</p> <p>Asset Prices and Financial Stability</p> <p>The last four decades have been characterised by prolonged build-ups and sharp collapses in asset markets in the industrialised and developing world. Accordingly, policymakers have increasingly addressed the potential role of central banks and prudential regulatory agencies in preventing financial instability (e.g., the creation of the Financial Policy Committee by the BoE). In [R1] and [R2], Pavlidis and Paya (with Peel) developed novel methods for detecting speculative bubbles applicable to any asset price. These methods are attractive because they can be implemented in real time and exclusively rely on high-frequency, readily available financial data. These features allow these methods to be employed as part of early-warning diagnostic tests of great importance for financial stability and policymaking.</p> <p>Housing Markets</p> <p>Boom-bust episodes in housing, similar to that experienced in the 2000s, cause large variations in household wealth and affect homeowner borrowing and spending abilities, which ultimately impacts financial stability and the real economy. Similarly, macroeconomic</p>		

shocks and changes in financial conditions, such as credit tightening and loosening, are an important source of housing market fluctuations. Therefore, understanding the dynamics of property prices and the nature of historical episodes of property price exuberance becomes particularly important. In [R3–R5], Pavlidis and Paya (with Peel and Yusupova) developed and applied state-of-the-art time series methods to detect potential risks arising from housing markets. Using international house price data from the last four decades, the research has established: (i) when the exuberance in domestic housing markets escalated; (ii) whether synchronisation across countries led to global exuberance; and (iii) which factors were the drivers of exuberance.

Following the financial crisis of 2007 to 2008, measuring and explaining systemic risk has attracted much interest. In [R6], LUMS research examined the role of the real estate sector in the determination of systemic risk in the UK. The research quantified for the first time the systemic risk of the housing sector and examined the role of unaffordability in its build-up. The research provided quantitative evidence of the tail dependency (probability of distress) between the real estate and financial sectors. In addition, the research sheds light on the factors driving such relationships that could be leading indicators of systemic risk.

3. References to the research

- [R1] **Pavlidis, E., Paya, I., and Peel, D.** (2017). Testing for speculative bubbles using spot and forward prices. *International Economic Review*, 58, 1191-1226. <https://doi.org/10.1111/iere.12249> (20 citations Google Scholar)
- [R2] **Pavlidis, E., Paya, I., and Peel, D.** (2018). Using Market Expectations to Test for Speculative Bubbles in the Crude Oil Market. *Journal of Money, Credit and Banking*, 50, 833-856. <https://doi.org/10.1111/jmcb.12525> (11 citations Google Scholar)
- [R3] **Pavlidis, E., Yusupova, A., Paya, I., Peel, D., Martinez, E. and Grossman, V.** (2016). Episodes of exuberance in housing markets: in search of the smoking gun. *Journal of Real Estate Finance and Economics*, 53, 419-449. <https://doi.org/10.1007/s11146-015-9531-2> (82 citations Google Scholar, Altmetric score 3)
- [R4] **Pavlidis, E., Martínez-García, E., and Grossman, V.** (2019). Detecting Periods of Exuberance: A Look at the Role of Aggregation with an Application to House Prices. *Economic Modelling*, 80, 87-102. <https://doi.org/10.1016/j.econmod.2018.07.021> (11 citations Google Scholar)
- [R5] **Yusupova, A., Pavlidis, E., Paya, I., and Peel, D.** (2017). *Exuberance in the UK regional housing market*. (Economics Working Paper Series 2017/012). Lancaster University, Department of Economics.
- [R6] **Pavlidis, E., Paya, I. and Skouralis, A.** (2020). House prices, (un)affordability and systemic risk. *New Zealand Economic Papers*, 1-19 <https://doi.org/10.1080/00779954.2020.1718185>

4. Details of the impact

The research described in the previous sections led to a close relationship with the [International House Price Database](#) (IHPD) team of the Federal Reserve Bank of Dallas (FRBD). The FRBD is one of the 12 regional Reserve Banks that, along with the Board of Governors in Washington, D.C., form the USA's system of central banks whose role is to implement monetary policy and to supervise and regulate financial institutions. Pavlidis and Paya's collaboration with the FRBD initiated in 2014 with a joint research project on monitoring international house prices for episodes of exuberance [R3]. Since then, Paya and Pavlidis have been providing the IHPD team with statistics that detect and date periods of housing market exuberance for all the OECD countries. These statistics are constructed following the methods developed in [R3] and [R4] and are updated every quarter. Exuberant or explosive price behaviours may occur when house prices deviate from housing market

fundamentals, so these indicators provide a useful signal of emerging misalignments and are a powerful means of market surveillance.

The engagement with the FRBD further developed with the launch of the [International Housing Observatory](#) (IHO) in spring 2019. Pavlidis and Paya, together with a Senior Researcher from the FRBD, are the founders and co-directors of this collaborative project that provides real-time information of housing markets around the world. Website users can manage and work with the data that is updated regularly, and use the tools available in the portal to customise their own reports and results. Notable users include members of the European Stability Mechanism (ESM), the IMF, the BoE, the Reserve Bank of Australia, the European Central Bank (ECB), and business analysts, CEOs and Executive Directors of corporations [S1]. As part of the collaboration with the FRBD, Paya and Pavlidis also created the R statistical package *exuber* (freely [available from CRAN](#)), which allows users to conduct their own analysis of asset market exuberance. Between 2018 and 2020, the package has been downloaded >14,000 times [S2].

In parallel, Paya and Pavlidis developed a related but independent initiative at LUMS, the '[UK Housing Observatory](#)' which began its activities in the second quarter of 2015. This was the first freely available knowledge-transfer online portal dedicated to the analysis of the UK real estate market. Guided by the underpinning research, the portal provides a series of indicators reflecting the state of the housing market. Apart from UK national and regional house price exuberance indicators, these include a novel house price uncertainty index (HPU) and a new house price index, the Housing Observatory Price Index (HOPI), based on all housing transactions in England since 1995. The LUMS team have made this available at the three levels of statistical territorial aggregation in the UK. Just as for the IHO, all of this information is updated every quarter and, due to the interactive nature of the portal, users can download the data and the results of the analyses for their chosen geographical area. The portal facilitates real time monitoring of domestic real estate markets at the national and regional levels and has been used as an internationally recognised benchmark by policy institutions and the media as documented below.

Impact on policy decision-making

The new tools, indices and indicators produced on a regular basis facilitate the development of better monitoring mechanisms and more effective and proactive policies. The BoE has been looking at these indicators in their risk assessment exercises [S3].

The international reach of the research and collaboration with the IHPD has been particularly relevant for international organisations and central banks that closely monitor developments in housing markets, as attested by the Vice President of the FRBD, *"The partnership with you and your colleagues has helped inform our views about international housing markets and has been a great asset for the Dallas Fed"*. He also stated that, *"Developing and maintaining the database not just for internal policy purposes, but also to better inform policymakers and analysts elsewhere in the United States and around the world. Indeed, the International House Price Database is now one of the most accessed parts of the Federal Reserve Bank of Dallas' website, and seems to be attracting more and more attention"* [S4].

This increasing attention has spread internationally among users such as macro-database analysts and policy-oriented organisations. In reference to the spread of this tool, as illustrated by the breadth of figures at leading financial institutions known to have been informed by the resource, a Senior Research Economist and Advisor of the FRBD and the IHPD indicated in 2018, *"The impact of this resource is being greatly underestimated with these references: CBRE Econometric Advisors, Macrobond database, Quebec Finance Ministry in Canada, International Monetary Fund (IMF), Economic Cycle Research Institute (ECRI), Statistics Canada (STATCAN), Fannie Mae, Central Bank of Chile"* [S1].

Methods developed from the research are becoming part of the toolkit for analysing financial stability, as evidenced by their use in training programmes by the BoE's Centre for Central Banking Studies (CCBS) [S5]. The CCBS runs an extensive programme of events aimed at practitioners from central banks and regulatory authorities from around the world that facilitates the transfer of knowledge and expertise in the area. The methods are also

employed by the South East Asian Central Banks (SEACEN) Research and Training Centre, where participants comprise mainly middle to senior level staff of the 19 SEACEN Regular Member Central Banks/Monetary Authorities. This is corroborated by their Director of Macroeconomic and Monetary Policy Management: “*I continue to use the dataset and the methodology in my lectures and exercises on asset prices and bubbles. On average... about 27-28 participants... from the 19 member central banks/monetary authorities in the region attend our courses*” [S6].

Informing the public debate on the impact of house prices on households and on financial stability

The financial stability indicators generated by the research have been used by mass media as academic and rigorous benchmarks to inform the public and contribute to the debate about potential financial and economic risks originating in the housing market. The UK Housing Observatory was mentioned as one of the specialist bodies warning of a possible ‘housing bubble’ in London by November 2015 (*the Financial Times, Mail Online, Mirror, Evening Standard, This is Money, MSN*) [S7]. [Quoting the Financial Times in November 2015](#), “*Worries about over-exuberance were further stoked when academics from Lancaster University released research arguing that London was on track to be in a house price bubble.*”

The articles coincided with measures adopted by the UK government in the 2015 autumn budget aiming to reduce housing market risks. More recently, the team’s novel HPU index was featured in an *i News* analysis of the effects of Brexit on the housing market [S7].

Further afield, concerns about the sustainability of prices in the housing market and the associated financial implications have been raised by the media in Canada and the USA employing the information developed from the research, i.e., the indicators supplied every quarter to the IHPD to raise awareness of potential risks in their housing markets. A series of Canadian articles published between January 2014 and April 2018 quoted/referred to the methods and indicators to stimulate a discussion about the factors driving house prices and whether prices had detached from fundamentals or not, with its associated financial risks [S7]. Between January 2014 and May 2020, the combined potential readership of the outlets with articles referring to the work is 115,612,656 [S7].

5. Sources to corroborate the impact

[S1] Emails from the Senior Research Economist and Advisor of the FRBD detailing users of the work published at the IHPD and users of the IHO, 2015 and 2018.

[S2] CRAN database statistics, December 2020.

[S3] Information provided by the BoE’s analyst in the Macro-Financial Risk Division, 2017.

[S4] Letters from the Vice-President & Associate Director of Research for International Economics (FRBD), 2018 and 2020.

[S5] Email from CCBS Advisor, 2015.

[S6] Email from the Director of Macroeconomic Monetary Policy Management of the SEACEN Research and Training Centre, 2020.

[S7] List of media citations with readership figures, 2014 – 2020.