



## House prices and bank credits in Malaysia: An aggregate and disaggregate analysis



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### A B S T R A C T

#### JEL classification:

E44  
G21  
R21  
R31

#### Keywords:

House prices  
Aggregate and disaggregate analysis  
Cointegration  
VAR  
Malaysia

The paper investigates the long run behavior of house prices and their dynamic interactions with bank credits, real output and interest rate for the case of Malaysia. Apart from the aggregate house prices, the analysis also covers various house price sub-indices, namely, the terraced house price index, the semi-detached house price index, the detached house price index and the high-rise price index. From the aggregate perspective, we note the presence of a long run relation among the variables. Moreover, the findings suggest the long run causality that runs from the included variables to both the aggregate house prices and bank credits. Dynamic interactions between house prices and bank credits are further reflected by the generated impulse-response functions. The disaggregate analysis indicates that only the terraced house price index forms a long run relation with bank credits, real output and interest rate with their dynamic interactions to mimic well the aggregate systems. Still, a further analysis reveals that shocks to the terraced house price tend to diffuse to other segments of housing markets. Among the housing types, the detached house price is relatively segmented and affected only indirectly through the diffusion/ripple effect. These findings bear important implications for macroeconomic stability, monetary policy and investment decisions.

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### Introduction

The concordance of housing and credit cycles and subsequent economic slumps observed in many countries tend to suggest the reinforcing nature of housing and credit markets and their role in aggregate fluctuations. The issue has captured a great deal of attention especially during the course of the recent subprime crisis. Arguably, the causal linkages between house prices and bank credits can run in both directions. On one hand, the availability of bank credits is likely to increase the demand for housing and accordingly its prices through lower lending rates, expected favorable economic activity and relaxation of liquidity constraints faced by households (Oikarinen, 2009). On the other hand, the increase in house prices can also spur bank lending activities either by stimulating credit supply or credit demand (Goodhart & Hofmann, 2008). As bank loans include housing loans, the increase in house prices improves banks' balance sheet position thereby their willingness to lend. By the same token, a house price burst is likely to expose banks to default risk. Subsequently, banks may curtail their lending. At the same time, with the perceived

increase in lifetime wealth as well as reduction in borrowing constraints by households in the face of rising house prices, the demand for bank credits could increase as well. While this two-way causal nexus between the housing and credit markets is well argued, the strength of their interactions continues to be a subject of empirical inquiries.

The nature of housing market–credit market causal interactions has important implications. To the extent that the housing and credit markets reinforce each other, their behavior should contain information for future financial distress and aggregate downturns. With the benefits of hindsight, some have claimed that the buildup of bank credits and house prices in the leading years to the 1997/1998 Asian crisis is a key contributing factor to the severity of the crisis (Collins & Senhadji, 2002; Inoguchi, 2011). Accordingly, deviations of both house prices and bank credits from their fundamental values should serve as a useful piece of information to policy makers in designing appropriate stabilization policies (Goodhart & Hofmann, 2008). In addition, to the extent that monetary policy can influence bank credits as postulated by the credit view of monetary transmission mechanism, monetary authorities should be cautious of amplified aggregate fluctuations stemming from their policy actions. Knowledge of the housing cycles and their relations to the credit market is also crucial for investors and construction firms. For instance, if the credit market

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is a priori causal to the housing market, an excessive expansion of credits should serve as a forewarning signal that a collapse in the housing value could ensue and hence should be factored in their investment and construction decisions.

Despite these observations, the nature of house price–bank credit relations in the Asian crisis-hit countries has received limited formal treatment especially over recent years. In the context of Malaysia, an important development in the banking sector after the Asian crisis necessitates formal investigation of the credit–property price interactions. Since the Asian crisis, the banking system in Malaysia has undergone a restructuring process through mergers, increasing presence of Islamic and foreign banks and policy initiatives to improve financial soundness. At the same time, Malaysian banks' credit exposure has shifted from businesses to the household sector and is skewed toward the property sector. Bank credit exposure to the broad property sector was slightly over 30% at the end of 1996 but has increased steadily after the crisis to more than 45% by mid-2011. The rising household debts as well as high exposure of banks to the property sector have raised concern over Malaysia's economic and financial vulnerability. In short, the interactions between the credit and housing markets remain central for Malaysia.

In light of these, the present paper attempts an empirical assessment of the relations between house prices and bank credits for the case of Malaysia using quarterly data after the Asian financial crisis. More specifically, it entails three essential objectives. First, it examines whether house prices share a long run relation with bank credits and, if they do, estimates the nature of the long run relations. Second, it evaluates the nature of short-run causal interactions between the house prices and bank credits. And third, by performing the analyses at both the aggregate and disaggregate house price levels, the paper seeks to determine the house market segments that drive and are driven by bank credits. The analyses are conducted in multivariate setting, which includes, in addition to the above focal variables, real output and a measure of interest rate. While the former two objectives are crucial for gauging general housing market conditions and their relations to other variables particularly bank credits, the last objective provides relevance for especially investment purposes. To this end, we apply time series techniques of unit root and cointegration to establish the presence of a long run relation between house prices and their determinants. Then, their causal interactions are evaluated through the notion of Granger causality and generalized impulse-response functions simulated from a VAR modeling.

In the next section, we provide a review of relevant literature. Section 3 details the empirical approach and Section 4 presents data and estimation results. Finally, Section 5 contains a summary of the main findings and some concluding remarks.

## Related literature

Numerous studies have empirically evaluated the relations between house prices and bank credits for various countries.<sup>1</sup> They can be classified roughly according to their objectives with some studies looking at their relations in only one direction while others investigating their causal interactions. These include Hofmann (2003, 2004) and Goodhart and Hofmann (2008) for developed countries, Collyns and Senhadji (2002) for Hong Kong, South Korea, Singapore and Thailand, Gerlach and Peng (2005) for Hong Kong,

Zhu (2006) for six Asian economies, Chen, Tsai, and Chang (2007) for Taiwan, Liang and Cao (2007) and Li and Chand (2013) for China, McQuinn and O'Reilly (2008) for Ireland, Oikarinen (2009) for Finland, Gimeno and Martinez-Carrascal (2010) for Spain, and Inoguchi (2011) for Malaysia, to name a few.

Hofmann (2003) evaluates the causal nexus between bank lending and property prices in 20 developed countries and find evidence for the long run causality from property prices to bank lending. Meanwhile, Hoffman (2004) considers the long run relation between real bank credit, real GDP, real interest rate and real property prices in 16 industrialized countries using quarterly data from 1980 to 1998. He is able to pin down the presence of a long run credit equation for each individual country once the real property prices are incorporated in the analysis. He notes that the real property prices enter positively in the long run credit equations for all countries. Moreover, based on a dynamic analysis, innovations in real property prices solicit positive and persistent responses by bank lending. Goodhart and Hofmann (2008) examine patterns of causality between house prices, money, credit and the macro-economy using a panel vector autoregression of 17 industrialized countries and quarterly data covering 1970Q1–2006Q4. They find multi-dimensional causal links among these variables. For the house prices – bank credit pair, their causal patterns are bi-directional. In addition, the roles of money and credit shocks are found to be stronger during periods of booming house prices.

While the above studies have investigated the property price – bank credit link for groups of countries, McQuinn and O'Reilly (2008), Oikarinen (2009), and Gimeno and Martinez-Carrascal (2010) focus on the experiences of individual developed countries. They all have a primary focus on explaining house prices in respectively Ireland, Finland and Spain. Based on a theoretical model, McQuinn and O'Reilly (2008) posit that house prices tend to depend on how much individuals can borrow from financial institutions, the latter in turns depends on real income and interest rate. They provide supportive evidence based on Irish quarterly data from 1980Q1 to 2005Q4 for a long run positive relation between house prices and the amount individuals can borrow and the significant adjustment of house prices to restore the long run equilibrium relation. Focusing on the Finnish case and using loan-to-GDP ratio as a measure of bank credits, Oikarinen (2009) also identifies a unique long run relation that ties real house prices to real income, loan-to-deposit-ratio and real interest rate over 1975–2006. Household borrowing is noted to affect house prices through the long run relations as well as through the short-run dynamics. Gimeno and Martinez-Carrascal (2010), however, document two cointegrating vectors that link house purchase loans, house prices, labor income and nominal interest rate, one identified as the credit equation and the other the house price equation. The interdependence between house prices and house purchase loans is evident in their studies.

Some studies have also evaluated the issue for several Asian countries. Collyns and Senhadji (2002) empirically examine the contribution of bank lending to property price inflation using quarterly data for a panel of Asian countries – Hong Kong, Korea, Singapore and Thailand. The property price index in these countries is specified to depend on real credit to the private sector and real GDP per capita.<sup>2</sup> Based on panel data analyses, they document strong contributions of both real credit and real GDP per capita to property prices. In addition, the impacts of real credit on property

<sup>1</sup> Empirical studies on house price dynamics are voluminous. Here, we focus only on those studies that have examined the link between house prices and bank credits and recent studies for Asian countries. While existing studies have a predominant focus on developed markets, increasing attention has recently been given to Asian markets.

<sup>2</sup> They initially consider an interest rate variable as a determinant of house prices. However, it is dropped on the basis of being insignificant. This raises a critical statistical issue since, if the interest rate is theoretically a core variable in the determination of the house prices, its omission may result in the omitted variable bias. See also Gimeno and Martinez-Carrascal (2010)

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