Does housing boom lead to credit boom or is it the other way around? The case of China

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ABSTRACT

This study examines the lead–lag relations between the observed correlations of credit and housing price growths during three different sample periods, namely, whole, twin boom, and non-twin boom. We used data from 27 provinces and four municipalities in China. We adopted the panel error correction model to estimate the lead-and-lag relation because the two variables are panel-cointegrated. While we find that bi-directional lead-and-lag relation exists in both markets, the leading effect of housing prices on credit appears to be stronger than the effect of credit on property prices.

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1. Introduction

Recent years have seen strong rates of credit growth accompanied by increases in housing prices in many industrialized countries. Acharya and Richardson (2010) argued that the fundamental causes of the current crisis are the credit boom and the housing bubble. Many attribute the credit and housing bubble as the cause of the crisis and often ponder upon two questions. First, does the observed coincidence between housing prices and credit growth simply reflect the effects of a third factor of a common driving force (e.g., monetary policy or the economic cycle)? Second, does it reflect a direct link between the two variables?

Most studies have focused on the first issue, that is, the observed coincidence between the two markets is caused by a third factor, such as the easy monetary policy. Glaeser, Gottlieb, and Gyourko (2010) examined whether the low real interest rates induce easy credit and further stimulate housing price boom, and reported that lower real rates can explain only one-fifth of the rise in prices from 1996 to 2006. Xu and Chen (2012) found that the level or growth of money supply pushes up the housing price in China (Guo & Huang, 2010; Li, 2013). McDonald and Stokes (2013) reported that the interest rate policy of the Federal Reserve from 2001 to 2004, which pushed down the federal funds rate and kept it artificially low, could be a main cause of the housing price bubble. Favilukis, Kohn, Ludvigson, and Van Nieuwerburgh (2012) argued that financial market liberalization proxied by capital inflows would lower interest rates and support the mortgage boom over this period, although this would only have a small effect on housing prices.

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Although the second issue is crucial, it is seldom investigated. Two opposite directions of the lead–lag relations are often discussed in the literature. The first causality is that credit leads the housing price. Theoretically, more credit supply definitely pushes the housing price up, given that credit growth has fueled economic rise, which would then be one of the drivers to push up property price. Easily available credit, perhaps caused by a global savings glut, leads to low real interest rates that substantially boost housing demand and prices (e.g., Himmelberg, Mayer, & Sinai, 2005; Mayer and Sinai, 2005; Taylor, 2009). The second causality suggests that housing price growth leads to credit growth. Using high-valued property as collateral would increase credit capacity, which in turn, deepens credit boom. The initial housing price growth may be stimulated by owned money and foreign funds. Previous studies commonly use macroeconomic data to investigate this issue. For example, Karapetyan (2011) found the bi-directional causality between the two markets using macro data of housing credit and housing price. Bakker et al. (2012) used graphs to demonstrate the positive link between national aggregate housing prices and credit growth (Anundsen & Jansen, 2011; Goodhart & Hofmann, 2008). The current study used Chinese provincial and municipality data to examine the same issue. Our data is in panel form, and is different from studies using aggregate macro economic data. Knowing the interaction between the two markets is important to predict whether there is a possibility that a joint influence or a sequential effect exists.

Furthermore, a recent argument emphasizes that the "boom periods," such as credit and housing booms, are the critical factors in inducing the crisis. A boom denotes periods where volumes or prices—either their growth rate or deviation from the trend—exceed certain critical values and become abnormally high. For example, Bakker et al. (2012) defined the credit boom with credit-to-GDP ratio growth rate above 10%, whereas Mendoza and Terrones (2012) defined the boom by comparing the credit-to-GDP ratio with its nonlinear trend.

In Section 3, we discuss the process of identifying the boom periods because there are various definitions of boom periods. A credit boom would induce housing boom because sudden large amounts of funds are injected into the already-heated housing market. Conversely, a housing boom would intensify bank lending because of profit or cool down bank loans resulting from conservatism. The twin booms, namely, credit and housing, may also occur simultaneously. Authorities are seriously concerned with the existence of twin booms because joint occurrence may end in market collapse and financial crisis. However, during the non-twin boom periods, such as single boom, also deserves special attention due to the possible damage that may be inflicted on both the financial and real estate sectors.

Despite the existence of several studies on how the credit or housing market affects financial stability during the boom periods,[1] the interaction between the markets during their boom and non-boom periods is rarely investigated.

In the current work, we use 1999–2012 data from 27 and four Chinese provinces and municipalities, respectively, to investigate two issues. First, we investigate whether credit and housing booms occurred in our sample. Next, we examine the lead-and-lag relation between the two markets during three different sample periods, namely, whole, booming, and non-booming. We then measure the activities of the two markets using two variables, namely, credit-to-GDP ratio (Credit) and housing price (House).

We apply the panel error correction model (PECM) to examine the lead-and-lag relation between the two markets. Considering that the estimated results cannot reject that both variables are non-stationary by using panel unit root testing statistics, we further examine whether the two variables are cointegrated. A cointegrated relationship suggests the use of an error correction model (Engle & Grange, 1987) and further indicates PECM for panel data. Our results show that the housing growth leads to credit growth during twin and non-twin booms periods. However, the bi-directional causality is found by using the whole sample. Thus, to a greater extent, the housing market starts the engine, possibly from using the own money or foreign capital inflow, followed by the credit market, after which they jointly affect each other. For example, during 2007, the housing boom entailed the formation of the housing bubble, which collapsed during the 2008 Financial Crisis. Then, the huge amount of credit expansion followed to save the market. For this single episode, housing growth led to credit growth. Goodhart and Hofmann (2008) find a two-way link between house prices and money, especially in the housing boom phenomena that occurred in 17 industrialized countries from 1973 to 2006. However, they do not consider the link during either boom period. It is also possible that, based on theory of optimal portfolio adjustment mechanisms, increases in asset prices induce agents to adjust their spending, further increasing the demand and supply of credit (Goodhart & Hofmann, 2008; Meltzer, 1995; Nelson, 2003; Setzer & Greiber, 2007).

Finally, our study examines the "lead-lag relation" between credit and housing markets. Our reduced model does not discuss the structural interaction between the two variables. While it is plausible that the "true relation" is caused by the missing third variable, this is not the aim of this study.[2]

This paper is organized into seven sections. Section 1 presents the introduction. Section 2 reviews the literature, including a review of studies on credit and housing booms. Section 3 discusses the definitions of credit and housing booms. Section 4 illustrates the econometric modeling, including panel unit root, panel cointegration tests, panel Granger causality using whole sample, and panel Granger causality during booms. Section 5 describes the data used in this paper. Section 6 shows the empirical results, including

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[1] See Bakker et al. (2012) for studies on credit boom and Baker (2008) for studies on housing boom. See also Section 3 for the discussion of credit and housing booms.

[2] Generally, there are three different types of modeling in which a Granger-causality test can be applied (see Foresti, 2007); these are the (1) bivariate case, i.e., in a simple Granger-causality test, there are two variables and their lags; (2) multivariate case, i.e., in a multivariate Granger-causality test, more than two variables are included because it is assumed that more than one variable can influence the results; and finally, (3) VAR case, i.e., Granger-causality can also be tested in a VAR framework (in this case, the multivariate model is extended to test for the simultaneity of all included variables).
The bivariate case stresses the condition that "A Granger causes B" (A leads to B) and the second and third conditions stress that "A causes B." Thus, the so-called "missing third variable" problem occurs only in the latter two conditions, because they are concerned with the economic effect of A on B. In the first one, A leads to B even though A does not cause B.