



Real estate collateral value and investment: The case of China



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ABSTRACT

Previous research on the United States and Japan finds economically large impacts of changing real estate collateral value on firm investment that amplified the business cycles of those countries. Working with unique data on land values in 35 major Chinese markets and a panel of firms outside the real estate industry, we estimate investment equations that yield no evidence of a collateral channel effect. Further analysis indicates that China's debt is not characterized by the frictions that give rise to collateral channel effects elsewhere. Essentially, financially constrained borrowers appear able credibly to commit to repay debt in China. While there is no impact on investment via the collateral channel, our results should not be interpreted as implying there will be no negative fallout from a potential real estate bust on the Chinese economy. There likely would be, but through different channels.

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1. Introduction

In the absence of complete contracting, economists realized that pledging collateral such as owned real estate can allow firms to borrow more, and thus, to invest more (Barro, 1976; Stiglitz and Weiss, 1981; Hart and Moore, 1994). Macroeconomists recognized the implication this had for amplifying the business cycle via a collateral channel effect (Bernanke and Gertler, 1989; Kiyotaki and Moore, 1997). Falling asset values reduce the debt capacity of credit constrained firms, which depresses their investment on the downside of the cycle. An analogous impact occurs on the upside of the cycle when collateral values are increasing for these firms.

Research on the United States and Japan supports this theory and has shown that rises and declines in property values substantially amplify the volatility of investment by non-real estate firms (Chaney et al., 2012; Cvijanovic, 2014; Gan, 2007a, 2007b; Liu et al., 2013). For example, Chaney et al. (2012) report that a one standard deviation increase in underlying real estate collateral

value is associated with over one-quarter of a standard deviation higher level of corporate investment. This implies about six cents added investment for every dollar increase in collateral value. Earlier research by Bernanke (1983) concludes that this factor helps account for the extraordinarily large variation in output during America's Great Depression.

The remarkable boom and recent cresting of China's housing and land markets raise the question of whether the amplitude of its economic cycle has been magnified by a collateral channel effect on investment. China is an increasingly important factor in the global economy, so the answer to this question is important. Two new data sources are combined to provide the first estimate of the impact of changing real estate collateral values on the investment behavior of Chinese firms outside the real estate sector. One is a constant quality land price series in 35 major Chinese cities; the other measures real estate collateral value for publicly-traded firms outside the property sector in China.

In stark contrast to the recent findings referenced above for America and Japan, we find no evidence of a collateral channel effect among non-real estate firms' borrowing and investment behavior in China. This conclusion is robust to a wide range of permutations. For example, there is no evidence of asymmetry in the collateral channel effect depending upon whether housing and

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land markets are rising or falling. We also do not see heterogeneity in impact by measures of likely financial constraint. For example, there is no difference in our baseline results depending upon whether the firm is a low versus high dividend payer. Nor is there any meaningful effect (or difference in impact) depending upon whether or not the firm is a state-owned enterprise (SOE). We can also rule out the possibility that our results might be driven by financially constrained firms tending to be located in markets without good investment opportunities (so that they rationally would not want to invest even if collateral value increased substantially to lessen the degree to which they are constrained). Actual growth rates of local GDP were high in absolute terms among the slowest growing of our 35 markets during our sample period, so it seems likely that there are profitable investment opportunities in those places. And, there is no evidence of a positive collateral channel effect among firms headquartered in the markets with the strongest growth trends.

While these are noteworthy findings in their own right, we also show that the analysis provides insight into the nature of China's financial markets more broadly. A well-known theoretical literature tells us that collateral channel effects would not be expected if no firms were credit constrained or if there was 'contract completeness' in the financial markets (Barro, 1976; Stiglitz and Weiss, 1981; Hart and Moore, 1994). There is reason to believe that an important type of company in China, the state-owned enterprise (SOE), is not financially constrained because of its special access to government-controlled bank funding (Allen et al., 2005; Ayyagari et al., 2010). Thus, SOEs have no need to rely on collateral value to fund their investment programs. In contrast, private firms (which we call non-SOEs) are highly likely to be constrained. In an environment with incomplete contracting so that credible commitments to repay debt could not be made, we would expect pledging collateral to ease financial constraints and make investment more plentiful (on the upside of a cycle).

That we find no evidence of a collateral channel effect for either group of firms raises the question of whether Chinese capital markets are fundamentally different in the sense that private firms can credibly commit to repay. Further empirical analysis of variation in collateral channel effects among financially-constrained non-SOEs supports this hypothesis. For example, we look at how estimated impacts differ by whether the local lending market is dominated by the four biggest lenders, each of which is itself a state-owned commercial bank.¹ The underlying hypothesis is that non-SOE firms can credibly commit to repay their lenders because the costs of defaulting on what is effectively an arm of the government in a state dominated by a single party are prohibitively high. Concomitantly, a given borrower is less able to credibly commit to repay if the lender is not one of the dominant SOE banks. We find evidence of collateral channel effects for private firms the lower the share of the 'big four' SOE lenders in the borrower's home market. A similar pattern is found in additional analysis using a variable that measures the transparency of the local market's business law environment. The stronger a city's underlying legal system's protections against unilateral government sanctions against non-party actors, the more we see a collateral channel effect among non-SOE borrowers.

In sum, financially constrained firms do exist in China among the group of non-state-owned enterprises. However, there is no evidence of 'contract incompleteness' in markets dominated by the big four SOE lenders or in markets with weaker legal systems that do not protect entities from government whim. In these cases,

the frictions that give rise to collateral channel effects in other countries are absent in China, which is consistent with the claims of Allen et al. (2005). We would not expect meaningful collateral channel effects to occur unless, and until, China develops a more effective and independent legal system that can protect defaulting borrowers from unilateral sanctions by powerful state-supported creditors.

Before getting to that analysis, the next section describes the unique real estate and firm data we bring to bear in our estimation of the collateral channel effect. Section 3 then discusses our estimation strategy and reports initial results. Section 4 delves more deeply into the nature of Chinese financial markets with its analysis of non-SOEs. There is a brief conclusion.

2. Data on land values and listed firms

We bring two new data sources to bear on the question of whether there is a collateral channel effect on Chinese firm investment. Both are unique to the study of the Chinese economy. The first is a panel on land prices across 35 Chinese cities; the second is a panel on firms not directly involved in the real estate industry.

2.1. Land value data

Our land price series is based on sales of raw land by local governments, and is described more fully in Deng et al. (2012). While raw land sales are rarely observed in most countries, this is not the case in China. Local governments own all the urban land in the country and allow private parties to purchase use rights of up to 70 years for residential purposes (i.e., technically, this is a leasehold estate).² We treat the upfront lump sum payment as the transactions price for raw land because there are no further rental payments required.

Our data series begins in 2003 because of an important 2002 ruling by the Ministry of Land and Resources that required local governments to sell land via public auction and to publicly report the winning bidder along with the transactions price. This marks an important break with past practice that has been criticized as open to corruption (Cai et al., 2013), which muddies the interpretation of price data before this change. We also typically observe the land parcel's precise address, designated usage, land conditions upon delivery, and certain planning indicators such as the floor-to-area ratio.

Building upon prior research on the city of Beijing in Wu et al. (2012), we worked with a leading residential real estate data vendor in China (Soufun) to collect information on all residential usage land sales to private parties from 2003 to 2011 in the 35 major markets mapped in Fig. 1. The geographic breadth of our sample is noteworthy. We are not limited to a few coastal-region markets that the media typically report to have the biggest booms. Table 1 reports summary statistics on the sample. We have complete data dated since 2003 for 15 markets, with the rest entering the sample in subsequent years. The number of transactions per market ranges from 25 to 50 depending upon the year.

Land parcels in China are priced in terms of the floor area of housing permitted to be built on the parcel, instead of in terms of the land area. For each parcel, its real price in constant 2009

¹ These firms are Industrial and Commercial Bank of China (ICBC), China Construction Bank (CCB), Agricultural Bank of China (ABC) and Bank of China (BOC). Together, they accounted for just over 42% of the bank loan market in China in 2012. See Deng et al. (in press) for more institutional detail about these four dominant state-owned banks.

² Not only does Chinese law facilitate the use of such leasehold estates in urban areas as collateral for borrowing, but the data confirm that they can and will be transferred to the lender if the borrower defaults. For example, 14 of the 16 commercial banks listed on the Shanghai or Shenzhen exchanges regularly report the value and breakdown of repossessed assets seized because of defaulted loans. At the end of 2011, the total book value of their repossessed assets was 10.79 billion yuan RMB, of which the leasehold estates associated with properties accounted for 8.79 billion yuan RMB (or 81.4%). The remainder was comprised of plant and equipment, securities, etc.

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