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Financial development and asset valuation: The special case of real estate

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ABSTRACT

This paper studies the impact of financial development on asset valuation. We model the agency theoretic perspective of risk-averse investors and financiers in a general equilibrium setting under the framework of rational expectations (i.e., symmetric information). We focus on real estate, as it constitutes a special case of complete market contracting where adverse selection and moral hazard are easily mitigated. Our results illustrate an increase in pareto-efficiency, as financial architecture advances from: (i) banks to capital markets; and (ii) plain vanilla debt to an innovative one with participation clauses. This is attributed to the reduction in agency costs and cross-sectional risk-sharing, leading to an increase in the value of property. Our results predict that an optimal financial system will orient itself towards efficient financial contracts, irrespective of its source of origination. We also rationalize the co-existence of banks and capital markets, and generalize our results under a set of restrictive conditions.

1. Introduction

> *"Mortgage market development is likely to be a key factor in overall financial market development. In particular, an efficient mortgage market will act as a positive externality for the other capital markets, creating pressure for higher efficiency in these markets. On the other hand, a poorly functioning mortgage market is likely to 'pollute' other financial markets with its inefficiency."*
> (Jaffee and Renaud, 1998, p. 75)

The ongoing US sub-prime mortgage crisis and the Asian financial crisis of a decade ago illustrate how *fragile* financial systems devastate a country's (or a region's) real estate sector and thus its economy.[1] These two crises originated from contrasting financial systems, i.e. a market-based and a bank-based respectively.[2] Nonetheless, these crises bring to focus the vital linkage between the financial system of a country and the value of its assets, especially its real estate (see Glaeser, 2000). These crises reignite the debate on the design of *efficient* financial intermediation to mitigate the vulnerability of the macroeconomy to risk.[3, 4]

This paper aims to explain efficient financial intermediation in the context of the evolution of the financial system, and factors that shape its architecture. Debates on financial system development were initiated by Gerschenkron (1962), who inferred empirically that banks' prominence in economic development stems from economic backwardness. In recent years, there has been increasing momentum towards a capital market based system,

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[1] Sub-prime home loans basically imply loans to borrowers who have sketchy credit history and are financially strapped or lack adequate income to qualify for a standard mortgage. They are thus lower in quality than prime loans.

[2] Historically the two different styles of financial intermediation have evolved in response to financial crises. These include a centralized or a "bank-based" financial system in Continental European countries (and Japan) versus a decentralized and "market-based" system in Anglo-Saxon countries such as the United States and United Kingdom (see Allen and Gale, 2000; Levine, 2002).

[3] The financial intermediation system connects asset prices with the macroeconomy (see Glaeser, 2000). It is therefore imperative to design an efficient financial system to mitigate the vulnerability of the economy to risk (see Blejer, 2006). This is because: (i) regional home bubbles have a negative impact on residential investment and thus aggregate output (see Higgins and Osler, 1998); (ii) a sharp fall in house prices leads to a reduction in consumption through the *wealth* effect (see Case et al., 2005); (iii) a significant decline in real estate prices leads to foreclosures and losses for lenders, thus straining the banking system (see Case, 2000); and (iv) endogenous developments in the credit markets are amplified and transmitted to the macroeconomy through the *financial accelerator* effect (see Bernanke et al., 1999).

[4] The International Monetary Fund estimates the total losses and write-downs to be around $2.2 trillion (see Wolf, 2009). The costs of earlier real estate crises in Indonesia, Thailand, Japan, and the United States are estimated to be roughly 65%, 45%, 20% and 3% of the GDP, respectively (see Renaud, 2003; Hoshi and Kashyap, 2004).

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especially in the emerging economies of Latin America and Eastern Europe (see Allen and Gale, 2000). However, it is still unclear as to how financial systems in these countries will evolve and how it will impact their welfare. As Levine (1997, pp. 702–703) points out, "*We do not have adequate theories of why different financial structures emerge or why financial structures change. We need models that elucidate the conditions, if any, under which different financial structures are better at mitigating agency costs.*" This is precisely the focus of our paper.

It is almost an article of faith that the primary reason for the existence of banks is the mitigation of the twin issues of *information asymmetry* and *moral hazard*.[5] This paper, however, presents a special case of complete market contracting that does *not* require the financier to have any information-processing or monitoring advantage.[6] Financing of real estate constitutes an exceptional situation for two reasons. First, real estate lenders (the principals in a debt contract) can decipher any proprietary (ex-ante) information held by borrowers (the agents in a debt contract) by trading financial claims over a multi-period horizon. This is deduced from the literature on multi-period insurance contracting (see Hosios and Peters, 1989). In the "real world", lenders also have access to information on ex-post risk and return on various classes of properties to help them underwrite their facilities appropriately. Adverse selection, stemming from ex-ante information asymmetry, is reduced further by releasing funds in the escrow process, when the title of the specific property is exchanged for cash. Second, real estate lenders also reduce moral hazard, stemming from ex-post change in borrower behavior, by mandating the following in the mortgage covenant: (i) minimum maintenance on the property; (ii) payment of taxes; and (iii) adequate insurance coverage.

We identify *financial liberalization*, *financial deepening, risk management and financial innovation* as the key transmission channels of financial system development, as financing advances from (i) banks to capital markets, and (ii) plain vanilla debt to innovative ones such as participating debt. Therefore, increased capital market sophistication and the presence of non-bank financiers in capital markets diminish bank lending (see Fig. 1).

Abiad et al. (2008) refer to *financial liberalization* as a reduction in the role of government and an increase in the role of the market in allocating credit. In the empirical literature, the indicators often used for this are credit controls; interest rate controls; entry barriers for banks; regulations; and restrictions on international financial transactions. The Financial Liberalization Hypothesis, propounded by McKinnon (1973) and Shaw (1973), argues that the choice of investments made by banks is affected by government restrictions and therefore impacts on the whole economy. In contrast, a liberalized financial system, with no restrictions on direct ownership of assets, leads to market-determined interest rates resulting in efficient allocation of capital (credit). This implies that a liberalized financial system is in a better position to promote economic growth and development than a repressed one (see Ranciere et al., 2006). In other words, financial liberalization *enhances* social welfare.

We narrow our focus to the government regulation of banks. It is a well known fact that banks in the United States are restricted from taking equity positions in properties (see Allen and Gale, 2000). According to Stulz (2000), allowing banks to hold equity positions in assets has pros as well as cons. A bank that takes an equity position in an asset (along with debt) cares more about overall asset value than one that does not. However, this exposes banks to *systemic risks*. In other words, it makes them more vulnerable to financial crisis that could devastate the entire economy. We initially consider the case of a partially liberalized commercial bank, which has no restrictions on its loan to value (LTV) ratio, but is prevented from holding equity positions in firms. We then extend our study to the case of universal banks and non-bank financiers, such as pension funds and insurance companies.

Abiad et al. (2008) refer to *financial deepening* as the increase in the volume of credit being intermediated in financial markets. Many studies use the terms 'financial development' and 'financial deepening' interchangeably without distinguishing between the two. However, we consider financial development as much broader in scope encapsulating financial liberalisation, financial deepening, risk management, and financial innovation. We call these the *four pillars* of financial development, as they impact on the efficiency of the financial system. In a liberalized financial system, financial deepening occurs with an increase in funds, allowing a greater volume of investment to take place through capital markets. Economies that have financially deep markets have high capital market liquidity, which increases the intrinsic value of assets traded in it (see Levine and Zervos, 1998).

According to Allen and Gale (1997), a well-developed financial system has a comparative advantage in providing *cross-sectional* risk-sharing, i.e., diversification of risk at a given point in time. This is due to the presence of financiers who are not constrained from taking equity position in firms (dispersed ownership).[7] The Allen and Gale (1997) theory thus predicts that as a financial system moves towards the developed stage, *risk management* will gain greater significance through use of options, futures, and other derivatives. Hence *financial innovation* plays a very important role in the risk management process (strategy and tactics) of organizations. The theory is thus consistent with the fact that risk management techniques are more important in economies with developed financial systems than in rudimentary financial systems (see Levine, 2002).

Pareto-optimal contracting through the use of risk management as well as financial innovations helps improve the *efficiency* of a financial system by reducing *endogenous* agency costs of debt (see Merton, 1995). When firms are debt financed, manager-entrepreneurs have an incentive to transfer downside risk (of the project) to the financiers while benefiting from the upside potential. This is a well-known problem of *risk-shifting* or *asset substitution*. A number of studies, such as Smith and Warner (1979) and Barclay and Smith (1995), have illustrated that risk management through the use of secured debt alleviates this issue.[8] Other studies, such as Haugen and Senbet (1981) and Green (1984), have argued that participating/convertible debt and other forms of innovations also mitigate this issue by allowing the financiers to share in any windfall that the manager-entrepreneur receives.

[5] This insight originated in Leland and Pyle (1977). Further elaborations were made by Diamond (1984) and Boot and Thakor (1997).

[6] Our study precludes incomplete markets, as contracts that are clearly and unambiguously written create securities that span each state of the economy. This is attributed not only to the unambiguous language of contracting, but also to the presence of a strong institutional infrastructure, which strictly enforces property rights and provides judicial interpretations in any possible gaps in contracting. See Smith and Warner (1979) for details on debt contracting using covenants.

[7] Banks may ease the *intertemporal smoothing* of risks that cannot be diversified at a given point in time. In capital markets, on the other hand, intertemporal smoothing is ruled out by competition (see Allen and Gale, 1997, 2000).

[8] The literature on the use of secured debt (mitigating risk shifting) depicts mixed results. On one hand, studies such as Smith and Warner (1979) and Barclay and Smith (1995) strongly support it; while on the other hand Titman and Wessels (1988) find no evidence for it. The reasons for this discrepancy are attributed to three factors. First, secured debt is contingent on the quality of the asset being financed (see Shleifer and Vishny, 1992). Second, standards of underwriting debt (especially mortgages) are not scientific. They are based on ad hoc credit rationing techniques (using initial LTV and income ratios – see Jaffee and Stiglitz, 1990). Finally, these ad hoc underwriting criteria are not applied uniformly over the economic cycle (see Stanton, 1998). This is because credit is generously granted in the expansionary phase of the economic cycle and severely constrained in the contractionary phase, thereby leading to a "credit crunch".