Dissonance between Formal and Informal Housing Capital

The Case of Korea

BY

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THESIS

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This thesis is dedicated to my wife, Inhee Kim.
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<td>ADF</td>
<td>Augmented Dickey-Fuller</td>
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SUMMARY

This dissertation research develops a new way to analyze the evolving dynamics of wealth concentration in the Global South, where indigenous norms and institutions play a crucial role in accumulating wealth. The research particularly posits the Chonsei system as non-institutional, unregulated and informal housing capital that is invaluable for building wealth in Korea. By shedding new light on such peculiarity, this research develops a model that better explains growing inequality in that country and ties it to structural changes resulting from greater financial globalization.

The research develops this approach through three separate research programs that together analyze the emerging dissonance between formal and informal housing capital in recent decades. These research programs clearly situate the evolving dynamics of wealth concentration by applying agent-based research approaches such as a microfoundational framework and a model of portfolio choice within conceptual frameworks based upon historical and structural contexts in Korea.

The first research program examines the development of the Korean housing finance system. Its unique development path can be characterized as the history of challenges, which refer to forces that have hindered the accumulation of wealth, and responses, which refer to counteractions that seek alternative modes of wealth accumulation. This overarching characterization consequently allows the following research programs to situate inequalities in wealth that are set in motion through the chronic tension between formal and informal housing capital.
SUMMARY (continued)

The second research program examines why and how there has been the radical debt shift from corporate to consumer holdings in Korea over the past decade. Within strict Loan-to-Value (LTV) limits, banks are willing to approve mortgage loans unless borrowers fail to secure a down payment since lenders have a larger cushion against losses in cases of default. At the same time, despite the strict regulatory environment, unregulated housing credit such as Chonsei typically allows borrowers to relax their down payment requirements. As a result, even strict LTV prudential limits will have limited power to control the increasing debt dependency of households as long as the unregulated credit can easily be accessed. I test this proposition through an empirical analysis of the Korean housing finance system using a panel instrumental variables regression approach. The empirical results indicate that over the past decade there has been the explosive growth in residential mortgage lending despite the strict macroprudential limits, as banks can transfer their business risks that would normally be hedged in the financial market onto the space market where the Chonsei system operates.

The third research program examines how such radical debt shift has constructed barriers for household wealth accumulation. This study particularly focuses on investigating the degree to which households’ vulnerability to risk and uncertainty can be differentiated according to the capital structure of their real estate ownership. Unlike the Chonsei system, which requires infrequent debt payments, institutional mortgages require periodic debt payments, which compel households that leverage mortgages to be exposed to risk and uncertainty more often. That is, risk and uncertainty are less likely to be realized while households leverage the Chonsei
SUMMARY (continued)

deposit rather than institutional debts. This study employs a multinomial logit regression approach on the basis of annual panel data drawn from the Korean Labor and Income Panel Study (KLIPS). The empirical results indicate households whose debt structure only consists of the *Chonsei* deposit have higher probabilities of maintaining their real estate ownership despite the impact of risk and uncertainty.

The findings of my dissertation research explicitly contradict contemporary theories of financial intermediation, which stem from axiomatic and pre-social premises of neoclassical economic thought. Instead, on the basis of historical circumstances and structural distinctions in the Korean housing finance system, my research explicates the evolving dynamics of wealth concentration in Korea, as it has transitioned toward financial globalization.
1. INTRODUCTION

1.1 Background

This dissertation research develops a new way to analyze growing wealth inequality in the Global South. This research interest grew directly out my professional experience in banking, finance, and real estate in the immediate aftermath of the Global Financial Crisis of 2008, where I saw up-close how the vagaries of global capital flow produced wide-ranging effects on space and asset markets, businesses, and people's everyday lives.

I accordingly have focused on the significant wave of financial globalization in recent decades, which has taken the form of supra-national policy frameworks that promote increased transnational mobility of capital. This new doctrine restructures the legislative, institutional, and regulatory frameworks of financial market in order to increase cross-border capital flows. This global financial order creates economic agents who draw unequal benefits from the market system, as the financial market restructuring eventually reorients the attitudes of a constellation of agents in the market. Inevitably, wealth inequality has consistently worsened under this global financial order.
I then narrow the focus on developing a model that better explains the distinct paths that emerging economies have followed as they have transitioned toward the global financial regime. In order to scrutinize the distinct nature of wealth inequality in those economies, I particularly shed new light on a *de facto* regime of accumulation that is firmly embedded in a specific socioeconomic circumstance. Within these settings, this study provides a novel lens into the evolving mechanics of wealth concentration in Korea in recent decades.
1.2 **Research Problem and Need**

In the wake of the 2008 Global Financial Crisis, there is a growing concern with how inequalities in wealth are set in motion through housing markets and, relatedly, the integration of housing finance into circuits of global finance (Downs, 2009; Piketty, 2014). A new strand of post-Keynesian banking literature particularly addresses this matter by emphasizing the expanding role of banks as active contributors to the formation of market choices (Dymski, 2005). These studies argue that strategic shifts in retail banking have resulted in financial exclusion, whereby consumers are increasingly sorted and differentiated based on their financial capacity. They have contributed significantly to explaining growing inequality in the Global North, where individuals and households rely on formal credit to accumulate wealth.

This banking-centered framework, however, inadequately describes the nature of wealth concentration in emerging economies, where their own indigenous norms and institutions play a crucial role in accumulating wealth. I argue that models of wealth inequality that draw from vocabulary developed in the Global North need to adapt to historical circumstances and structural distinctions in countries of the Global South in order to illuminate the true nature of wealth inequality.
It is important to note that, due to their focus on financial instruments and institutions, previous models of wealth inequality particularly disregard an indigenous mode of wealth accumulation in emerging economies. That is, even though they seek to reflect entrenched peculiarities that lead to the distinct operation of the global financial regime, their fallacious “single market framework” distorts the true nature of wealth inequality in those economies.

For instance, some previous studies place too much emphasis on socio-economic exclusion in the formal financial sector. These studies typically consider such peculiarities as subsets and elements, or even as residuals and by-products, of the financial market (see e.g. Amaeshi, 2006; Conroy, 2005; Kapur, 1992; Knight; 1998). As a result, this formal market-centered framework incompetently illuminates wealth inequality in emerging economies, as it misspecifies and/or overlooks the informal system that is a critical part of the mode of production and consumption (Roy, 2005).

Numerous attempts then alter this formal market-centered framework to address financial exclusion in the Global South in a more extended manner. These studies postulate the inherent dynamic of informal financial sector, which does not rely on that of formal financial sector (see
e.g. Aryeetey and Udny, 1997; Ghate, 1992; Levenson and Besley, 1996; Okurut et al., 2005; Steel et al., 1997). This premise allows scholars to examine the mechanics of financial exclusion on the basis of the tension between formal and informal financial sectors as well as the inherent dynamic of each financial sector. This extended framework, however, is also within financial market per se, and hence it is still inadequate to investigate the dynamics between de jure and de facto regimes of accumulation that are intertwined with the whole economy.

To sum up, to investigate the peculiar mechanics of wealth concentration, it is crucial to shed light on political, cultural and social legacy that are embedded in a certain economy since such peculiarities are able to create the distinct paths that emerging economies have followed as they have been integrated with financial globalization (Boyer, 2000; Smart and Lee, 2003). In particular, scholars need to regard indigenous peculiarities as key elements and dimensions of the whole economic system, rather than as subsets or outgrowths of formal and informal financial sectors. By doing so, scholars are able to address the evolving nature of wealth concentration in the era of financial globalization in a comprehensive manner.
1.3 **Research Significance**

This study posits that the *Chonsei* system – an indigenous practice of property lease agreement – is a distinct mode of regulation in the Republic of Korea (hereafter called Korea). My premise is that *Chonsei* refers not only to a type of property lease agreement, but also to non-institutional, unregulated and informal housing capital that is invaluable to individual households in order to accumulate wealth.

This overarching conceptualization of *Chonsei* provides a novel lens into the evolving mechanics of wealth concentration in Korea since it has transitioned toward a financial-led growth regime. First, this study refutes previous models of wealth inequality that draw from axiomatic and pre-social premises of contemporary theories of financial intermediation. Rather, by illuminating the structural distinction that is embedded in the Korean space market, this study explicates its unequivocal role on wealth accumulation. Second, this study focuses primarily on the emerging tension between formality and informality in the whole economic system. As this study eschews the common fallacies of a single market framework, it better explains growing inequality in that country and ties it to structural changes resulting from greater financial globalization.
It is worth noting that the notions of a regime of accumulation and a mode of regulation draw from regulation theory, which respectively refer to a system of production, consumption, distribution, and exchange in a certain economy and a set of institutions that provide the context for the operation of a regime of accumulation (Aglietta, 2000). This study, however, focuses more on the accumulation of wealth – the output of a system – through its accompanying modes of regulation. That is, a de facto regime of accumulation refers to the accumulation of wealth that relies on inherent, informal modes of regulation – such as the Chonsei system. On the other hand, a de jure regime of accumulation refers to the accumulation of wealth that depends on extrinsic, universal modes of regulation – such as a property-based mode of regulation in a finance-led growth regime. By redefining these notions, this study postulates the coexistence of de jure and de facto regimes of accumulation in a certain economy – particularly, in the Global South.

The dissertation research develops this approach through three separate research programs that together analyze the emerging tension between formal and informal housing finance systems in Korea. These research programs clearly situate the evolving dynamics of wealth concentration by applying agent-based research approaches such as a microfoundational framework and a
model of portfolio choice within conceptual frameworks based upon historical and structural contexts in Korea.
1.4 **Cited Literature**


2. THEORETICAL AND CONCEPTUAL FRAMEWORKS

2.1 Introduction

This study melds two theoretical foundations – cultural political economy of financial globalization and post-Keynesian perspectives on banking and finance – in order to situate the evolving nature of wealth inequality in emerging economies. A cultural political economy approach allows scholars to adapt to political, cultural and social legacy that create the distinct paths that emerging economies have followed while they have been integrated with the new financial regime. By doing so, this multidisciplinary approach rectifies fallacious models of wealth inequality that draw from axiomatic and pre-social premises of neoclassical economic thought. At the same time, by characterizing atomistic interactions between agents, a post-Keynesian banking model complements the historical and structural perspectives on wealth inequality that typically lack subtle mechanics of financial intermediation and wealth accumulation.

On the basis of these theoretical foundations, this study develops a conceptual model that situates the evolving dynamics of wealth concentration by employing agent-based research approaches within historical and structural contexts in Korea.
2.2 Cultural Political Economy Perspectives on Financial Globalization

Even though capital and property markets have always been inter-connected, they are increasingly being integrated in the era of financial globalization. Why and how has the integration of capital and property markets been accelerated under this financial regime? How have market efficiency and social welfare been changed under the emerging integration of capital and property markets? By answering these questions, we are able to portray the structural and historical circumstances of how wealth inequality has worsened under this global financial order, although it seems to have improved market efficiency.

Financial globalization represents evolving supra-national policy frameworks that promote increased transnational mobility of capital (Harvey, 2005; Peet and Hartwick, 1999; Sassen, 2000). Historically, this doctrine appeared in reaction to the Keynesian failures such as the collapse of the Bretton Woods system and the Energy Crises of 1970s (Downs, 1985; Harvey, 2005). This policy agenda accordingly hypothesizes the inherent efficiency of the financial market. Its strong belief in market fundamentalism theoretically relies on a random walk process of price formation. As long as asset price formation follows the concept of a random walk, in which asset price changes follow an unpredictable path, the market will stabilize since
no one is eventually able to earn excess investment profits and there will be no incentive for speculation (Fama, 1970; Malpezzi and Wachter, 2005). Hence, the increased mobility of capital, which accelerates the price adjustment process, has become an emblem of market efficiency under the new global financial order.

On the basis of this efficient market hypothesis, the new doctrine has promoted the integration of capital and property markets in order to pursue the free mobility of capital (Coakley, 1994). Orthodox economists believe the integration will significantly improve market and social efficiency in manifold ways. First, the integration allows more competitive coordination, which in turn will lead to increasing consumer surpluses (Abel et al., 1989; Makowski and Ostroy, 2001). Second, the integration whittles away the arbitraging opportunities by abolishing spatial and temporal barriers between markets, and hence will stabilize the markets (Bardhan et al., 2008). Third, market completion accompanied by the integration will make products and services more affordable and accessible to consumers (see e.g. Chinloy and MacDonald, 2005). Fourth, the integration will increase fundamental valuation efficiency of property market, as innovative financial instruments evaluate risks associated with real properties more precisely. As a result, the market integration will eventually alleviate the inherent imperfection of property
market – for instance, inelastic supply and illiquidity, which exercises a domino or contagion
effect on capital market (see e.g. Bostic et al., 2007; Brueckner et al., 2012; Glaeser et al., 2008;
Wheaton, 1999).

Contrary to the expectations of these orthodox perspectives, severe financial crises have
persisted while the integration of markets has deepened. Furthermore, economic and social
inequality apparently seems to have worsened in recurring crises. The responses of orthodox
economists to these undesirable consequences, however, are more of the same: the reduction or
elimination of the residuals of asymmetric information and market imperfection (see e.g. Green,
2013; Mayer et al., 2009).

Alternatively, Marxist geographers theorize the circulation of capital within a basic contradiction
between capital – abstract, nomadic, and standardized – and real estate – concrete, immobile,
and idiosyncratic (Gotham, 2009; Harvey, 2006). This Marxist philosophy particularly
characterizes fictitious capital – a flow of money capital not backed by any commodity
transaction – as the decisive source of the intrinsic market instability (Harvey, 2006). As the
credit system that operates with a form of fictitious capital promotes the geographical recycling
of surpluses and deficits, the extensive market integration produces recurring financial crises (French et al., 2009; Gotham, 2009). The developing crises eventually reconstruct people's everyday lives, as the credit system widely seeks intersections that transfer its inherent instability to individuals (Aalbers, 2007; Ashton, 2011; Ranney, 1993).

Meanwhile, regulationist explanations situate the integration of capital and property markets through historical change of regime. As Fordist regimes in the Global North and their Taylorist and Keynesian modes of regulation had rapidly lost the capacity to boost the economies in the 1970s, post-Fordist regimes and their accompanying mode of regulation hypothesize that wealth-based income compensates for the diminished demand based on wages (Boyer, 2000; Smart and Lee, 2003). In this finance-led growth regime, necessarily, capital and property markets are increasingly being integrated to expand wealth-based income opportunities. An accumulation of sufficient stocks of property becomes a prerequisite for creating wealth-based income, and hence inherited wealth gap among individuals has consistently exacerbated wealth inequality under these new global financial regimes (Froud et al., 2000; Lazonick and O'sullivan, 2000).
To sum up, these heterodox schools of thought have refuted the theoretical foundation of financial globalization that geographic expansion and market completion will increase social welfare and market efficiency. Rather, they suggest this financial doctrine will lead to unequal allocations of benefits from the market system and create the junctions that transfer market instability to individuals. Due to their emphasis on structural and macro determinants, however, they typically lack deliberate models that situate the evolving dynamics of wealth concentration derived from atomistic interactions between agents. In order to elucidate such subtle mechanics, this study shifts the focus of attention toward a post-Keynesian banking model that synthesizes a microfoundational framework and premises that are “historically informed, institutionally nuanced and structurally determined” (Dymski, 1998, p. 260).
2.3 Post-Keynesian Perspectives on Banking and Finance

As depicted above, there has commonly been a drastic reform that leads to financial liberalization and integration in many economies, as they are integrated with the new global financial order. Then, how do those macro-structural shifts eventually come down to a matter of wealth accumulation of individual households?

In order to address this matter, a new strand of post-Keynesian banking literature mainly examines the expanding role of banks as active contributors to the formation of market choices. This school of thought particularly focuses on strategic shifts in retail banking that have resulted in financial exclusion, whereby consumers are increasingly sorted and differentiated based on their financial capacity.

I revisit a dual-function bank model of Dymski (1988) in order to scrutinize strategic shifts in banking and finance. Dymski (1988) criticizes neoclassicists’ assumption that the dual functions – liquidity supply and credit creation – always operate independently (see e.g. Baltensperger, 1980; Klein, 1971). Rather, he sheds light on the inevitable tension between these functions, as banks are not able to pre-coordinate the dual functions that are non-synchronous but
interdependent due to their irreversibility in a “real-time” manner. In this manner, a substantial loss of depositors will significantly reduce the profitability of banks since the size of the loan portfolio is limited by the volume of the deposits. For instance, in the 1970s U.S. commercial banks had rapidly lost loan customers while money market funds – the substitute of bank deposits – had emerged in the market. Banks have pursued two possible structural solutions in order to cope with this functional vulnerability. On the one hand, they have sought effective ways to improve their competence. On the other hand, they have endeavored to diversify their funding sources while having reduced the dependence on deposits.

To restore their competence, since the 1980s there has been a consistent trend toward consolidation in the banking sector in the U.S. and Europe (Berger et al., 1999; Dymski, 1999; Rhoades, 2000). Radical regulatory changes, e.g. the dissolution of the New Deal banking system that was characterized by its segmented and restricted-competition in the U.S., have also fueled mergers and acquisitions (M&As) among financial institutions (Ball, 1990; Dymski, 1996). A number of studies on banking and finance suggest banks are able to improve their efficiency through M&A, as that activity will lead to increasing returns to scale, scope, or product mix (Avery et al., 1999; Berger and Mester, 1997; Hughes et al., 1996).
However, it is questionable whether banks actually restore their competence by increasing their internal efficiencies. This is primarily because M&A activity can lead to oligopolistic abuses, unless the financial market is contestable (Hannan, 1991). Hence, bank consolidation also allows banks to enhance their competence by increasing access to ‘the lender of last resort’ (Ashton, 2011; Ball, 1990; Saunders and Wilson, 1999) or by increasing their market power of price-setting (Vennet, 1997).

At the same time, in order to diversify funding sources, banks have fostered wholesale funding (Ball, 1990). If banks had not reduced their dependence on deposits, they might have also collapsed like thrifts that had relied exclusively on profit from spread between deposit and loan rates. Subsequent to the diversification of funding channels, there have been a couple of remarkable shifts in the business of banking. First, banks have significantly expanded their retail banking presence in order to recoup their losses from corporate banking, as corporate customers turned to direct credit markets to secure funds (Dymski, 1996). For example, banks have consistently expanded their mortgage business by increasing off-balance sheet activities such as securitization (Davidson et al., 2003; Immergluck, 2009). Second, as capital markets have come to play a much more important role in the funding process, it has been one of the
greatest priorities of banks to maximize shareholders value (Berger et al., 1999). This equity-market rationale has exerted significant pressures on banks to pursue short-term profits by expanding fee-based services and by raising payouts (Arsalidou, 2016).

As the banking sector has become more consolidated and banks have enlarged their influence over the retail market, the imbalance of power between financial intermediaries and retail consumers has inevitably been exacerbated. This burgeoning imbalance in the retail banking sector eventually results in financial exclusion. Most importantly, financial exclusion in recent decades does not simply refer to the absence of credit or the limited supply of credit. Rather, it refers to a mechanism that the banking system sorts and differentiates its customers based upon their financial capacity such as the levels of income, wealth, and creditworthiness. That is, following this principle, banks have offered products and services unevenly available across the market segments: “one group is left with costless access to money and plentiful credit, and the other with costly money and limited access to borrowing” (Dymski, 1996, p. 94).

It is important to note that physical and social distancing still are pervasive in some inner cities (Leyshon and Thrift, 1995; Pollard, 1996). This ‘flight-to-quality’ principle, however,
inadequately satisfies the increasing risk appetite of banks, which stems from bank consolidation and market integration. Instead, banks actively seek safer and more profitable markets, which seem irreconcilable, through the retail market bifurcation (Dymski, 2005; Wyly et al., 2009). The bifurcation decisively allows banks to pay more attention to aggregate return and risk (Burton, 1994). That is, although banks might not simultaneously lower risk and increase return in each consumer segment, they would still accomplish these overarching goals at the aggregate level. Due to cross-subsidization, however, the benefits of bifurcation cannot equally be distributed across different consumer segments. As a result, the bifurcation not only sorts and differentiates consumers based on their inherited financial capacity, but also exacerbates the wealth gap between segments while individuals and households depend on retail banking in order to accumulate wealth.

In summary, a post-Keynesian banking model deliberately examines the underlying mechanics of growing wealth inequality, as it situates such subtle mechanics on the basis of atomistic interactions between banks and retail customers. This agent-based framework consequently explicates how macro-structural shifts in banking and finance have eventually come down to a matter of wealth inequality. Due to its focus on the formal financial instruments and institutions,
however, this banking-centered framework inadequately situates growing wealth inequality in the Global South, where the informal system plays a deciding role in accumulating wealth. My premise is that this banking-centered model needs to adapt to distinct *de facto* regimes of accumulation that are entrenched in the whole economic system in order to shed light on the true nature of wealth concentration in the Global South.
2.4 **Conceptual Framework and Research Design**

2.4.1 **Conceptual Framework**

This study aims to develop a new model to examine distinct mechanics of wealth concentration in the Global South in recent decades. To achieve this goal, this study builds its conceptual framework by synthesizing the excellence of cultural political economy of financial globalization and post-Keynesian perspectives on banking and finance.

The virtue of the cultural political economy approach is with its emphasis on evolutionary mechanisms in shaping distinctions in a certain economy from historical and structural construction. On the basis of this merit, scholars are able to explicate a *de facto* regime of accumulation that has been evolved in a specific socioeconomic circumstance. Furthermore, the key idea behind this theory of financial globalization is that the imbalance of power between those who follow the intrinsic norms and institutions and those who accept the extrinsic universal order encourages the emergence of a new hegemony. This dialectical framework allows scholars to posit the increasing dissonance between *de facto* and *de jure* regimes of accumulation as the driving force of wealth inequality.
At the same time, a post-Keynesian banking model that fundamentally characterizes atomistic interactions between agents can effectively situate the evolving dynamics between stakeholders, accompanied by financial liberalization, integration, and exclusion. By shedding light on such subtle mechanisms, scholars are able to examine how macro and structural changes reorient the attitudes of a constellation of agents.

2.4.2 Case Selection: Korean Economy

To develop a novel model that examines growing wealth inequality in the Global South, this study particularly scrutinizes increasing wealth disparity in Korea in recent decades, which has been provoked by greater financial globalization. Korea is one of the economies that have rapidly transitioned from a Fordist regime toward a post-Fordist regime. Since the Asian Financial Crisis of 1997 struck the Korean economy, it immediately embraced the new global financial order due to the wide-ranging interventions of the International Monetary Fund (IMF). As a result, over the past couple of decades, there have been radical and far-reaching financial liberalization and integration in Korea.

These drastic reforms, however, have not only been located within the financial market. Rather,
the extensive interventions led by the IMF have fundamentally restructured the whole socio-economic system. Notably, more than any other types of intervention, the structural reforms of the labor market have played a decisive role to reconstitute the relationship between economic and social insecurity. Despite the under-developed social security system, prior to the regime shift, the practice of “life-time employment” had protected the workforce from risk and uncertainty as it had substantially altered the role of a social safety net. The drastic labor market reforms, however, directly broke a weak linkage between economic and social security that had bolstered the quasi-social protection. As employees no longer expect such quasi-social protection, emerging economic insecurity leads to growing social insecurity in the new era.

These structural shifts have paradoxically promoted wealth accumulation through real estate ownership despite reductions in demand for space led by demographic trends such as low fertility and rapid aging. This implies that real estate ownership is a functionally unneeded but financially necessary option for many households to cope with increasing economic and social insecurity under this finance-led growth regime. That is, in recent decades households who are either losing opportunities to become real estate owners or losing their homeownership will structurally be more vulnerable to risk and uncertainty.
The banking and financial sector has exactly seized this opportunity. Since the Asian Financial Crisis of 1997, there has been a remarkable debt shift from corporate to consumer holdings – in particular, the explosive growth in residential mortgage lending. Interestingly, contrary to the common belief that market reform that accompanies financial innovation and greater access to credit motivates households to become homeowners, such radical debt shift does not seem to have effectively promoted homeownership. Rather, this strategic shift in banking and finance seems to have reversely hindered wealth accumulation, as it has increasingly created junctions that transfer risk and uncertainty in the financial market into individual households.

Most importantly, in order to understand these distinct and subtle dynamics, it is unequivocally necessary to grasp the key properties of a distinct *de facto* regime of accumulation and its accompanying mode of regulation – the *Chonsei* system that is characterized as a non-institutional, unregulated and informal housing finance system in this dissertation research – and to shed new light on the emerging dissonance between formal and informal housing capital. In this context, this study clearly situates inequalities in wealth that are set in motion through the restructuring of the housing finance system in Korea.
This study seeks its external validity from its implications for growing wealth inequality in other emerging economies. It is important to note that emerging economies such as Iran and Bolivia also have unique quasi-rental arrangements – Iranian *Rahn* and Bolivian *Anticretico* – that are nearly identical to the *Chonsei* system (Koutlaki, 2010; Navarro and Turnbull, 2010). Causal explanations for these peculiar practices have varied: micro- and macro-economic conditions (Ambrose and Kim, 2003; Farfan, 2004), political-economic environments (Fanni, 2006), and distinctive properties of their legal systems (Navarro and Turnbull, 2010). However, undoubtedly, these practices have commonly worked as dominant modes of regulation in those economies. As this study provides a novel lens into evolving wealth inequality within the emerging tension between *de jure* and *de facto* regimes of accumulation in the Global South in the era of financial globalization, future studies are expected to be able to address the true nature of growing wealth inequality in those economies within this framework.

2.4.3 **Research Question and Overview**

This study raises three main questions and the accompanying sub-questions in order to situate the distinct nature of wealth inequality in Korea resulting from greater financial globalization over the past couple of decades.
[Question. 1] Unique Development of the Korean Housing Finance

Why and how has the *Chonsei* system worked as a distinct mode of regulation in Korea?

[Sub-questions]

- What circumstances had led to the emergence of this distinct mode of regulation?
- Why and how has the *Chonsei* system recently been challenged?
- What are the main consequences of the emerging dissonance between *de jure* and *de facto* regimes of accumulation?

Chapter 3 addresses these questions by focusing particularly on two distinct forces – formal and informal [housing] capital – that have created the unique development path of the housing finance system in Korea.

Over the past century, Korea’s financial regimes that can be characterized as Colonial Capitalism and State Capitalism had significantly affected credit allocation in the housing finance market. Even though they had set up different goals and principles, their effects were more of the same:
households had consistently encountered an insufficient supply of credit, while those regimes had intentionally restrained credit expansion to retail sectors. As a result, most households had no choice but to depend on non-institutional, unregulated and informal housing capital, *Chonsei*, in order to accumulate their own wealth. As Korea has immediately embraced the new global financial regime since the 1997 Asian Financial Crisis, there has been dramatic debt shift from corporate to consumer holdings. The explosive credit expansion under this financial regime, however, has not effectively promoted wealth accumulation, as households have simultaneously been exposed to financial vagaries through the emerging tension between the formal and informal housing finance systems.

In summary, the transformation of the Korean housing finance system can be depicted as the history of continuous challenges, which refer to forces that have hindered wealth accumulation based upon the mechanism of financial exclusion, and responses, which refer to counteractions that seek alternative modes of wealth accumulation. This study consequently situates inequalities in wealth that are set in motion through the chronic tension between formal and informal housing capital.
[Question. 2] Increasing Household Debt Dependency under the New Financial Regime

Why has there been the drastic debt shift from corporate to consumer holdings in Korea over the past decade?

[Sub-questions]

• How has residential mortgages debt outstanding consistently increased despite the strict macroprudential regulations?

• How do banks transfer their business risks onto the space market where the Chonsei system operates and, eventually, to individual households?

Chapter 4 examines why and how there has been the radical debt shift from corporate to consumer holdings in Korea over the past decade. This study differs significantly from previous macro studies by adopting a microfoundational framework and considering entrenched peculiarities of the market. This research program can consequently rebut the common belief that macroprudential polices have worked effectively in Korea and demonstrate the mechanics of how ill-designed macroprudential regulations can result in emerging moral hazard problems for banks and have limited power to control the increasing debt dependency of households.
Within strict Loan-to-Value (LTV) limits, banks are willing to approve mortgage loans unless borrowers fail to secure a down payment since lenders have a larger cushion against losses in cases of default. At the same time, despite the strict regulatory environment, unregulated housing credit such as Chonsei typically allows borrowers to relax their down payment requirements. As a result, even strict LTV prudential limits will have limited power to control the increasing debt dependency of households as long as the unregulated credit can easily be accessed. Furthermore, this demand-driven mechanism of mortgage lending implies that perceived financial market stability may have been achieved by increasing space market instability.

I test this proposition through an empirical analysis of the Korean housing finance system using a panel instrumental variables regression approach. The empirical results indicate that over the past decade there has been an explosive growth in residential mortgage lending despite the strict macroprudential limits, as banks can transfer their business risks that would normally be hedged in the financial market onto the space market where the Chonsei system operates.
[Question. 3] Growing Wealth Inequality and Economic and Social Insecurity

**How can the radical debt shift eventually lead to wealth inequality in Korea?**

[Sub-questions]

- Why and how have households had more difficulty building wealth as household dependency on institutional debt has increased?
- How can we characterize the linkage between real estate ownership and economic and social insecurity under this finance-led growth regime?

Chapter 5 examines how such a radical debt shift has constructed barriers for household wealth accumulation. This study particularly focuses on investigating the degree to which households’ vulnerability to risk and uncertainty can be differentiated according to the capital structure of their real estate ownership. Unlike the *Chonsei* system, which requires infrequent debt payments, institutional mortgages require periodic debt payments, which compel households that leverage mortgages to be exposed to risk and uncertainty more often. That is, risk and uncertainty are less likely to be realized while households leverage the *Chonsei* deposit rather than institutional debts.
In order to examine the relationship between households’ capital structure and their serial tenure and portfolio choice, this study employs a multinomial logit model with fixed effects on the basis of annual panel data drawn from the Korean Labor and Income Panel Study (KLIPS). The empirical results indicate households whose debt structure only consists of the *Chonsei* deposit have higher probabilities of maintaining their real estate ownership despite the impact of risk and uncertainty such as employment and health insecurity and property price depreciation.

This result rebuts the common belief that market reform that accompanies new products and services, lower interest rates, and greater liquidity substantially motivates households to purchase real estate. Rather, increasing institutional debt dependency has made households significantly more vulnerable to risk and uncertainty and subsequently experience barriers to building wealth.
2.5 **Cited Literature**


3. THE UNIQUE DEVELOPMENT OF THE KOREAN HOUSING FINANCE

3.1 Introduction

Despite the evident development of the financial market in the 20th century, strong demand for non-institutional and informal housing capital had persisted in Korea. During the first half of the 20th century, Colonial Capitalism focused primarily on promoting Japan's imperialistic expansion and supporting its war effort. The following financial regime that is referred to as State Capitalism aimed at allocating financial and non-financial resources to conglomerates, the Chaebols, and their businesses in order to support export-driven industrialization. Given these circumstances, the Chonsei system alternatively and effectively promoted households’ homeownership and wealth accumulation.

Notably, under the financial regime in the 21st century, referred to as Financial Capitalism, individuals and households have been able to have greater access to liquidity in the housing market. The explosive credit expansion under this new financial regime, however, has not effectively promoted wealth accumulation, as households have increasingly been exposed to financial vagaries under the emerging dissonance between formal and informal housing capital.

To sum up, the transformation of the Korean housing finance system can be depicted as the
history of continuous challenges, which refer to forces that have hindered wealth accumulation based upon the mechanism of financial exclusion, and responses, which refer to counteractions that seek alternative modes of wealth accumulation. This chapter focuses particularly on this chronic tension that has led to the unique development of the Korean housing finance over time.
3.2 Emergence of Informal Housing Capital

3.2.1 Active State Intervention in Credit Allocation

The chronological changes in Korea’s financial regime have significantly affected credit allocation in the housing finance market. During Japanese colonization in the early 20th century, the Korean economy initially adopted a modern financial system, which promoted the systematic and institutional development of the financial market. The financial system mainly aimed at promoting Japan’s imperialistic expansion and supporting its war effort – an arrangement referred to as Colonial Capitalism (Cole and Park, 1983). Even though it allowed Koreans to have some access to modern financial institutions, they primarily depended on traditional institutions\(^1\) both as outlets for their savings and sources for their borrowings (Campbell and Ahn, 1962). In addition, during the Korean War, key elements of the financial development program were severely damaged and abandoned for the sake of financing the war (Cho, 1989; Cole and Park, 1983). Consequently, under a situation of limited access to institutional credit, most Koreans had no choice but to depend on non-institutional and informal systems in order to finance homeownership.

\(^1\) Two prominent examples, *Kye* and *Mujin*, also known as rotating savings and credit association, traditionally worked as voluntary private associations that pooled resources to give loans to members.
When the Korean War ended with the armistice of 1953, the state turned its attention to the restoration of the devastated economy. By implementing export-driven industrialization, the Korean economy was able to achieve spectacular growth in the post-war period (Peet, 1991; Stiglitz, 2002). This tremendous success significantly relied on global economic linkages such as international subcontracting (Castells, 1993; Hart-Landsberg 1984; Stubbs, 1999). However, endogenously, this era produced a distinct path for government-led economic development, characterized by three main elements: the Chaebols, State Capitalism and households.

*Chaebols* are large, diversified conglomerates such as Samsung, Hyundai, LG and Daewoo, which have dominated the Korean economy since the 1960s. In order to cultivate the *Chaebols* as globally competitive organizations, the state allocated all available resources to them and their businesses. They enjoyed excess profits due to *Chaebol*-friendly policies and subsidies (Kim and Cho, 1999; La Grange and Jung, 2004). Strong barriers to entry, built by the state regulations, also reduced competitive pressures and permitted monopolistic coordination (Kim and Cho, 1999). Furthermore, investments in public education allowed them to secure high-quality but relatively cheap labor forces (Stiglitz, 2002).
State Capitalism, which refers to a public central authority with the power to control interest rates, credit, and the allocation of financial capital directly and indirectly, was at the heart of nurturing the Chaebols. The supreme task of this authority was not only located within the cultivation of the Chaebols, but was also placed within the protection of the Chaebols, considered to be the key source of national wealth, from transnational capital. To achieve these overarching goals, it was important to control cross-border financial flows, as well as the domestic capital market (Chang et al., 1998; Kim and Cho, 1999; Stiglitz, 2002). As a result, the state primarily promoted a bank-based system, rather than a capital market-based system, as the dominant way of financing enterprise or investments (Kim and Cho, 1999). The industrial sector could raise capital mainly through bank loans rather than by issuing bonds and stocks, while the state strictly controlled cross-border financial flows.

In order to complete this ecosystem, inexorably, households needed to be multi-tool players. First, households were relied upon to purchase the goods and services of the Chaebols in a monopolistic market. Second, households provided high-quality, low-cost labor forces for the Chaebols. Excess profits, which the Chaebols had earned in the domestic market, and cost efficiencies, obtained by taking advantage of low-cost labor, were utilized to achieve price
competitiveness in the global market. Third, and most importantly, the savings of households were instrumental in financing the *Chaebols*. This was inevitable because savings were an essential prerequisite in the formation of the bank-based system. Consequently, the state not only maintained high interest rates to impel households to be positioned as the predominant savers to finance the *Chaebols*,² it also discouraged housing consumption by deliberately preventing the mortgage market from developing.³

![Diagram](image)

**Figure 1** Three main elements for the government-led economic development

² High lending rates, pegged to high savings rates, had not been a critical issue for the *Chaebols* since the state subsidized those conglomerates.

³ After acquiring the necessary consumer durables, households tend to reduce their savings (Stiglitz and Uy, 1996).
As a result, strong demand for alternative sources to finance real estate ownership persisted despite the rapid financial development under the State Capitalism. This is how the *Chonsei* became the dominant type of non-institutional, unregulated and informal housing capital over time.

### 3.2.2 Chonsei System: A Distinct Mode of Regulation

*Chonsei* is one of the indigenous practices in the Korean space market. This unique tradition was initially recorded in the end of the Joseon dynasty, when the idea of private land ownership begun to develop in this monarchy (Yoon, 2009). The *Chonsei* system of housing tenure has been standardized, as this quasi-rental agreement has become pervasive and universal under the insufficient supply of institutional credit. Currently, it can be best understood as a two-year lease agreement in which the tenant pays an up-front deposit, typically about 40 percent to 80 percent of the value of the property, without a requirement for periodic rent payments. At the end of the rental term, the tenant can move out upon receipt of the same amount of deposit or renew the contract with the current landlord on the basis of the new market value of the property.
Even though *Chonsei* refers to a type of lease agreement or tenure mode, it should be understood in the context of wealth accumulation or the method of financing real property ownership. When a landlord leverages the sufficient *Chonsei* deposit, she does not have to depend on institutional mortgage loans or her equity for down payments as long as the deposit contributes a sizable proportion of the property value (Ambrose and Kim, 2003; Lee et al., 2002). This system is also valuable for tenants since there is no expenditure except loss of the opportunity costs of the *Chonsei* deposits. This implies that *Chonsei* typically allows tenants to spend less money on housing compared to what they would in a monthly-rental system.

I shift the focus of attention toward historical and structural circumstances, where the *Chonsei* system has developed as the dominant option for financing real estate ownership. Assume that there is a private landlord who has two possible leasing options for her operating income: monthly-rental and *Chonsei*, which are substitutes. With respect to the user costs of housing approach, *Chonsei* should be preferred to monthly-rental, unless its opportunity cost (the loss of rental property income) does not exceed the reduction of her funding costs to buy the property (derived from the substitution of mortgages as well as down payment by the *Chonsei* deposit).
plus the savings income (derived from the *Chonsei* deposit).\(^4\)

Notably, both savings and lending interest rates were likely to be high in the Fordist regime, since the state aimed to nurture the *Chaebols* within the bank-based system. That is, the state not only maintained high savings interest rates to promote household savings to finance the *Chaebols*, it also restrained the supply of mortgage credit by retaining higher mortgage interest rates. Given these circumstances, *Chonsei* is accordingly preferred to monthly-rental due to two possible effects. While a private landlord chooses *Chonsei* as a leasing option, she is able to lower the costs of financing for the real property ownership as it can work as a financing option.

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\(^4\) Suppose that there is a private landlord, who has two available choices while owning a property: monthly-rental and *Chonsei*, which are substitutes. To derive the capital structure of each option, let the value of the property \(V\) be decomposed by the capital structure \(V = M + E\), where \(M\) is the mortgage, subject to her income, and \(E\) is the down payment, subject to her wealth. Given the assumptions, the *Chonsei* deposit \(D\) can substitute for \(M\) and/or \(E\), and hence we can denote \(V = M + D + E\).

To derive the functions of revenues and costs, in addition, let \(r\) denote the property income rate, \(i_m\) denote the mortgage interest rate, \(i_s\) denote the savings interest rate, and \(g\) denote the rate of capital gains (the annual percentage change in real property values). It is important to note that, to simplify the functions, I disregard factors that are indifferent between *Chonsei* and monthly-rental, such as the depreciation and the property tax. Reflecting the common practice in the Korean real estate market, I neglect income tax effects as well.

As long as she secures a tenant, the annual revenues (from savings interests of the *Chonsei* deposit and capital gains), \(R_c\), and costs (from mortgages payment and the opportunity costs of the equity), \(C_c\), of *Chonsei* can be depicted as \(R_c = i_sD + gV; C_c = i_mE + i_sE\); the annual revenues (from property income and capital gains), \(R_{mr}\), and costs (from mortgages payment and the opportunity cost of the equity), \(C_{mr}\), of monthly-rental can be described as \(R_{mr} = rV + gV; C_{mr} = i_mM + i_sE\).

In order to maximize her profit, as long as \(R_c - C_c > R_{mr} - C_{mr}\), *Chonsei* should be preferred to monthly-rental. We can denote this inequality as \(i_m(M - M_c) + i_s(E - E_c) > (rV - i_sD)\). Recall that \(D\) can substitute \(M\) and/or \(E\): \(D = (M - M_c) + (E - E_c)\). Finally, we can denote the inequality as \(rV < (i_m + i_s)(M - M_c) + 2i_s(E - E_c)\); that is, under the condition that \(rV < (i_m + i_s)\Delta M + 2i_s\Delta E\), *Chonsei* should be preferred.
to be substituted for the mortgage as well. In particular, the higher the interest rate on the mortgage and/or the higher the proportion of the mortgage that is replaced by the *Chonsei* deposit, the lower the cost of financing.\(^5\) At the same time, the higher the savings interest rate, the higher her savings income will be, as landlords typically put the deposits into their savings accounts during the rental period.\(^6\) As a result, the *Chonsei* system consistently encouraged individuals to invest in real estate by diminishing the necessities of institutional debt and/or their own equity for the investment and by allowing them to pursue stable savings income.

It is important to acknowledge that this mechanism can operate smoothly if and only if *Chonsei* is at least as preferred as monthly-rental for tenants as well.\(^7\) Generally, tenants prefer *Chonsei* to monthly-rental since it typically allows tenants to spend less money on housing compared to what they would in a monthly-rental system. However, while reflecting the default risk of landlords, *Chonsei* cannot be a preferable option for tenants because they may fail to receive the same amount of deposit. Despite this structural vulnerability, *Chonsei* actually worked as a safe

\(^5\) Intuitively, greater \(i_m\) and/or greater \(\Delta M\) will increasingly satisfy the condition that \(rV < (i_m + i_s)\Delta M + 2i_s \Delta E\), which implies *Chonsei* is preferred to monthly-rental.

\(^6\) In the same vein, greater \(i_s\) will increasingly satisfy the condition that \(rV < (i_m + i_s)\Delta M + 2i_s \Delta E\).

\(^7\) If not, the operating income of each leasing option will be varied, as each option reveals the different level of vacancy risk.
vehicle for tenants. This was primarily possible because tenants scarcely were exposed to negative equity risk due to the strong upward tendency of home prices led by the rapid industrialization and urbanization in the Fordist regime (Kim and Suh, 1993). In addition, the deposit is legally protected as an asset (Yoon, 2009), so this potential risk barely was realized.

Given these circumstances, the Chonsei system created a typical path of wealth accumulation over the life-cycle: from a monthly-rental tenant to a landlord. Tenants typically made efforts to increase their savings to purchase their future home since homeownership delivered enormous capital gains due to the strong upward tendency of home prices. Furthermore, individual households had little choice but to pursue homeownership due to the under-developed capital markets that was intended to protect the Chaebols from cross-border capital flows. In order to shorten the time needed to purchase a home, the Chonsei system of housing tenure was strongly preferred since it allowed tenants to spend less money on housing compared to what they would in a monthly-rental system. Even though a Chonsei deposit was equivalent to about 40 percent to 80 percent of the value of the property, tenants did not necessarily rely on inherited wealth in assembling the deposit. This was primarily possible on account of rapid economic growth and high savings interest rates in the Fordist regime. This implies the Chonsei system of housing
tenure was available to many tenants regardless of whether they had had inherited wealth.

When Chonsei tenants became owner-occupiers, their deposit was transitioned toward the down payment on their home. At the same time, they were able to acquire other real property by leveraging the Chonsei deposit in which their tenant would pay, while they did not have to depend on institutional mortgage loans or their equity for down payments. Consequently, the Chonsei system was positioned as the distinct mode of regulation in Korea, as this quasi-rental arrangement has worked as non-institutional, unregulated and informal housing capital over time.
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<td>32.2</td>
<td>21.5</td>
<td>15.3</td>
</tr>
<tr>
<td>Rental</td>
<td>14.7</td>
<td>22.5</td>
<td>23.8</td>
</tr>
<tr>
<td>Free</td>
<td>1.9</td>
<td>2.5</td>
<td>2.0</td>
</tr>
<tr>
<td>Daejeon Owner</td>
<td>51.2</td>
<td>52.0</td>
<td>50.8</td>
</tr>
<tr>
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<td>28.9</td>
<td>23.1</td>
<td>19.6</td>
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<td>26.9</td>
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<td>2.9</td>
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<td>2.7</td>
</tr>
<tr>
<td>Ulsan Owner</td>
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<td>14.8</td>
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<td>20.2</td>
<td>22.4</td>
</tr>
<tr>
<td>Free</td>
<td>4.3</td>
<td>3.6</td>
<td>3.1</td>
</tr>
</tbody>
</table>

Notes: The summation may not yield to 100% due to rounding. SMA is the abbreviation for Seoul Metropolitan Area.
3.3 Growing Tension between Formal and Informal Housing Capital

3.3.1 Drastic Market Reforms in the Era of Financial Capitalism

This unique housing finance system faced a major turning point in the wake of the Asian Financial Crisis of 1997. Beginning in the early 1990s, the strategy of export-led growth experienced difficulties due to economic rivals, such as China and India. *Chae bols* inevitably required large investments in order to restore their competitiveness (Kim and Cho, 1999; Stiglitz, 2002). At the same time, the Korean economy also confronted a significant wave of financial globalization in the form of an evolving supra-national policy framework that seeks to increase the transnational mobility of capital (Peet and Hartwick, 1999; Sassen, 2000). As a result, the Korean government started substantially relaxing its control over the financial sector under pressure from the rise of Financial Capitalism (Chang et al., 1998). As *Chae bols* began to borrow abroad to meet their capital needs, the firms exposed themselves to the vagaries of the international capital market (Stiglitz, 2002). These problems grew to a crisis point in 1997, when a continued trade deficit, over-leverage by *Chae bols*, a banking system nearing insolvency, and an increasingly volatile currency, prompted direct IMF intervention to stem the growing financial crisis.
The IMF package had two main purposes: financial market stabilization in the short-term and structural reforms to rectify the problems that caused the crisis in the long-term. The stabilization of the market was achieved by higher interest rates and cutbacks in government spending in order to persuade international lenders “to roll over their loans, and to persuade hot money to look elsewhere for easy targets” (Stiglitz, 2002, p. 96). Meanwhile, the structural reforms aimed at increased openness and transparency of the market and altered regulatory environments following the key principles of financial globalization.

It is important to note that these drastic reforms were not only located within the financial market. Rather, the extensive interventions led by the IMF fundamentally restructured the whole socio-economic system. Notably, more than any other types of intervention, the structural reforms of the labor market have played a decisive role to reconstitute the relationship between economic and social insecurity. Despite the under-developed social security system, prior to the regime shift, the practice of “life-time employment” had protected the workforce from risk and uncertainty as it had substantially altered the role of a social safety net (Kim and Park, 2006). The drastic labor market reforms, however, directly broke a weak linkage between economic and social security that had bolstered the quasi-social protection (Chang, 1998; Koo, 2000). As
employees no longer expect such quasi-social protection, emerging economic insecurity eventually leads to growing social insecurity in the new era.

These structural shifts have paradoxically promoted wealth accumulation through real estate ownership despite reductions in demand for space led by demographic trends such as low fertility and rapid aging.8 This implies that real estate ownership is a functionally unneeded but financially necessary option for many households to cope with increasing economic and social insecurity under this finance-led growth regime. That is, in recent decades households that are either losing opportunities to become real estate owners or losing their ownership will structurally be more vulnerable to risk and uncertainty.

The pursuit of homeownership with the lack of demand for space is also supported by structural aspects of the market in the post-crisis era. Historically, many countries have endeavored to promote the spending of accumulated housing wealth in order to emerge from recession (Case et al., 2005). Along these lines, in recurring crises, the Korean government has repeatedly relaxed the housing market regulations to prevent home price depreciation in order to bolster household

---

8 It is important to note that the demographics trend is significantly related to the increasing economic and social insecurity led by the market reforms.
spending. At the same time, in order to cope with the asset price depreciation, the financial authority such as the Financial Supervisory Service has also encouraged banks to increase the supply of mortgage credit in a countercyclical manner. Notably, the state still exercises substantial influence over the financial market, despite the extensive market reforms that led to fundamental changes in regulatory environments. This is primarily possible because government-owned banks and pension funds have become the large shareholders of commercial banks through the market restructuring, even though the state no longer has control over the market directly.

3.3.2 **Strategic Shift in Retail Banking and Changes in Social Efficiency**

The banking sector has seized this opportunity. Since the Asian Financial Crisis of 1997, there has been a remarkable debt shift from corporate to consumer holdings – in particular, the explosive growth in residential mortgage lending (Doucette and Seo, 2011; Kang and Kim, 2010; Park et al., 2010). On the one hand, this radical debt shift may be the consequence of financial development that has stabilized interest rates and increased the supply of credit over time. That is, financial innovation and deregulation may have played a decisive role in opening up more access to credit for retail consumers (Chiquier and Lea, 2009). On the other hand, and more
importantly, this drastic debt shift may stem from the strategic shift in the Korean banking and finance system: the new system has incentivized banks to issue more loans while simultaneously spurring a change in the type of credit provided.

Figure 2 Korean commercial banks’ lending to corporates and consumers

Units: trillions of KRW (nominal value) and percent
Notes: KRW (the South Korean Won) refers to the currency of South Korea.
The most common feature of the banking sector in the era of financial globalization is a strategic transformation in the nature of the business, since a traditional model of generating profit from spread between bank deposit and loan rates does not work well in competitive circumstances, brought on by the deregulation and integration (Ball, 1990; Dymski, 1996). Consequently, banks are trying to recoup their losses by seeking new markets and customers, creating new business lines and products, and improving their internal efficiency under the new global financial order.

In the wake of the 1997 Asian Financial Crisis, endogenously, Korean commercial banks have been much more cautious in the risk embedded in the corporate banking that led them into becoming nearly insolvent (Banker et al., 2010). This circumstance has eventually led to the fundamental change in risk appetite of banks. At the same time, as Chaebols also turned to direct credit markets for most of their financing needs, the banks have inevitably shifted their focus of attention toward retail banking – in particular, mortgage business.

Mortgage lending has satisfied Korean banks’ needs and concerns in manifold ways. First of all, banks can easily shift risk back onto borrowers by limiting their products and services. For instance, the fact that the most common type of mortgages have been adjustable rate mortgages
with terms of less than 5 years implies that banks have shifted their interest rate and liquidity risks onto borrowers. In addition, global capital frameworks, such as Basel II, have offered favorable treatment for mortgage loans since the regulatory capital requirements are lower for retail and mortgage loans as compared to corporate or inter-bank loans (Shin, 2006). Lastly, and most importantly, the regulatory environment of the mortgage market has protected banks from uncertainty. In particular, due to strict macroprudential limits such as Loan-to-Value (LTV) and Debt-to-Income (DTI) prudential limits, banks can minimize their losses when borrowers default (Park and Bang, 2014).

As a result, household mortgage debt in Korea is rising at its fastest pace over the past decade. Interestingly, contrary to the common belief that market reform that accompanies financial innovation and greater access to credit motivates households to become homeowners, such radical debt shift does not seem to have effectively promoted homeownership (see Figure 3). That is, it is ambiguous whether new, diversified products and services, lower interest rates, and greater liquidity, considered as the key evidence of increased market efficiency, have created opportunities sufficient to promote homeownership. My premise is that the possible positive effects of increased market efficiency on homeownership have substantially been offset by the
shrinkage of the non-institutional, unregulated and informal housing finance system – the Chonsei system. Hence, in order to understand the true nature of the strategic shift in banking, it is necessary to shed light on the structural dynamics between formal and informal housing capital.

**Figure 3** Mortgage debt dependency of households and homeownership rates

Units: trillions of KRW (nominal value) and percent  
Notes: KRW (the South Korean Won) refers to the currency of South Korea.  
With respect to the macro dimensions of banking, over the past decade the explosive growth in mortgage lending has been obtained, as banks can transfer their business risks that would normally be hedged in the financial market onto the space market where the Chonsei system operates.

Korea initially adopted strict macroprudential regulations in order to cope with increasing housing market volatility in the wake of the 1997 Asian Financial Crisis. These policy interventions fundamentally aim at preventing the transfer of risk from the space market to the financial market by limiting the exposure of financial institutions to the space market. However, these ill-designed interventions have resulted in emerging moral hazard problems for banks and have limited power to control the increasing debt dependency of households. Specifically, the LTV limit restricts mortgage borrowing by requiring a certain amount of down payment. That is, LTV focuses on strengthening the lender's security interest in property in case of default. Within strict LTV limits, consequently, banks are willing to approve mortgage loans as long as borrowers succeed in securing their down payments since lenders have a larger cushion against losses in cases of default. This implies that mortgage lending decisions can be a demand-driven mechanism rather than a supply-driven mechanism under strict LTV regulations.
Figure 4 The mechanics of LTV prudential limit

Notes: It is important to note that mortgage lending will occur if and only if the sum of a mortgage and a down payment is equal to the collateral value of a house. Consequently, if the financial authority, the Korean Financial Supervisory Service, lowers LTV limits, mortgage lending cannot occur unless households succeed to secure additional down payments. Based upon this simple mechanics, this instrument may stabilize potential overheating in housing markets by limiting the volume of mortgages. At the same time, this policy tool may also protect financial market from housing market volatility by limiting the exposure of intermediaries to the property market. Along these lines, in 2002 Korea adopted strict macroprudential limits that since have been adjusted in a countercyclical manner ranging from 40 percent to 70 percent in order to cope with increasing volatility in house price in the wake of the 1997 Asian Financial Crisis.

At the same time, the Chonsei system that is not directly regulated by the macroprudential policies typically allows private landlords among borrowers to relax their down payment requirements. Hence, even strict LTV prudential limits have limited power to control the mortgage debt dependency of households as long as they have access to this non-institutional,
unregulated and informal housing credit. As a result, over the past decade there has been explosive growth in residential mortgage lending despite the strict macroprudential limits, as banks create junctions to transfer risk and uncertainty in the financial market into the space market.

**Figure 5** Do strict LTV limits operate as they intended?

Notes: Strict LTV limits cannot directly regulate the Chonsei system that operates in the space market, and thus private landlords among borrowers have the greater flexibility of capital structure to finance real estate ownership regardless of the degree to which LTV limits require their down payment. As a result, even strict LTV prudential limits have limited power to control the increasing debt dependency of landlords as long as they have access to this unregulated credit. This ill-designed policy is inadequate for stabilizing the space market volatility as well. Assume a case in which private landlords leverage both institutional mortgage and the Chonsei deposit to finance their real estate ownership. Since strict LTV limits do strongly compel the institutional debt to be senior secured, their Chonsei tenants tend to be exposed to default risk before banks are exposed to the same risk. Hence, this strict regulation is effective to mitigate financial market instability by transferring risks that would normally be hedged in the financial market onto the space market – specifically on to tenants who used Chonsei, rather than by preventing the transfer of risk from the property market into the financial market.
As households are increasingly compelled to bear risk and uncertainty in the financial market, decisively, they experience barriers to building wealth. This observation becomes obvious when we examine the degree to which households’ vulnerability to risk and uncertainty can be differentiated according to the capital structure of their real estate ownership.

**Figure 6** Interplay of risk and uncertainty, capital structure, and real estate ownership

Notes: The difference between Chonsei and mortgage, which mainly affects the probability of real estate ownership, is within the repayment structures. For instance, while leveraging Chonsei, a landlord is free from the pressure to repay the deposit until the end of the rental term — typically two years. While leveraging mortgages, on the other hand, a landlord normally is exposed to the pressure to repay her debt following a monthly repayment and amortization schedule. As a result, mortgage debt dependency will eventually weaken resilience against risk and uncertainty by forcing households to be exposed to uncertainty more often. That is, households whose debt structure only consists of the Chonsei deposit will have higher probabilities of maintaining their real estate ownership despite the impact of risk and uncertainty.
Unlike the *Chonsei* system, which requires infrequent debt payments, institutional mortgages require periodic debt payments, which compel households that leverage mortgages to be exposed to risk and uncertainty more often. That is, risk and uncertainty are less likely to be realized while households leverage the *Chonsei* deposit rather than institutional debts.

The increasing dependency on institutional debt not only compels households to have more difficulty building wealth, but also fundamentally alters their capacity to cope with economic and social insecurity. It is important to acknowledge that real estate ownership has become a popular option for many households to cope with increasing economic and social insecurity that have consistently been exacerbated under the drastic market reforms in recent decades. Hence, under this new financial regime, temporal risk and uncertainty are highly likely to be transferred into chronic or permanent household economic insecurity, as the institutional debt dependency exerts pressure on households to forgo their real estate ownership.

Future home buyers, who are currently renters, have confronted more brutal conditions to transform their tenure and/or to build wealth. As a rental option for households, *Chonsei* is one of the key endogenous variables that determine their saving and spending decisions. Since *Chonsei* does not require any periodic rent payments, in the Fordist regime the *Chonsei* system
had significantly encouraged renters to become homeowners by reducing their housing cost burdens. *Chonsei* had also worked as a safe vehicle for renters to accumulate wealth, since they scarcely were exposed to negative equity, which can hinder them getting their deposits back, due to the strong upward tendency of home prices over the period. However, as the institutional debt dependency of households has increased and house prices have become more volatile under the new financial regime, *Chonsei* can no longer be a safe vehicle for renters to allocate their asset portfolio. That is, renters are forced to spend more money on housing or voluntarily forego homeownership as landlords exert pressure on their tenants to share risk and uncertainty in the financial market.

At the same time, due to increasing economic insecurity and the structural shifts in the financial market, the *Chonsei* system of housing tenure is no longer possible for most tenants. That is, tenants necessarily and increasingly depend on inherited wealth in assembling the deposit. This implies that there has been a fundamental shift in the inherent sociality of *Chonsei* of housing tenure in the new era: this distinct mode of regulation is not a common, prevalent means of wealth accumulation for tenants any longer. Consequently, we can anticipate that renters increasingly are demotivated to be homeowners with the tension between formal and informal
housing capital.

In summary, the strategic shift of the Korean banking and finance system, which possibly increases market efficiency, has not effectively promoted wealth accumulation through real estate ownership. Rather, as it creates the junctions that can transfer business risk and uncertainty onto their retail customers, households have had more difficulty accumulating wealth. Furthermore, as the institutional debt dependency exerts pressure on households to forgo their real estate ownership that becomes a popular option for many of them to cope with increasing economic and social insecurity in the new era, households increasingly are exposed to chronic or permanent economic insecurity. I strongly believe that if the Korean housing finance market fails to recover the role of Chonsei and/or to develop institutional alternatives to the Chonsei system, the market will severely suffer from the lack of housing demand, stemming from increasing wealth inequality and chronic economic insecurity.
3.5 **Cited Literature**


3.6 Cited Literature in Korean


4. A MACRO STUDY: MACROPRUDENTIAL POLICIES, BANK LENDING AND HOUSEHOLD DEBT DEPENDENCY

4.1 Introduction

In many countries, macroprudential regulations such as Loan-to-Value (LTV) and Debt-to-Income (DTI) limits have broadly been employed to stabilize potential overheating in housing market and to keep credit expansion under the control of financial authority. Along these lines, in 2002 Korea has initially adopted macroprudential limits that since have been adjusted in a countercyclical manner ranging from 40 percent to 70 percent. Under these strict regulations, the Korean economy appears to have been insulated from the vagaries of the Global Financial Crisis of 2008, leading to a common belief that macroprudential policies successfully prevent the transfer of risk from the real property market to the financial market.

Contrary to the common belief that macroprudential polices have worked effectively in Korea, this study demonstrates the mechanics of how macroprudential regulations can result in emerging moral hazard problems for banks and have limited power to control the increasing debt dependency of households. It is important to note that the LTV limit particularly restricts mortgage borrowing by requiring a certain amount of down payment. That is, LTV focuses on
strengthening the lender’s security interest in property in case of default. Within strict LTV limits, consequently, banks are willing to approve mortgage loans as long as borrowers succeed in securing their down payments since lenders have a larger cushion against losses in cases of default. This implies that mortgage lending decisions can be a demand-driven mechanism rather than a supply-driven mechanism under strict LTV regulations. This demand-driven mechanism will operate while borrowers easily have access to unregulated credit that mitigates their own financial burden of real estate ownership.

Notably, the Chonsei system plays such a distinct role in Korea. Chonsei is one of the indigenous practices in the Korean space market. It can be best understood as a two-year lease agreement in which the tenant pays an up-front deposit, typically about 40 percent to 80 percent of the value of the property, without a requirement for periodic rent payments. At the end of the rental term, the tenant can move out upon receipt of the same amount of deposit or renew the contract with the current landlord based upon the new market value of the property. When a landlord leverages the Chonsei deposit, she will have the greater flexibility of capital structure to finance the real estate ownership. As a result, even strict LTV prudential limits have limited power to control the increasing debt dependency of households as long as they have access to this
unregulated credit.9

At the same time, this macroprudential policy is inadequate for stabilizing the space market volatility as well. Assume a case in which private landlords leverage both institutional mortgage and the Chonsei deposit to finance their real estate ownership. Since strict LTV limits do strongly compel the institutional debt to be senior secured, their Chonsei tenants tend to be exposed to default risk before banks are exposed to the same risk.

I test this proposition through an empirical analysis of the Korean case using a panel instrumental variables regression approach. In the first stage regression, the result advocates the role of Chonsei as the preferred substitute of mortgage credit. In the second stage regression, meanwhile, the result confirms the demand-driven mechanism of mortgage lending within strict LTV limits, which is stylized within the microfoundational framework. Furthermore, the empirical result also implies that strict LTV limits can appear to be successful interventions to achieve financial market stability by transferring risks that would normally be hedged in the financial market into the space market where the Chonsei system operates.

9 It is important to note that private landlords among homeowners can only leverage the deposit to finance their homeownership since the Chonsei system is fundamentally a type of lease agreement or tenure mode.
4.2 **Do Strict Macroprudential Limits Operate as They Intended?**

Theoretically, we can presume a two-way causality between credit cycles and real property market cycles. On the one hand, real property prices can affect bank lending behaviors as well as credit demand. Considering a wealth effect, home price appreciation and depreciation may substantially affect households’ credit demand (Gerlach and Peng, 2005; Hofmann, 2001). In addition, since higher collateral values make the problem of asymmetric information less critical to banks, any increase in home prices may loosen the borrowing constraints faced by households (Gerlach and Peng, 2005; Goodhart and Hofmann, 2007). Property prices can also affect banks’ capital position and hence their lending capacity via valuations of their holdings of real properties, the so-called balance-sheet effect (Goodhart and Hofmann, 2007; Oikarinen, 2009).

On the other hand, credit supply may also affect property prices, as expanded (limited) credit availability may increase (decrease) the demand for properties (Allen and Gale, 1999; Collyns and Senhadji, 2002; Liang and Cao, 2007). In line with this theory, in the credit market, both endogenous forces, such as interbank competition, and exogenous forces, such as changes in regulatory environments, may lead to credit expansion (crunch) and hence result in bubbles (crashes) in property prices (Allen and Gale, 1999; Gimeno and Martinez-Carrascal, 2010;
Macroprudential policies, such as LTV and DTI limits, are targeted instruments that can be employed to intervene in both causal directions (Claessens et al., 2013; Galati and Moessner, 2013; Kuttner and Shim, 2016; Vandenbussche et al., 2015). These instruments may control potential overheating in the housing market by limiting the volume of mortgages. At the same time, these policy tools may also protect the financial market from housing market volatility by limiting the exposure of intermediaries to the property market.

Along these lines, the Korean Financial Supervisory Service (FSS) adopted macroprudential limits: respectively, LTV and DTI regulations were introduced in 2002 and 2005 and have since been adjusted in a countercyclical manner ranging from 40 percent to 70 percent (Igan and Kang, 2011; Kim, 2013). By restraining credit expansion, the strict macroprudential limits primarily aimed at stabilizing increasing housing market volatility in the wake of the 1997 Asian Financial Crisis. As a result, the LTV and DTI prudential limits were differentiated at the local and regional level, according to the volatility of each housing submarket. Otherwise, in the

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10 For instance, in the City of Seoul, the LTV and DTI prudential limits have been differentiated even at the municipal district level to stabilize the overheated housing submarkets.
wake of the 2008 Global Financial Crisis, the FSS has focused mainly on securing the resilience of the financial market *per se* by requiring higher levels of liquidity and capital, while the housing market has shown a relatively steady trend rate of growth.

As the Korean economy has embraced financial globalization since the Asian Financial Crisis of 1997, there have been radical and far-reaching market reforms over the past couple of decades. Since the new global financial order has long been recognized as the facilitator of financial liberalization, the strict macroprudential regulations that the Korean financial authority has adopted over time may seem contradictory. The essence of financial liberalization, however, is not only lax regulatory environments *per se*. Rather, it is the fundamental alteration of the role of capital: the development of capital becomes equivalent to economic prosperity under the new financial regime. Following the new normal of markets, the financial authority has endeavored to remove any impediments that may restrain the development of capital. In particular, property-market imperfection is considered to be one of the main factors that can eventually increase financial vulnerability and instability (see e.g. Bostic et al., 2007; Glaeser et al., 2008; Wheaton, 1999), while property and capital markets are increasingly being integrated. In the same vein, strict macroprudential limits under the new financial order fundamentally postulate
the intrinsic instability of property market and aim to prevent the transfer of risk from the property market into the financial market.

Under these strict regulations, the Korean economy appears to have been insulated from the vagaries of the Global Financial Crisis of 2008, which has led to the common belief that macroprudential regulations successfully prevent the transfer of risk from the real property market to the financial market. Many empirical studies including Igan and Kang (2011), Kim (2013), Lim (2013) and Shin and Lee (2013) also suggest that these policy interventions have reduced home values and outstanding mortgages in Korea.

These macro-level studies on the Korean regulatory environments, however, have pitfalls in common. In particular, they focus primarily on examining relationships among macroeconomic indicators, and hence are not grounded in models at the microfoundational level. This leads them to overlook the underlying behavioral shifts of principals and agents as well as peculiarities that are simultaneously path-dependent and structurally constituted in the markets. This study differs significantly from previous studies by adopting a microfoundational framework and considering entrenched peculiarities of the market. As a result, this research
program can rebut the common belief that macroprudential polices have worked effectively in Korea and demonstrate the mechanics of how ill-designed macroprudential regulations can result in emerging moral hazard problems for banks and have limited power to control the increasing debt dependency of households.

To elaborate this ill-designed mechanism precisely, it is first necessary to acknowledge the distinct features between LTV and DTI regulations. Unlike DTI limits that restrict mortgage borrowing according to the debt servicing capacity of a borrower, LTV limits restrict mortgage borrowing by requiring a certain amount of down payment. Namely, DTI focuses on default risk \textit{per se}, whereas LTV focuses on strengthening the lender's security interest in property in case of default. Within strict LTV limits, banks are willing to approve mortgage loans as long as borrowers are able to secure their down payments since lenders have a greater cushion against losses in cases of default. This implies that mortgage lending decisions can be a demand-driven mechanism rather than a supply-driven mechanism under strict LTV limits. This demand-driven mechanism will operate while borrowers easily have access to unregulated credit that mitigates their own financial burden of real estate ownership.
Notably, the *Chonsei* system plays such a distinct role in Korea. *Chonsei* is one of the indigenous practices in the Korean space market. It can be best understood as a two-year lease agreement in which the tenant pays an up-front deposit, typically about 40 percent to 80 percent of the value of the property. Otherwise, it does not require any periodic rent payments. At the end of the rental term, the tenant can move out upon receipt of the same amount of deposit or renew the contract with the current landlord based upon the new market value of the property. When a landlord leverages the sufficient *Chonsei* deposit, consequently, she does not have to depend on institutional mortgage loans and/or her equity for down payments as long as the deposit contributes a sizable proportion of the property value (Ambrose and Kim, 2003; Lee et al., 2002).

Macroprudential policies cannot directly regulate the *Chonsei* system that operates in the space market, and thus private landlords among borrowers have the greater flexibility of capital structure to finance real estate ownership regardless of the degree to which LTV limits require their down payment. As a result, even strict LTV prudential limits have limited power to control the increasing debt dependency of landlords as long as they have access to this unregulated credit.
Strict LTV limits are inadequate for stabilizing the space market volatility as well. Assume a case in which private landlords leverage both institutional mortgage and the *Chonsei* deposit to finance their real estate ownership. Since strict LTV limits do strongly compel the institutional debt to be senior secured, their *Chonsei* tenants tend to be exposed to default risk before banks are exposed to the same risk. That is, the tenants are less likely to receive the same amount of deposit at the end of the rental term, while their landlords experience negative equity. Hence, this strict regulation is effective to mitigate financial market instability by transferring risks that would normally be hedged in the financial market onto the space market – specifically on to tenants who used *Chonsei*, rather than by preventing the transfer of risk from the property market into the financial market.

In summary, given the circumstances where private landlords can easily relax their down payment requirements by leveraging the *Chonsei* deposit, strict LTV prudential limits have limited power to control the increasing debt dependency of households. At the same time, this ill-designed policy creates junctions that transfer risks that would normally be hedged in the financial market onto the space market where the *Chonsei* system operates, and hence we can presume that *Chonsei* tenants have been increasingly exposed to systemic risk. In order to
validate the demand-driven mechanism of mortgage lending within strict LTV limits, I will employ the user costs of housing approach in the next section.
4.3 Demand-driven Mortgage Lending within Strict LTV Limits

Strict LTV prudential limits can substantially mitigate the asymmetric information problem, and hence banks are willing to approve mortgage loans within strict LTV limits as long as borrowers are able to secure their down payments. That is, mortgage lending will occur within strict LTV limits if and only if the sum of a mortgage and a down payment is equal to the collateral value of a house.\(^{11}\)

Following this premise, let the collateral value of a house \((V)\) be decomposed by the capital structure

\[
V = M + E, \quad (4.1)
\]

where \(M\) is the mortgage, subject to a LTV prudential limit \((k)\),\(^{12}\) and \(E\) is the down payment, subject to the net worth of a landlord \((E_{\text{max}})\). In order to derive the optimal capital structure of landlords among borrowers, I employ the user costs of housing approach (see e.g. Brueckner, 2011).

\(^{11}\) This study primarily focuses on the lending behaviors of banks and, as a result, second mortgages are not considered in this model.

\(^{12}\) \(M \leq kV\) and \(M_{\text{max}} = kV\) \((0 \leq k < 1)\).
To capture revenues and costs of the investment, let \( r \) denote the property income rate, \( i_m \) denote the mortgage interest rate, \( i_s \) denote the savings interest rate, and \( g \) denote the rate of capital gains. With all these elements given, the annual revenue \((R)\) that consists of the property income and the capital gains and cost \((C)\) that consists of the mortgage payment and the opportunity cost of equity of a landlord can be written as

\[
R = rV + gV \tag{4.2}
\]

\[
C = i_m M + i_s E, \tag{4.3}
\]

and her profit function \((P)\) is given by

\[
P = R - C = (r + g - i_s)V - (i_m - i_s)M \quad \text{s.t.} \quad M \leq \frac{k}{1-k} E_{max}. \tag{4.4}
\]

Hence, as long as \( \frac{\partial P}{\partial M} \) is greater than 0, she will be willing to increase the loan amount until the point that \( M \) is equal to \( \frac{k}{1-k} E_{max} \) in order to maximize her profit.

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13 For simplicity, miscellaneous costs such as the property tax and the depreciation cost are omitted from this model.

14 The collateral value of a house cannot exceed a landlord's credit and equity constraints: \( V \leq E_{max} + M_{max} \). By replacing \( M_{max} \) with \( kV \), then we can derive constraints as \( V \leq \frac{E_{max}}{1-k} \) and \( M \leq \frac{k}{1-k} E_{max} \).

15 \( \frac{\partial P}{\partial M} = \frac{1}{k}(r + g - i_s) - i_m + i_s > 0 \). Since \( k < 1 \), we can simplify this inequality as \( \frac{\partial P}{\partial M} > r + g - i_m > 0 \). Intuitively, unless there is a significant increase in mortgage interest rates and/or substantial home price depreciation, we can presume that a landlord will be willing to increase the loan amount to maximize her profit.
Figure 7: The capital structure of a landlord who only leverages a mortgage

Notes: The triangle indicates the capital structure of a landlord who only leverages a mortgage.

In this manner, LTV regulation can effectively restrict the volume of mortgages since a mortgage is the only external source of capital while a landlord is willing to increase the loan amount in order to maximize her profit.
Figure 8: The impact of a lower LTV prudential limit on the capital structure of a landlord who only leverages a mortgage.

Notes: The triangle indicates the capital structure of a landlord who only leverages a mortgage.
Now we relax the credit constraints of a landlord by considering the role of *Chonsei* deposits, an additional external source of capital to finance homeownership: let $D$ denote the *Chonsei* deposit that is calculated with a *Chonsei*-to-Value (CTV) ratio ($c$).\textsuperscript{16} It is important to note that the maximum amount of regulated credit available to a landlord will be varied according to the debt structure as well as the macroprudential limits. This mainly stems from the LTV regulation that compels banks to include senior secured debt obligations, such as the *Chonsei* deposit, in the total loan amount to derive a market LTV ratio.\textsuperscript{17} Following this rule, when $D$ is senior debt and $M$ is junior debt, we can restate the capital structure of a landlord (4.1) as

\[
V = D + M + E \quad (c < k) \tag{4.5a}
\]

\[
V = D + E \quad (c \geq k), \tag{4.5b}
\]

and $M$ is subject to $k - c$. Otherwise, when $M$ is senior secured debt, the capital structure is

\[
V = M + D + E. \tag{4.6}
\]

\textsuperscript{16} $D = cV \ (0 \leq c < 1)$.

\textsuperscript{17} The rule for calculating the market LTV ratio: \textit{market LTV} = \left(\frac{\text{a mortgage debt + a senior secured debt}}{\text{the collateral value of a house}}\right) \ast 100.
Chonsei and monthly-rental are substitutes and hence it is no longer possible for a landlord to earn property income in the mode of Chonsei. Rather, she can earn investment income by utilizing the deposit. Suppose that the investment income rate is equal to the savings interest rate since a landlord typically puts the Chonsei deposit into her savings account during the rental period. The annual revenue, which consists of the investment income and the capital gains, and cost, which consists of the mortgage payment and the opportunity cost of equity, of a landlord who leverages both the Chonsei deposit and a mortgage can then be written as

\[ R = i_D D + gV \quad (4.7) \]
\[ C = i_m M + i_s E. \quad (4.8) \]

Thus, when \( D \) is senior secured debt, her profit function can be written as:

\[ P = (i_s(2c - 1) + g)V - (i_m - i_s)M \quad \text{s.t.} \quad M \leq \frac{k-c}{1-k} E_{\text{max}} \quad (c < k) \quad (4.9a) \]
\[ P = (i_s(2c - 1) + g)V \quad \text{s.t.} \quad D \leq \frac{c}{1-c} E_{\text{max}} \quad (c \geq k). \quad (4.9b) \]

---

\[ \text{If } c < k, \text{ then the capital structure can be written as } V \leq E_{\text{max}} + D + M_{\text{max}}. \text{ By replacing } M_{\text{max}} \text{ and } D \text{ with } (k - c)V \text{ and } cV \text{ representatively, we can derive constraints as } V \leq \frac{c}{1-c} E_{\text{max}} \text{ and } M \leq \frac{k-c}{1-k} E_{\text{max}}. \text{ Otherwise, } c \geq k, \text{ the capital structure can be written as } V \leq E_{\text{max}} + D. \text{ By replacing } D \text{ with } cV, \text{ we can derive constraints as } V \leq \frac{E_{\text{max}}}{1-c} \text{ and } D \leq \frac{c}{1-c} E_{\text{max}}. \]
Suppose that there is no negative yield gap between mortgage and savings interest rates. Given
the assumption, at the same $V$, the net income of landlord A, who only leverages the Chonsei
deposit due to $c \geq k$, is always greater than the net income of landlord B, who leverages both a
mortgage and the deposit due to $c < k$. This implies that a high CTV environment makes a
mortgage less favorable to finance homeownership for landlords. For instance, even if the
financial authority loosens the prudential limit $(k < k')$, a landlord will be less willing to
leverage a mortgage rather than the Chonsei deposit unless $k'$ exceeds $c$.

However, when $M$ is senior secured debt, we should address the problems of negative equity:
since $c$ and $k$ are exogenously determined, the sum of $c$ and $k$ can be greater than one. Thus,
I adopt different assumptions about the borrowing behaviors according to whether $c + k \leq 1$ or
not.\(^{19}\) On the one hand, when $M$ is senior secured debt and $c + k \leq 1$, a landlord will fully
leverage the mortgage in order to maximize her profit as long as $\frac{\partial p}{\partial M} > 0$. Given the assumption,
her profit function can be written as\(^{20}\)

\(^{19}\) Suppose that $k$ is fixed, then a low $c + k$ implies a low CTV environment and high $c + k$ implies a high CTV
environment.

\(^{20}\) If $c + k \leq 1$, then the capital structure can be written as $V \leq E_{max} + D + M_{max}$. By replacing $M_{max}$ and $D$ with
$kV$ and $cV$ representatively, we can derive constraints as $V \leq \frac{E_{max}}{1-(c+k)}$ and $M \leq \frac{k}{1-(c+k)} E_{max}$. 
Figure 9 The capital structure of a landlord who can leverage both a mortgage and the Chonsei deposit when the deposit is senior secured debt

Notes: The red triangle indicates the capital structure of a landlord who only leverages the deposit. The gray triangle indicates the capital structure of a landlord who leverages both a mortgage and the deposit.

\[
P = (i_s(2c - 1) + g)V - (i_m - i_s)M \quad \text{s.t.} \quad M \leq \frac{k}{1 - (c+k)}E_{\text{max}} \quad (c + k \leq 1). \quad (4.10)
\]
and she will be willing to increase the loan amount until the point that $M$ is equal to

$$
\frac{k}{1-(c+k)} F_{\text{max}} \text{ unless } \frac{\partial P}{\partial M} \leq 0. \text{ }^{21}
$$

Intuitively, in a low CTV environment, the LTV prudential regulation will effectively restrict the volume of mortgages since the higher (lower) LTV limit will relax (tighten) her credit constraints.

In the manner that $M$ is senior secured debt and $c+k > 1$, on the other hand, if a landlord fully leverages the regulated debt in advance when she is securing her tenant, then she will confront the high vacancy risk on account of the negative equity. To avoid this problem, suppose two available alternatives for a landlord.

[Alternative 1] A landlord can fully leverage a mortgage in advance when she is securing her tenant. However, in order to avoid negative equity, she should secure a monthly-rental tenant, instead of a Chonsei tenant.

[Alternative 2] A landlord may not fully leverage a mortgage in advance when she is securing a Chonsei tenant in order to avoid negative equity.

\[ \frac{\partial P}{\partial M} = \frac{1}{k} (i_e (2c - 1) + g) - i_m + i_s \leq 0. \text{ Since } c + k \leq 1, \text{ we can simplify this inequality as } \frac{\partial P}{\partial M} \leq \frac{1}{k} (g + ci_s - ki_m) \leq 0. \]

Intuitively, during the period of modest home price appreciation or depreciation in particular, the proportion of $c$ to $k$ is critical to determine the sign of $\frac{\partial P}{\partial M}$. 

\[ \text{ }^{21} \]
The profit function of a landlord who only leverages a mortgage (Alternative 1) is equal to \((4.4)\).

Otherwise, if she determines to secure a *Chonsei* tenant (Alternative 2), her credit constraint is subject to \(c\), \(k\) and \(E_{max}\). To derive her credit and equity constraints, let \(k^*\) denote the actual LTV ratio,\(^{22}\) subject to \(k^* \leq k\) and \(1 - \frac{E_{max}}{V} \leq c + k^* \leq 1\). Hence, her profit function can be written as\(^{23}\)

\[
P_1 = (r + g - i_s)V - (i_m - i_s)M \quad \text{s.t.} \quad M \leq \frac{k}{1-k}E_{max} \quad \text{[Alternative 1]} \quad (4.11a)
\]

\[
P_2 = (i_s(2c - 1) + g)V - (i_m - i_s)M \quad \text{s.t.} \quad M \leq \frac{k^*}{1-(c+k^*)}E_{max} \quad \text{[Alternative 2]} \quad (4.11b)
\]

In terms of a tenant, his tenure choice between *Chonsei* and monthly-rental should be indifferent at the same \(V\) and hence his monthly rental payment \((rV)\) should be equal to his opportunity cost of the leveraged *Chonsei* deposit \(((i_s + i_m)D)\).\(^{24}\) Then, (4.11a) can be restated as

\[
P_1 = ((i_s + i_m)c + g - i_s)V - (i_m - i_s)M \quad \text{s.t.} \quad M \leq \frac{k}{1-k}E_{max}, \quad (4.12)
\]

\(^{22}\) \(M = k^*V\).

\(^{23}\) Since \(V - E_{max} - D \leq M\), by replacing \(M\) and \(D\) with \(k^*V\) and \(cV\) representatively, we can derive constraints as \(V \leq \frac{E_{max}}{1-(c+k^*)}\) and \(M \leq \frac{k^*}{1-(c+k^*)}E_{max}\).

\(^{24}\) I assume the net worth of a tenant is equal to 0 \((E_{max} = 0)\).
and $P_2 - P_1$ is given by

$$P_2 - P_1 = \frac{1}{k^*}((2i_s c + g - i_s)M_2 - \frac{1}{k^*}(((i_s + i_m)c + g - i_s)M_1 - (M_2 - M_1)(i_m - i_s)).$$  \quad (4.13)$$

Hence, at the same $V$, as long as the actual LTV ratio ($k^*$) is low enough (namely, the CTV is high enough),\(^{25}\) Alternative 2 can always be superior to Alternative 1. Due to this property, in a high CTV environment, it can be less favorable to fully leverage regulated credit in order to finance homeownership.

To sum up, strict LTV prudential limits that interact with a market peculiarity, the Chonsei system, have created the demand-driven mechanism of mortgage lending. Above all, strict LTV limits make the problem of asymmetric information less critical to banks and, as a result, they can be less restrained about their mortgage approvals as long as borrowers succeed in securing down payments. At the same time, since the Chonsei deposit can work as a superior substitute for a mortgage as well as equity, a landlord can easily mitigate her credit constraints by leveraging this unregulated credit, especially in a high CTV environment. As a result, strict LTV limits that restrict mortgage borrowing by requiring a certain amount of down payment have

\(^{25}\) $k^* < k \frac{2i_s}{i_s + i_m}$
limited power to control the volume of mortgage loans. In addition, since strict LTV limits do strongly compel the institutional debt to be senior secured, their Chonsei tenants tend to be exposed to default risk before banks are exposed to the same risk. Under high CTV environments, consequently, strict LTV regulation cannot be an effective means to stabilize the space market, although it may still be effective to mitigate financial market instability by transferring risks that would normally be hedged in the financial market onto the space market.

**Figure 10** The capital structure of a landlord who can leverage both a mortgage and the Chonsei deposit when the mortgage is senior secured debt

Notes: The red triangle indicates the capital structure of the Alternative 2. The gray triangle indicates the capital structure of the Alternative 1.
4.4 **Empirical Model and Results**

4.4.1 **Data**

This study employs quarterly time series data from the first quarter of 2008 to the fourth quarter of 2014. Spatially, the data cover seven metropolitan cities in Korea. Importantly, in the City of Seoul, the LTV and DTI prudential limits have been differentiated at the municipal district level during the sample period. Hence, in order to capture these differentiated policy interventions precisely, this study constructs a panel dataset by including 25 municipal districts in the City of Seoul and the other metropolitan cities. Since the City of Seoul has always been the largest housing market in Korea, there has not been a substantial gap between each sub-panel’s average volume of outstanding residential mortgages.

Macroeconomic indicators such as real Gross Domestic Product ($Y$) and real mortgage rate ($i$) are extracted from the Bank of Korea. There are no substantial spatial barriers to purchase residential properties across the areas and hence these national-level data are commonly applied over the study areas. Real residential property prices index ($P$) and the Chonsei-to-Value ratios ($CTV$) are respectively provided by the KB Kookmin Bank and the Real Estate 114 – the

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26 Seoul, Incheon, Busan, Daegu, Gwangju, Daejeon and Ulsan are the seven metropolitan cities in Korea.
major private providers of residential market information in Korea. I adopt these appraisal-based indicators primarily because lenders typically rely on the appraised values of collaterals to make their lending decisions. Real residential mortgages outstanding \((L)\) and the market LTV ratios \((LTV)\) are derived from the quarterly reports of commercial banks since this study primarily focuses on the lending behaviors of banks rather than other types of financial institutions. Finally, LTV \((p_{LTV})\) and DTI \((p_{DTI})\) intervention variables are dummy variables that take on the value of 1 for the tightening periods of the regulation. The Financial Supervisory Service has provided overall information about the changes in regulatory environments.

The real residential mortgages outstanding, the real gross domestic product and the real residential property prices are derived by dividing nominal values by the consumer price index with the first quarter of 2008 as the base. All these variables are seasonally adjusted using the X-13 procedure. Furthermore, natural logs of the real residential mortgages outstanding, the real gross domestic product and the real residential property prices that are set to 100.0 in the first quarter of 2008 are used in the analysis. Otherwise, the real mortgage rate is derived by subtracting the change in GDP deflator from the nominal value. The real mortgage rate, the LTV ratios and the Chonsei-to-Value ratios are written in decimal notation.
4.4.2 **Empirical Model**

This study employs a panel instrumental variables approach to validate the stylized mortgage lending behaviors in Korea. Above all, following previous studies that analyze the relations between credit and real property markets (see e.g. Gimeno and Martinez-Carrascal, 2010), let residential mortgages outstanding ($L$) be a function of gross domestic product ($Y$) as a measure of aggregate economic activity, interest rate ($i$) as a proxy for mortgage affordability, and residential property price ($P$) that can affect bank lending behaviors as well as credit demand.

$$\log(L_{it}) = f(\log(P_{it}), \log(Y_t), i_t) + e_{it}$$  \hspace{1cm} (4.14)
One potential challenge in this ordinary least squares equation is that the high significance of GDP, interest rate and property prices in the equation for credit outstanding can be spurious due to non-stationarity of the time series data. According to the Augmented Dickey-Fuller (ADF) unit root tests, the null hypothesis of a unit root in the levels cannot be rejected for the majority of the series at a significance level of 0.1. These results imply that credit outstanding, property prices, and GDP are non-stationary in levels. As for the first differences, on the other hand, the null is mainly rejected. It is important to note, however, that differencing the series can lead to overlooking possible long-run relationships between the levels. That is, as long as there is a long-run cointegrating relationship for mortgages outstanding, it is still worthwhile to examine the co-movements of the non-stationary levels in their original metrics.

To identify the long-run relationships, the Johansen approach for testing multivariate cointegration is adopted (see e.g. Johansen, 1995). At a significance level of 0.05, the results of the trace test suggest that there is at least a single cointegrating relationship between the log of real mortgages outstanding, real residential property price and real GDP in each sub-panel, except for Yongsan-gu, Guro-gu and Incheon. The cointegration test results also include the

27 I also performed diagnostic tests – Breusch-Godfrey Lagrange Multiplier (LM) test for autocorrelation, Jarque-Bera test for normality, and White heteroscedasticity test for individual equations. Overall, the tests do not reject the null hypothesis of cointegration.
### TABLE III
AUGMENTED DICKEY-FULLER (ADF) UNIT ROOT TEST RESULTS

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<td>Real mortgage rate (I)</td>
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<td>Real mortgages outstanding (L) in log</td>
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<td>Real residential property price (P) in log</td>
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<td><strong>Panel for all areas</strong></td>
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<td>Panel 1. Jongno-gu</td>
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<td>Panel 5. Gwangjin-gu</td>
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**6 Metropolitan cities**

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<td>Panel 30. Daejeon</td>
<td>-2.22 (T)</td>
<td>-1.89 (C)</td>
<td>-2.71 (T)</td>
<td>-2.83 (C)*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Panel 31. Ulsan</td>
<td>-0.36 (T)</td>
<td>-2.46 (C)</td>
<td>-3.07 (T)</td>
<td>-2.19 (C)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes: The table reports ADF test statistics for the null hypothesis of a unit root. T, C and N indicate whether the test regression includes a time trend or a constant – both a time trend and a constant (T), only a constant (C), or neither a trend nor a constant (N). The specification of these deterministic terms relies on the trend of each variable for the sample period as well as typical practice in time series studies. The lag orders are determined by the Newey–West bandwidth selection method for kernel based estimators. The symbols ***, ** and * indicate significance at 1%, 5% and 10% levels.
cointegrating coefficients ($\beta$) that indicate the relationship between the endogenous variables and the loading factors ($\alpha$) that describe the dynamic adjustment of the variables to the long run equilibrium. Most variables show the expected signs for the cointegrating equation: the increase in mortgages outstanding is positively related to the increase in house price as well as the increase in GDP. Note that most feedback parameters ($\alpha$) are also substantial and highly significant. Based upon these findings, I will continue to examine the stylized mortgage lending behaviors within the original equation (4.14).

Since there have been two major policy interventions on bank lending, the LTV ($p_{LTV}$) and DTI ($p_{DTI}$) regulations, I restate the function (4.14) as

$$\log(L_{it}) = f(\log(P_{it}), \log(Y_t), i_t, p_{LTV_{it}}, p_{DTI_{it}}) + e_{it}. \quad (4.15)$$

However, according to the lending and borrowing behaviors depicted above, the strict LTV prudential limits have had limited power to control bank lending. Thus, this inaccurate measure ($p_{LTV}$) can be replaced with the market Loan-to-Value ratio ($LTV$) that significantly depends on the $Chonsei$-to-Value ratio ($CTV$), a proxy for the accessibility of the unregulated credit to finance homeownership.
### TABLE IV
COINTEGRATION TEST RESULTS

<table>
<thead>
<tr>
<th>Panel</th>
<th>Metropolitan cities</th>
<th>β: Cointegrating coefficients</th>
<th>α: Loading factors</th>
<th>Trace test</th>
<th>T=0</th>
<th>T=5</th>
<th>T=10</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>log(L)</td>
<td>log(P)</td>
<td>log(Y)</td>
<td>Δlog(L)</td>
<td>Δlog(P)</td>
<td>Δlog(Y)</td>
<td></td>
</tr>
<tr>
<td>Seoul</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Panel 1.</td>
<td>Jongno-gu</td>
<td>1.00</td>
<td>-2.11***</td>
<td>-1.70***</td>
<td>0.03</td>
<td>(0.19)</td>
<td>0.12</td>
</tr>
<tr>
<td>Panel 2.</td>
<td>Jung-gu</td>
<td>1.00</td>
<td>0.89***</td>
<td>-2.61***</td>
<td>-0.60</td>
<td>(0.74)</td>
<td>-0.07</td>
</tr>
<tr>
<td>Panel 3.</td>
<td>Yongan-gu</td>
<td>1.00</td>
<td>-2.38***</td>
<td>-3.44***</td>
<td>-0.05</td>
<td>(0.10)</td>
<td>0.04</td>
</tr>
<tr>
<td>Panel 4.</td>
<td>Seongdong-gu</td>
<td>1.00</td>
<td>-0.41</td>
<td>-2.02***</td>
<td>-0.32</td>
<td>(0.13)**</td>
<td>-0.02</td>
</tr>
<tr>
<td>Panel 5.</td>
<td>Gwangjin-gu</td>
<td>1.00</td>
<td>-1.23***</td>
<td>-0.67***</td>
<td>-0.20</td>
<td>(0.10)*</td>
<td>0.00</td>
</tr>
<tr>
<td>Panel 6.</td>
<td>Donglaemun-gu</td>
<td>1.00</td>
<td>-0.60***</td>
<td>-1.50***</td>
<td>-0.55</td>
<td>(0.26)**</td>
<td>0.06</td>
</tr>
<tr>
<td>Panel 7.</td>
<td>Jangnang-gu</td>
<td>1.00</td>
<td>5.70***</td>
<td>3.49***</td>
<td>0.05</td>
<td>(0.05)</td>
<td>-0.13</td>
</tr>
<tr>
<td>Panel 8.</td>
<td>Seongbuk-gu</td>
<td>1.00</td>
<td>-12.25***</td>
<td>-12.62***</td>
<td>-0.07</td>
<td>(0.03) **</td>
<td>0.03</td>
</tr>
<tr>
<td>Panel 9.</td>
<td>Gangbuk-gu</td>
<td>1.00</td>
<td>-0.59***</td>
<td>-1.90***</td>
<td>0.24</td>
<td>(0.31)</td>
<td>0.23</td>
</tr>
<tr>
<td>Panel 10.</td>
<td>Dobong-gu</td>
<td>1.00</td>
<td>-1.05***</td>
<td>-1.48***</td>
<td>0.20</td>
<td>(0.14)</td>
<td>0.23</td>
</tr>
<tr>
<td>Panel 11.</td>
<td>Nowon-gu</td>
<td>1.00</td>
<td>-1.23***</td>
<td>-1.44***</td>
<td>-0.09</td>
<td>(0.10)</td>
<td>0.33</td>
</tr>
<tr>
<td>Panel 12.</td>
<td>Eunpyeong-gu</td>
<td>1.00</td>
<td>-8.08***</td>
<td>-12.18***</td>
<td>-0.16</td>
<td>(0.03)***</td>
<td>0.00</td>
</tr>
<tr>
<td>Panel 13.</td>
<td>Seodaemun-gu</td>
<td>1.00</td>
<td>-0.04</td>
<td>-1.55***</td>
<td>-0.15</td>
<td>(0.16)</td>
<td>0.03</td>
</tr>
<tr>
<td>Panel 14.</td>
<td>Mapo-gu</td>
<td>1.00</td>
<td>-1.63***</td>
<td>-2.32***</td>
<td>0.09</td>
<td>(0.06)</td>
<td>0.07</td>
</tr>
<tr>
<td>Panel 15.</td>
<td>Yangcheon-gu</td>
<td>1.00</td>
<td>-0.39***</td>
<td>0.85***</td>
<td>-2.04</td>
<td>(0.75)***</td>
<td>0.75</td>
</tr>
<tr>
<td>Panel 16.</td>
<td>Gangseo-gu</td>
<td>1.00</td>
<td>-1.22***</td>
<td>-1.44***</td>
<td>0.09</td>
<td>(0.06)</td>
<td>0.07</td>
</tr>
<tr>
<td>Panel 17.</td>
<td>Gwanak-gu</td>
<td>1.00</td>
<td>-7.47***</td>
<td>-9.17***</td>
<td>-0.01</td>
<td>(0.04)</td>
<td>0.03</td>
</tr>
<tr>
<td>Panel 18.</td>
<td>Gwangju</td>
<td>1.00</td>
<td>-4.55***</td>
<td>-2.80***</td>
<td>0.05</td>
<td>(0.03)***</td>
<td>0.06</td>
</tr>
<tr>
<td>Panel 19.</td>
<td>Gwanak-gu</td>
<td>1.00</td>
<td>-3.83***</td>
<td>-2.63***</td>
<td>0.11</td>
<td>(0.04)***</td>
<td>0.09</td>
</tr>
<tr>
<td>Panel 20.</td>
<td>Gangdong-gu</td>
<td>1.00</td>
<td>-1.04</td>
<td>0.01</td>
<td>-0.63</td>
<td>(0.18)***</td>
<td>0.23</td>
</tr>
</tbody>
</table>

**Notes:** To specify Vector Auto Regression (VAR) models, Akaike’s information criterion (AIC), Schwarz’s Bayesian information criterion (SBIC), and the Hannan and Quinn information criterion (HQIC) are utilized. The symbols ***, ** and * indicate significance at 1%, 5% and 10% levels. Standard errors of loading factors are in parenthesis.
\[ LTV_{it} = h(CTV_{it}) + \epsilon_{it}. \] (4.16)

It is important to note that the required amount of a Chonsei deposit that is derived by the interaction of supply and demand for Chonsei rental housing can be independent from the value of the house that is determined in the capital market. That is, the CTV ratio is determined in the property market for space use, not in the capital market. Thus, by replacing \( p_{LTV} \) with the fitted value of \( LTV \) derived from the value of \( CTV \), I address the problem of endogeneity that can occur through directly inserting \( LTV \) into (4.15).

Consequently, I build a bank lending model, where the market LTV is a function of CTV; and bank mortgage lending is a function of fitted market LTV, gross domestic product, interest rate, residential property price, and the DTI intervention variable

\[
\log(L_{it}) = \theta_0 + \theta_1 \log(P_{it}) + \theta_2 \log(Y_{it}) + \theta_3 i_t + \theta_4 p_{DTI}l_{it} + \theta_5 LTV_{it} + \epsilon_{it}; \] (4.17)

\[ LTV_{it} = \delta_0 + \delta_1 CTV_{it} + \delta_2 CTV^2_{it} + \epsilon_{it}. \] (4.18)

In a low CTV environment, an institutional mortgage can work as an irreplaceable external source of capital to finance homeownership. However, a high CTV environment makes this...
regulated credit less favorable for leveraging. Hence, in the first stage regression (4.18), I expect $\delta_1$ to be positive and $\delta_2$ to be negative. In the second stage regression (4.17), $P$, $Y$ and the fitted $LTV$ are anticipated to affect outstanding mortgages positively and hence I anticipate $\theta_1$, $\theta_3$ and $\theta_5$ being positive. Otherwise, since an increase in the mortgage rate and the DTI regulation can limit access to the regulated credit, I expect $\theta_2$ and $\theta_4$ to be negative.

### 4.4.3 Results

As expected, the estimates in the first stage regression (4.18) imply the positive relationship between the market LTV ratio and the CTV ratio in a low CTV environment and the negative relationship between them in a high CTV environment. Those are

\[
LTV_{it} = 0.29 \times 0.41 + 0.14 \times CTV_{it} \times CTV_{it}^2, \quad \text{Adj } R^2 = 0.471
\]

where the symbols (***) and (*) indicate the significance at 1% and 10% levels. This result also suggests the role of Chonsei as the preferred substitute of the regulated credit, even though the institutional mortgage market has rapidly expanded in Korea since the integration with financial globalization.
TABLE V displays the final estimates of the second stage regression. A Hausman test is performed for model specification: the null hypothesis of the consistency of the random effects (RE) model can be rejected with a p-value of 0.00, while comparing the RE and fixed effects for location (FEL) models as well as the RE and fixed effects for time and location (FETL) models. These results can be anticipated primarily because the study areas are not randomly selected. Otherwise, except for the estimates of log(Y), we can observe that the coefficients, the significance and the overall fits of the FEL and FETL models are almost identical. These results may stem from the original series that are seasonally adjusted. Hence, I adopt the FEL model as the baseline model.

Unlike the elasticity of outstanding residential mortgages which is almost unit elastic with respect to GDP, a one percent increase in residential property price is associated with about a two percent increase in outstanding mortgages. This implies that bank lending can be more sensitive to real property market cycles rather than overall economic conditions. Meanwhile, a rise of one percentage point of the fitted market LTV results in about 6.21 percent increase in the mortgage outstanding; on the other hand, a rise of one percentage point of the mortgage rate leads to about 1.94 percent decrease in the volume of mortgage loans.
### TABLE V
SUMMARY ESTIMATES ACCORDING TO THE MODEL SPECIFICATIONS

<table>
<thead>
<tr>
<th></th>
<th>Random effects</th>
<th>Location fixed effects</th>
<th>Time and location fixed effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>log(P)</td>
<td>0.92***</td>
<td>2.15***</td>
<td>2.24***</td>
</tr>
<tr>
<td></td>
<td>(0.12)</td>
<td>(0.17)</td>
<td>(0.25)</td>
</tr>
<tr>
<td>log(Y)</td>
<td>1.46***</td>
<td>0.98***</td>
<td>0.52</td>
</tr>
<tr>
<td></td>
<td>(0.08)</td>
<td>(0.09)</td>
<td>(0.39)</td>
</tr>
<tr>
<td>i</td>
<td>-1.18***</td>
<td>-1.94***</td>
<td>-1.94***</td>
</tr>
<tr>
<td></td>
<td>(0.40)</td>
<td>(0.42)</td>
<td>(0.46)</td>
</tr>
<tr>
<td>$p_{DTI}$</td>
<td>0.01</td>
<td>-0.08***</td>
<td>-0.08**</td>
</tr>
<tr>
<td></td>
<td>(0.02)</td>
<td>(0.02)</td>
<td>(0.03)</td>
</tr>
<tr>
<td>$LITV$</td>
<td>0.97***</td>
<td>6.21***</td>
<td>6.54***</td>
</tr>
<tr>
<td></td>
<td>(0.50)</td>
<td>(0.69)</td>
<td>(1.08)</td>
</tr>
<tr>
<td>Constant</td>
<td>-6.74***</td>
<td>-12.46***</td>
<td>-10.88***</td>
</tr>
<tr>
<td></td>
<td>(0.63)</td>
<td>(0.88)</td>
<td>(3.10)</td>
</tr>
<tr>
<td>Location-fixed effects</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Time-fixed effects</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.376</td>
<td>0.353</td>
<td>0.352</td>
</tr>
</tbody>
</table>

Notes: The symbols ***, ** and * indicate significance at 1%, 5% and 10% levels. Standard errors are in parenthesis.

4.4.4 Geographic Disaggregation

Finally, this study presents the results of robustness checks on the empirical model based upon geographic disaggregation. During the sample period, the Seoul Metropolitan Area (SMA), which includes Seoul and Incheon, and the non-SMA, which includes the other five cities, have
shown distinct features. First, the average level of absolute house prices in the SMA is much higher than that in the non-SMA. Second, unlike in the SMA, the DTI regulation has never been applied in the non-SMA. Finally, in real terms, there has been consistent house price depreciation in Seoul and Incheon, while there has been significant house price appreciation in all cities in the non-SMA. Hence, in order to address potential issues that may stem from these distinct features, this study also conducts FEL regressions with two sub-panels, SMA and non-SMA.

Despite the distinct properties, overall, the results show strong consistency – in particular, the impacts of the fitted LTVs on bank mortgage lending persist across the areas. Otherwise, we can also observe substantial disparities in the estimates of some regressors, such as GDP and mortgage rate, between the SMA and the non-SMA. These may mainly result from a disparity in average house prices between the SMA and the non-SMA. For instance, since residential property prices in the non-SMA are much lower, the impacts of a change in overall economic conditions can be more substantial in the non-SMA. Interestingly, compared to the SMA, the outstanding mortgages in the non-SMA seem to be more responsive to a change in mortgage

---

28 The Seoul Metropolitan Area is one of the largest metropolitan areas in the world: it has over half of the population of the Korea, Republic of. The SMA has been home to the most affluent and livable cities in Korea due to its locational advantages and economies of agglomeration.
rate, although we can expect a lower mortgage payment that is pegged to the lower home value in that area. This result implies that regulated credit is less indispensable to finance homeownership in the non-SMA: considering the level of absolute house prices in the SMA, a mortgage loan can be an irreplaceable external source of capital to finance homeownership; on the other hand, a potential borrower in the non-SMA can be more sensitive to a change in the mortgage rate because it is relatively easier to purchase real property without the help of regulated credit. The fact that the overall level of CTVs in the non-SMA has been high over time can also support this presumption. Consequently, we can acknowledge that the relationship between regulated and unregulated credit has shaped the unique mortgage lending behaviors in both the SMA and the non-SMA.
<table>
<thead>
<tr>
<th></th>
<th>7 metropolitan cities</th>
<th>SMA</th>
<th>Non-SMA</th>
</tr>
</thead>
<tbody>
<tr>
<td>log($P$)</td>
<td>2.15***</td>
<td>1.87***</td>
<td>1.42***</td>
</tr>
<tr>
<td></td>
<td>(0.17)</td>
<td>(0.24)</td>
<td>(0.27)</td>
</tr>
<tr>
<td>log($Y$)</td>
<td>0.98***</td>
<td>0.88***</td>
<td>2.00***</td>
</tr>
<tr>
<td></td>
<td>(0.09)</td>
<td>(0.15)</td>
<td>(0.23)</td>
</tr>
<tr>
<td>$i$</td>
<td>-1.94***</td>
<td>-1.39***</td>
<td>-2.18**</td>
</tr>
<tr>
<td></td>
<td>(0.42)</td>
<td>(0.44)</td>
<td>(1.09)</td>
</tr>
<tr>
<td>$p_{DTI}$</td>
<td>-0.08***</td>
<td>-0.08***</td>
<td>(omitted)</td>
</tr>
<tr>
<td></td>
<td>(0.02)</td>
<td>(0.02)</td>
<td></td>
</tr>
<tr>
<td>$LTV$</td>
<td>6.21***</td>
<td>5.40***</td>
<td>5.62***</td>
</tr>
<tr>
<td></td>
<td>(0.69)</td>
<td>(0.59)</td>
<td>(1.28)</td>
</tr>
<tr>
<td>Constant</td>
<td>-12.46***</td>
<td>-10.28***</td>
<td>-13.99***</td>
</tr>
<tr>
<td></td>
<td>(0.88)</td>
<td>(1.73)</td>
<td>(1.68)</td>
</tr>
</tbody>
</table>

| Location-fixed effects | Yes | Yes | Yes |
| Time-fixed effects     | No  | No  | No  |
| $R^2$                  | 0.353 | 0.360 | 0.484 |

Notes: The symbols ***, ** and * indicate significance at 1%, 5% and 10% levels. Standard errors are in parenthesis.
4.5 **Conclusion and Policy Implications**

The main implications of this analysis are threefold. First, this study conceptualizes unique lending behaviors within strict LTV limits at the microfoundational level. This effort explicitly establishes the distinct roles of *Chonsei* on institutional mortgage lending that were mostly overlooked in previous macro studies.

Second, the empirical evidence in this study suggests that LTV limits have limited power to control the increasing debt dependency of households in Korea. In particular, the fitted values of LTV derived from the values of CTV are highly significant in determining mortgage loan volumes across the models. These results confirm mortgage lending decisions can be a demand-driven mechanism rather than a supply-driven mechanism within strict LTV limits, as long as households relax their down payment requirements by accessing the unregulated credit.

Third, there have been common beliefs that strict LTV limits have been successful interventions that achieve financial market stability in Korea. Upon closer examination, however, rather than stabilizing the space market as intended, LTV prudential limits have led to the transfer of risks that would normally be hedged in the financial market into the space market where the *Chonsei*
system operates. As a result, perceived financial market stability may have been achieved by increasing space market instability. In particular, for the past few years, the CTV ratio has consistently increased throughout the country and hence we can presume that Chonsei tenants, rather than intermediaries, have been increasingly exposed to systemic risk.

In conclusion, a LTV prudential regulation is ostensibly a defense mechanism that can prevent the transfer of risks from the space market into the financial market. Ironically, however, this ill-designed policy has stabilized the financial market by transferring risks in the financial market onto the space market in Korea.
4.6 **Cited Literature**


4.7 Cited Literature in Korean


5. A MICRO STUDY: HOUSEHOLDS’ REAL ESTATE PORTFOLIO UNDER THE RESTRUCTURING OF HOUSING FINANCE SYSTEM

5.1 Introduction

This study examines how households have more difficulty maintaining real estate ownership as their dependency on institutional debt has increased. Previous studies on the impact of credit constraints on homeownership have mainly focused on deriving the implications for modelling household savings, consumption decisions, and tenure and portfolio choice. Rather, this study addresses the structural relations between households’ dependency on institutional debt and wealth accumulation.

This study particularly focuses on examining the degree to which households’ vulnerability to risk and uncertainty can be differentiated according to the capital structure of their real estate ownership. Unlike the Chonsei system that is an indigenous, informal housing finance system, which requires infrequent debt payments, institutional mortgages require periodic debt payments, which compel households that leverage mortgages to be exposed to risk and uncertainty more often. That is, risk and uncertainty are less likely to be realized while households leverage the Chonsei deposit rather than institutional debts.
The increasing dependency on institutional debt not only causes households to have more difficulty building wealth, but also fundamentally alters their resilience against economic and social insecurity. It is important to acknowledge that real estate ownership has become a popular option for many of them to cope with increasing economic and social incertitude that have consistently been exacerbated under the drastic market reforms in recent decades. Hence, temporal risk and uncertainty are highly likely to be transferred into chronic or permanent household economic insecurity, as the institutional debt dependency exerts pressure on households to forgo their real estate ownership.

In order to examine the relationship between households’ capital structure and their serial tenure and portfolio choice, this study employs a multinomial logit regression approach on the basis of annual panel data drawn from the Korean Labor and Income Panel Study (KLIPS). The empirical results indicate households whose debt structure only consists of the Chonsei deposit have higher probabilities of maintaining their real estate ownership despite the impact of risk and uncertainty such as employment and health insecurity and property price depreciation.
These results rebut the common belief that market reform that accompanies new products and services, lower interest rates, and greater liquidity substantially motivates households to purchase real estate. Rather, increasing institutional debt dependency has significantly made households more vulnerable to risk and uncertainty and subsequently experience barriers to building wealth.
5.2 **Restructuring of the Korean Housing Finance System**

The “real estate myth,” the notion that real estate prices always go up, has been so popular in Korea. The strong upward tendency of real estate prices had maintained itself over the second half of the 20th century (Hannah et al., 1993; Kim and Suh, 1993), and hence to invest in real estate had been considered to be the most effective means to accumulate wealth. This conventional wisdom, however, has fundamentally been challenged by the emerging dissonance between the formal and informal housing finance systems in recent decades. In order to shed light on the mechanics of how this structural dissonance eventually comes down to a matter of household wealth accumulation, it is important to understand the unique development path of the Korean housing finance system.

Over the past century, in Korea there had consistently been a systematic and institutional financial development. Despite the evident development of the financial market, however, strong demand for non-institutional and informal housing capital had persisted. During the first half of the 20th century, Colonial Capitalism focused primarily on promoting Japan’s imperialistic expansion and supporting its war effort (Cho, 1989; Cole and Park, 1983). The following financial regime that is referred to as State Capitalism aimed at allocating financial
and non-financial resources to conglomerates, the Chaebols, and their businesses in order to support export-driven industrialization (Chang et al., 1998; Kim and Cho, 1999). Given these circumstances, the Chonsei system alternatively and effectively promoted households’ homeownership and wealth accumulation.

Chonsei is one of the indigenous practices in the Korean space market. It can be best understood as a two-year lease agreement in which the tenant pays an up-front deposit, typically about 40 percent to 80 percent of the value of the property, without a requirement for periodic rent payments. At the end of the rental term, the tenant can move out upon receipt of the same amount of deposit or renew the contract with the current landlord based upon the new market value of the property.

Even though Chonsei refers to a type of lease agreement or tenure mode, it should be understood in the context of wealth accumulation or the method of financing real property ownership. When a landlord leverages the sufficient Chonsei deposit, she does not have to depend on institutional mortgage loans and/or her equity for down payments as long as the deposit contributes a sizable proportion of the property value (Ambrose and Kim, 2003; Lee et
al., 2002). Consequently, the *Chonsei* system can have been positioned as the distinct mode of regulation in Korea, as this quasi-rental arrangement has worked as non-institutional, unregulated and informal housing capital over time.

This unique housing finance system faced a major turning point in the wake of the Asian Financial Crisis of 1997. Since the crisis struck the Korean economy, it immediately embraced the new global financial order due to the wide-ranging interventions of the International Monetary Fund (IMF) (Chang et al., 1998; Stiglitz, 2002). As a result, over the past couple of decades, there have been radical and far-reaching financial liberalization and integration.

These drastic reforms, however, have not only been located within the financial market. Rather, the extensive interventions led by the IMF have fundamentally restructured the whole socio-economic system. Notably, more than any other types of intervention, the structural reforms of the labor market have played a decisive role to reconstitute the relationship between economic and social insecurity. Despite the under-developed social security system, prior to the regime shift, the practice of “life-time employment” had protected the workforce from risk and uncertainty as it had substantially altered the role of a social safety net (Kim and Park, 2006).
The drastic labor market reforms, however, directly broke a weak linkage between economic and social security that had bolstered the quasi-social protection (Chang, 1998; Koo, 2000). As employees no longer expect such quasi-social protection, emerging economic insecurity eventually leads to growing social insecurity in the new era.

These structural shifts have paradoxically promoted wealth accumulation through real estate ownership despite reductions in demand for space led by demographic trends such as low fertility and rapid aging. This implies that real estate ownership is a functionally unneeded but financially necessary option for many households to cope with increasing economic and social insecurity under this finance-led growth regime. That is, in recent decades households who are either losing opportunities to become real estate owners or losing their ownership will structurally be more vulnerable to risk and uncertainty.

The banking and financial sector has exactly seized this opportunity. Since the 1997 Asian Financial Crisis, there has been a remarkable debt shift from corporate to consumer holdings – in particular, the explosive growth in residential mortgage lending (Kang and Kim, 2010; Park et al., 2010). Interestingly, contrary to the common belief that market reform that accompanies
financial innovation and greater access to credit motivates households to become homeowners, such radical debt shift does not seem to have effectively promoted homeownership. My premise is that the possible positive effects of those market reforms have substantially been offset by the shrinkage of non-institutional, unregulated and informal housing finance system – the *Chonsei* system.

This study focuses on examining how households have more difficulty maintaining real estate ownership in recent decades, as the extensive market reforms have reconstructed their resilience against economic and social insecurity. In particular, by challenging the role of the informal housing capital, the restructuring of the Korean housing finance system not only reestablishes households’ credit constraints to finance homeownership, but also exacerbates households’ vulnerability to risk and uncertainty. This study investigates the reconstitution of housing capital and its impact on wealth accumulation by shedding new light on the relationship between credit constraints and serial tenure and portfolio choice.
5.3 Serial Tenure and Portfolio Choice and Credit Constraints

Many studies on the impact of credit constraints on homeownership have mainly focused on deriving the implications for modelling household savings, consumption decisions, and tenure and portfolio choice. Rather, this study addresses the structural relations between households’ dependency on institutional debt that is a by-product of the restructuring of housing finance system and wealth accumulation. To elucidate the mechanics of how the reconstitution of housing capital eventually comes down to a matter of wealth inequality, it is first necessary to understand the relationship between tenure and portfolio choice and wealth accumulation.

What types of housing units do households desire? Why and how do households buy or sell such units? The utility of the consumption and/or investment spending on housing cannot be directly observed, and hence scholars have restored to various models that infer the utility of housing expenditures from observed housing tenure and portfolio choice. For instance, a life-cycle model is a classical framework that assumes tenure choice or portfolio allocation will reveal a specific pattern as a household ages (DiPasquale and Wheaton, 1996). This model particularly postulates a “hump-shaped” pattern of asset accumulation of households, which implies that households typically build assets during working years and liquidate those assets during retirement years.
This life-cycle model, however, has faced three central criticisms. First, owner-occupied housing consumption does not often follow this hump-shaped pattern since it directly provides irrereplaceable utility: habitation (Poterba and Samwick, 1997; Yang, 2009). This criticism implies the necessity to disentangle a preference toward owner-occupied housing from a preference toward housing investment. Second, its simple characterization of income growth and behavior change with age barely reflects economic incertitude over the life-cycle (Gourinchas and Parker, 2002). Third, unlike its static assumption, the willingness to pay for housing services will not be uniform across households. For example, wealthier households are thought to consume more local amenities (Brueckner et al., 1999), and hence this will lead to an income elasticity of home value greater than unity (Kurban et al., 2015). In summary, these critics commonly suggest that heterogeneity across households needs to be deliberately addressed in order to clarify economic drivers that determine the level of housing expenditures by households.

Previous analyses of tenure decisions have identified and elaborated on the importance of three economic variables: the relative costs of owning versus renting (Brueckner, 2011; Mills, 1990; Rosen, 1985), lifetime earnings and the associated borrowing constraint (Duca and Rosenthal, 1994; Haurin et al., 1996b; Linneman and Wachter, 1989; Zorn, 1989), and current wealth and
the associated down payment constraint (Brueckner, 1986; Haurin et al., 1995; 1996a; Jones, 1989). Specifically, as institutional mortgage markets have become more complex and sophisticated, studies on credit constraints and tenure decision have gained more prominence (see e.g. Calem et al., 2010; Campbell and Cocco, 2003; Chambers et al., 2009; Fortowsky et al., 2011).

Meanwhile, models of portfolio decisions have put more emphasis on risk and uncertainty that influence the expected value of asset returns and, eventually, asset holdings (Ebert and Wiesen, 2014; Guiso et al., 1996; Quigley, 2006; Yogo, 2016). These models basically postulate the relationships between risk compensations of different orders and investment decisions. For instance, prudent investors tend to decrease holdings of risky assets to reduce their exposure to risk, while such risks are uninsurable and non-diversifiable (Kimball, 1993).

This study mainly focuses on three distinct features of tenure decision and/or portfolio allocation derived from these previous studies. First, household wealth is not entirely exogenously determined; rather, it is also determined by a household’s multi-period choice of whether or when to become a homeowner (Calem et al., 2010; Haurin et al., 1996a; 1996b).
Hence, a current tenure decision and/or portfolio allocation must be understood in a multi-period framework, including prior housing tenure and portfolio choices. Second, prudent investors decrease or even forego risky assets, while such risks are unable to be hedged (Guiso et al., 1996; Kimball, 1993). This implies that decisions that liquidate assets rather than decisions that acquire assets can be a more appropriate measure to examine the impact of uninsurable and non-diversifiable risks on their tenure and portfolio decisions. Third, and most importantly, as the credit system increasingly plays a deciding role in accumulating wealth, households’ resilience against risk and uncertainty significantly relies on their capital structure to finance real estate ownership, such as the debt-to-equity ratio and the debt service structure (Campbell and Cocco, 2003; Chambers et al., 2009). Consequently, in order to examine whether and how households have more difficulty maintaining real estate ownership under the restructuring of housing finance system, it is necessary to scrutinize the relationship between their capital structure and resilience against risk and uncertainty.

These properties of models of tenure and portfolio choice suggest that the role of the Chonsei system must be examined to understand the distinct dynamics of wealth accumulation in Korea, since the Chonsei deposit can substitute for mortgage loans and/or their own equity as a
financing option for private landlords.\textsuperscript{29}

It is important to note that the major difference between a *Chonsei* and a mortgage is not located with the user costs of housing since the costs can be varied according to the changes in market conditions such as interest rates. Rather, the difference between *Chonsei* and mortgage, which mainly affects the probability of real estate ownership, is within the repayment structures. For instance, while leveraging *Chonsei*, a landlord is free from the pressure to repay the deposit until the end of the rental term – typically two years. While leveraging mortgages, on the other hand, a landlord normally is exposed to the pressure to repay her debt following a monthly repayment and amortization schedule. As a result, mortgage debt dependency will eventually weaken resilience against risk and uncertainty by forcing households to be exposed to uncertainty more often. That is, given that the possible capital structure to finance real estate ownership consists of equity, institutional debts, and the *Chonsei* deposit, households whose debt structure only consists of the *Chonsei* deposit will have higher probabilities of maintaining their real estate ownership despite the impact of risk and uncertainty.

\textsuperscript{29} In order to make a comparison between financing options more reliable, my research exclusively considers the capital structure of landlords since *Chonsei* is not an available option for owner-occupiers.
In order to examine the relationship between households’ capital structure and their serial tenure and portfolio choice, this study employs a multinomial logit model on the basis of annual panel data drawn from the KLIPS. In particular, the model copes with the potential correlation between unobservable individual characteristics and unobservable penchant for decisions and activities by including household and time fixed effects. The following section presents a more detailed elaboration and discussion of this model.
5.4 **Empirical Model and Results**

5.4.1 **Data and Measures**

This study employs annual panel data drawn from the Korean Labor and Income Panel Study to examine the impact of credit constraints on households' serial tenure and portfolio choice. KLIPS is a longitudinal survey, similar to the Panel Study of Income Dynamics in the U.S., which began in 1998 with a nationally representative sample of over 5,000 households in the urban area. Information on individuals and their descendants in these households has continuously been collected, covering various demographic features such as income, expenditure, wealth, employment, education, health, etc. The KLIPS includes comprehensive information on individual household assets and debts, necessary information to examine the capital structure to finance real estate ownership. This study investigates households’ real estate portfolio decisions during the period from 2003 to 2014, which consists of the real estate boom-and-bust cycle that can be divided by the Global Financial Crisis of 2008. In the model, 2,884 households are observed over the period and the total number of observations is 8,299. The reduction from the full sample size is primarily because, following the model specification that traces serial portfolio decisions, households should be observed over at least two consecutive years.
In examining portfolio decisions, I simultaneously consider households’ asset position and their housing tenure. For instance, if owner-occupiers who did not own any other property in the previous year purchase a new income-generating property, those households fall into the “buy” category; otherwise, if owner-occupiers who did not own any other property in the previous year sell their property, they are classified into the “sell” category. If owner-occupiers who did not own any other property in the previous year purchase a new income-generating property but simultaneously become renters, and *vice versa*, I put them in the “mix” category. Finally, households whose tenure and asset position have not changed are classified into the “hold” category, which is designated as a baseline category in the model.

**TABLE VII**

**HOUSEHOLDS’ REAL ESTATE PORTFOLIO DECISIONS**

<table>
<thead>
<tr>
<th>Decision</th>
<th>Observation</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buy</td>
<td>622</td>
<td>7.49</td>
</tr>
<tr>
<td>Mix</td>
<td>146</td>
<td>1.76</td>
</tr>
<tr>
<td>Hold (Baseline)</td>
<td>7,064</td>
<td>85.12</td>
</tr>
<tr>
<td>Sell</td>
<td>467</td>
<td>5.63</td>
</tr>
</tbody>
</table>

Notes: The summation may not yield to 100% due to rounding.
This study primarily focuses on analyzing the impact of uninsurable and non-diversifiable risks on households’ portfolio decisions, and hence risk and uncertainty in the following model are exogenously determined. I divide such external shocks into two categories: shocks to asset price and household. To measure shocks to asset price, this study examines the changes in households’ net worth drawn from the KLIPS. This self-reported data on the current home value and the balance of all outstanding debt may include measurement errors. However, this will likely be more appropriate measures than price indexes or aggregate estimates that lack specific characteristics of properties and borrowers. Households’ assessment of their home value and the balance of outstanding debt can reasonably be compared with external estimates as well, while considering their interests in the value of the assets and liabilities (Bucks and Pence, 2008). Furthermore, the tenure and/or portfolio decisions of a household significantly rely on its perception of its house value and equity position (Bricker and Bucks, 2016). Meanwhile, I consider both employment and health insecurity as the key elements that constitute shocks to household. I use an unemployment insurance benefit as a proxy for measures of economic insecurity in order to exclude households who are voluntarily unemployed. Households’ self-reported change in health status over the previous year is utilized for capturing health insecurity.

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30 It is important to note that the participation in the Korean unemployment insurance is basically mandatory for all workers.
<table>
<thead>
<tr>
<th>Tenure status</th>
<th>Real estate holdings</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Previous</td>
<td>Current</td>
<td>Previous</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>1</td>
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<td>1</td>
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<td>0</td>
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<tr>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

Notes: In the category of tenure status, 1 indicates households who are owner-occupiers; otherwise, 0. Also, in the category of real estate holdings, 1 indicates households who own income generating properties; otherwise, 0.
Finally, it is important to employ appropriate financial measures in order to investigate the interplay of risk and uncertainty, the capital structure, and households’ real estate portfolio decisions. I utilize the Chonsei-to-Debt (CTD) ratio in examining the impact of the capital structure on households’ resilience against risk and uncertainty. As described above, the difference between a Chonsei and a mortgage, which mainly affects the probability of real estate ownership, is within the repayment structures. For instance, while leveraging Chonsei, a landlord is free from the pressure to repay the deposit until the end of the rental term – typically two years. This implies households are less likely to be forced to forgo their real estate ownership during the period of Chonsei lease agreement. While leveraging mortgages, on the other hand, a landlord normally is exposed to the pressure to repay her debt following a monthly repayment and amortization schedule. It is important to note that households who leverage institutional debts only and households who leverage both Chonsei and institutional debts should be on the same frequency of exposures to risk and uncertainty, since their repayment and amortization schedules are indifferent. In order to reflect this peculiarity in the Korean housing finance system, hence, I categorize sample households into two groups according to whether their CTD ratio is 1 or not.
The model includes controls for age of the head of household, sex of the head of household, educational attainment of the head of household, family size, household income and income squared, household net worth, and Seoul Metropolitan Area (SMA) status. The model copes with the potential correlation between unobservable individual characteristics and unobservable penchant for decisions and activities by including household and year fixed effects based upon “hybrid-model” approach (Allison, 2009).31

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31 The hybrid model allows combining the fixed effects estimates of the effects of time-varying variables with the random effects estimates of the effects of time-constant variables. A Hausman test is performed for model specification.
5.4.2 **Analysis of Real Estate Portfolio Decisions**

There are four possible real estate portfolio decisions \((y_{it})\) – buy, mix, hold and sell – for households \((i)\) over the study period \((t)\). As the conditional distribution of the response given the covariate vectors that comprise the vector of controls \((X_{it})\) and the vector of main regressors \((Z_{it})\) follows a multinomial distribution for the four possible categories of the response, the empirical model of this study employs a multinomial logit regression approach.

Next, to address the potential correlation between unobservable heterogeneity and unobservable penchant for portfolio decisions, the model adapts the “hybrid-model” approach. While both the cluster-level means \((\bar{X}_i)\) and the deviations from the cluster-level means \((X_{it} - \bar{X}_i)\) are included in the model, the coefficient estimate associated with the deviations from the cluster-level means will not be correlated with the cluster-level means. Hence, in order to derive unbiased estimates, the coefficient estimates reflect both the within \((\beta)\) and between \((\gamma)\) effects.

Consequently, the general case of categories \(S\) where the probability that the response is category \(s\) becomes

\[
\Pr(y_{it} = s|X_{it}, X_i, Z_{it}, \alpha_i, \beta, \gamma, \delta) = \frac{\exp \left( a_i^{[s]} + \beta^{[s]} DX_{it} + \gamma^{[s]} MX_i + \delta^{[s]} Z_{it} \right)}{\sum_{c=1}^{4} \exp \left( a_i^{[c]} + \beta^{[c]} DX_{it} + \gamma^{[c]} MX_i + \delta^{[c]} Z_{it} \right)}, s = 1, ..., 4
\]
\[ DX_{it} = (X_{it} - X_i) \text{ and } MX_i = X_i. \] (5.1)

It is important to note that, however, the category of probabilities may not be apparent for the range of covariate vectors observed in a given data set, when there are three or more categories (Rabe-Hesketh and Skrondal, 2012). Hence, (5.1) can alternatively be expressed as

\[
\log \left[ \frac{\Pr(Y_{it} = s|X_{it}, X_i, Z_{it}, \alpha, \beta, \gamma, \delta)}{\Pr(Y_{it} = r|X_{it}, X_i, Z_{it}, \alpha, \beta, \gamma, \delta)} \right] = \alpha_i^{[s]} + \beta^{[s]} DX_{it} + \gamma^{[s]} MX_i + \delta^{[s]} Z_{it} \quad (5.2)
\]

where \( r \) is chosen as baseline outcome. I designate the “hold” category as baseline category \( (r) \) by setting the intercept and coefficients for that category to zero. As a result, the odds ratios for the categories of “buy,” “mix,” and “sell” versus the category of “hold,” which correspond to a one-unit increase in the covariate vector \( Z_{it} \), can be obtained as

\[
\text{Odds Ratio}_{s,r} = \exp(\delta^{[s]}). \quad (5.3)
\]

In order to explicate the difference in households’ resilience against risk and uncertainty according to their capital structure to finance real estate ownership, I construct three mutually

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32 The settings of the models of real estate portfolio decisions cannot reveal specific implications for the category of “mix” and hence I will not provide any detailed interpretation of that category.
exclusive groups: households that were exposed to shocks on either asset price or household and their CTD ratio is less than 1 \((z_{1it})\); households that were exposed to shocks on either asset price or household and their CTD ratio is equal to 1 \((z_{2it})\); and households that were not exposed to any shock and their CTD ratio is less than 1 \((z_{3it})\) (see TABLE IX). Households that were not exposed to any shock and their CTD ratio is equal to 1 are the omitted group for comparison.

Hence, the covariate vector of main regressors can be written as

\[
\delta[s]Z_{it} = \delta_1^{[s]}z_{1it} + \delta_2^{[s]}z_{2it} + \delta_3^{[s]}z_{3it}.
\]  

(5.4)

By doing so, each \(\delta\) coefficient directly indicates the difference in households’ resilience against risk and uncertainty according to their capital structure relative to non-vulnerable households that leveraged the Chonsei deposit only.

Before jumping into examining the interplay of risk and uncertainty, the capital structure, and households’ real estate portfolio decisions, this study sheds light on the direct impact of risk and uncertainty on households’ portfolio decisions. Like I construct the covariate vector of main regressors, sample households can be re-categorized as three mutually exclusive groups according to risk and uncertainty in which they encountered: households that were exposed to
shocks to asset price and household at the same time; households that only experienced shocks to asset price; and households that only experienced the economic and/or health insecurity. Households that were not exposed to any shock are the omitted group for comparison as well. The other settings – for instance, the covariate vector of controls – across those models are indifferent.

Intuitively, I anticipate the odds ratios for the “buy” category versus the “hold” category being decreased as risk and uncertainty were more severe – that is, for instance, we can presume households who experienced shocks to asset price and household at the same time met more severe conditions rather than households that only experienced household insecurity, or asset price depreciation. Otherwise, I anticipate the odds ratios for the “sell” category versus the “hold” category being increased as risk and uncertainty were more severe.

Estimated coefficients and odds ratios are reported in the TABLE X. The Wald statistics z with corresponding p-values (P > [z]) of most estimates indicate the significance at 1% level, except the estimates that reveal the impact of shocks to household on portfolio decisions. These results may imply economic and/or health insecurity relatively indirectly cause changes in housing
tenure and/or real estate ownership, while property price depreciation affects households’
portfolio decision more directly.

### TABLE X
IMPACT OF RISK AND UNCERTAINTY ON HOUSEHOLDS’ PORTFOLIO CHOICE

<table>
<thead>
<tr>
<th>Category</th>
<th>Risk and uncertainty</th>
<th>Coefficient</th>
<th>Odds ratio</th>
<th>P &gt; [z]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shocks to asset price and household at the same time</td>
<td>-.746</td>
<td>.474</td>
<td>.001</td>
<td></td>
</tr>
<tr>
<td><strong>Buy</strong></td>
<td>Shocks to asset price only</td>
<td>-.525</td>
<td>.592</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>Shocks to household only</td>
<td>-.162</td>
<td>.851</td>
<td>.326</td>
</tr>
<tr>
<td><strong>Mix</strong></td>
<td>Shocks to asset price and household at the same time</td>
<td>-2.517</td>
<td>.081</td>
<td>.008</td>
</tr>
<tr>
<td></td>
<td>Shocks to asset price only</td>
<td>-.786</td>
<td>.456</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>Shocks to household only</td>
<td>.154</td>
<td>1.167</td>
<td>.616</td>
</tr>
<tr>
<td><strong>Sell</strong></td>
<td>Shocks to asset price and household at the same time</td>
<td>.809</td>
<td>2.246</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>Shocks to asset price only</td>
<td>.779</td>
<td>2.179</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>Shocks to household only</td>
<td>.003</td>
<td>1.003</td>
<td>.992</td>
</tr>
</tbody>
</table>

Notes: Wald statistics $z$ with corresponding p-values, $P > [z]$, are computed with robust standard errors. The category of “hold” is designated as the baseline outcome.
The signs of coefficient estimates and the probabilities of events that can be calculated by the odds ratios satisfy the expectations described above. First, the estimates for the “buy” category versus the “hold” category indicate, for given households, the overall probabilities of buying a new real property compared with maintaining their real estate portfolio are reduced by the risk and uncertainty that are specified in this study. The odds of buying a new real property compared with maintaining the asset position is decreased by about 40.8% as households confronted property price depreciation, while that is reduced by about 14.9% as households experienced economic and/or health insecurity. Furthermore, relative to non-vulnerable households that maintained their asset position, the odds of buying a new real property is reduced by about 52.6 % as households encountered shocks to asset price and household at the same time. Second, for given households, the estimates for the “sell” category versus the “hold” category show the overall probabilities of selling their asset compared with keeping their portfolio are substantially increased by shocks to property market. The odds of selling their asset compared with holding their asset is just increased by about 0.3% as households were exposed to economic and/or health insecurity. However, the probabilities of selling properties compared with keeping their portfolio skyrocketed for households that experienced either property price depreciation or such adverse shock with household insecurity: respectively, the odds ratios are
increased by about 117.9% and 124.6%.

These results strongly support my conceptualization of real estate ownership in Korea in recent decades. As economic and social insecurity have consistently been exacerbated under the new global financial regime, real estate ownership becomes an unnecessary but inevitable option for many households to cope with the emerging risk and uncertainty. Given the circumstances, in making portfolio decisions, households are inevitably more sensitive to property price depreciation, which directly reduces their capabilities to fight against risk and uncertainty, rather than involuntary unemployment or illness, which are the sources of economic insecurity.

Finally, I shift the focus of attention toward the interplay of risk and uncertainty, the capital structure, and households’ real estate portfolio decisions. Estimated coefficients and odds ratios are reported in the TABLE XI. Overall, the signs of coefficient estimates and the probabilities of events that can be calculated by the odds ratios satisfy the proposition of this study, which postulates households whose debt structure only consists of the Chonsei deposit will have higher probabilities of maintaining their real estate ownership despite the impact of risk and uncertainty.
## TABLE XI
INTERPLAY OF SHOCKS, CAPITAL STRUCTURE, AND PORTFOLIO CHOICE

<table>
<thead>
<tr>
<th>Category</th>
<th>Shocks and capital structure</th>
<th>Coefficient</th>
<th>Odds ratio</th>
<th>P &gt; [z]</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Buy</strong></td>
<td>Shocks on either asset price or household, while the CTD ratio is less than 1</td>
<td>-.619</td>
<td>.538</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>Shocks on either asset price or household, while the CTD ratio is equal to 1</td>
<td>-.979</td>
<td>.376</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>No shock, while the CTD ratio is less than 1</td>
<td>-.457</td>
<td>.633</td>
<td>.001</td>
</tr>
<tr>
<td><strong>Mix</strong></td>
<td>Shocks on either asset price or household, while the CTD ratio is less than 1</td>
<td>-.008</td>
<td>.992</td>
<td>.969</td>
</tr>
<tr>
<td></td>
<td>Shocks on either asset price or household, while the CTD ratio is equal to 1</td>
<td>-.170</td>
<td>.843</td>
<td>.743</td>
</tr>
<tr>
<td></td>
<td>No shock, while the CTD ratio is less than 1</td>
<td>-.388</td>
<td>.679</td>
<td>.179</td>
</tr>
<tr>
<td><strong>Sell</strong></td>
<td>Shocks on either asset price or household, while the CTD ratio is less than 1</td>
<td>1.401</td>
<td>4.059</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>Shocks on either asset price or household, while the CTD ratio is equal to 1</td>
<td>.011</td>
<td>1.012</td>
<td>.967</td>
</tr>
<tr>
<td></td>
<td>No shock, while the CTD ratio is less than 1</td>
<td>.130</td>
<td>1.139</td>
<td>.633</td>
</tr>
</tbody>
</table>

Notes: Wald statistics z with corresponding p-values, $P > [z]$, are computed with robust standard errors. The category of “hold” is designated as the baseline outcome.

At first glance, the role of *Chonsei* seems a little vague while buying a new real property compared with maintaining the asset position. The odds of buying new real estate compared
with keeping the asset portfolio is reduced by about 46.2% as households experienced shocks on either asset price or household while their CTD ratio was less than 1. For given households, the odds is decreased by about 62.4% as they confronted shocks on either asset price or household while they only leveraged the Chonsei deposit to finance their real estate. These results imply, in making a decision to increase investment, the capabilities to cope with risk and uncertainty may not be the first thing to be considered.

On the other hand, the role of Chonsei on households’ portfolio decisions under exposure to risk and uncertainty is very clear when we compare the estimates for the “sell” category versus the “hold” category. The odds of selling their property compared with holding their property is increased by about 305.9% as households experienced either involuntary unemployment or illness while they fully or partially relied on institutional debts. However, the odds is just increased by about 1.2% as households experienced either economic or health insecurity while they fully relied on the Chonsei. These empirical results clearly situate the underlying mechanics of how households have had more difficulty maintaining real estate ownership as their dependency on institutional debt has increased under the restructuring of the housing finance system.
5.5 **Conclusion and Policy Implications**

Due to the inexorable demographic trends led by extremely low fertility and rapid aging and sluggish economic growth, most Koreans may not believe the “real estate myth” any more. However, real estate is still the most important asset for Korean households: according to the survey of household finance and living conditions, as of 2016, the proportion of real properties among total household assets is about three-fourths (74.0%).\(^{33}\) In particular, real estate ownership becomes a functionally unneeded but financially necessary option for many families to cope with increasing economic and social insecurity in recent decades. It is important to note that, unlike liquid, transferable assets such as securities, buying or selling real estate is accompanied by significant transaction costs. Consequently, they are highly likely to experience substantial wealth losses in case that they are forced to forgo their real estate ownership immediately due to their less-diversified asset portfolio, as they are exposed to unexpected risk and uncertainty. Furthermore, temporal risk and uncertainty that they encounter are highly likely to be transferred into chronic or permanent household economic insecurity, as their resilience against risk and uncertainty is significantly exacerbated by losing their key asset.

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This study focuses on examining the underlying mechanics of how households have more difficulty maintaining real estate ownership in recent decades. This study particularly investigates the degree to which households’ vulnerability to risk and uncertainty can be differentiated according to the capital structure of their real estate ownership. Unlike the Chonsei system that allows landlords to leverage the deposit without any pressure to repay it until the end of the two-year rental term, institutional debts exert pressure on households to repay their debt following a monthly repayment and amortization schedule. Hence, Korean households are consistently exposed to risk and uncertainty, as their dependency on institutional debt has increased within the restructuring of the Korean housing finance system.

To validate the proposition that postulates the interplay of risk and uncertainty, capital structure, and households’ real estate portfolio decisions, this study employs a multinomial logit regression approach on the basis of annual panel data drawn from the KLIPS. The empirical results indicate households whose debt structure only consists of the Chonsei deposit have higher probabilities of maintaining their real estate ownership despite the impact of risk and uncertainty such as employment and health insecurity and property price depreciation.
These results rebut the common belief that market reform that accompanies new products and services, lower interest rates, and greater liquidity substantially motivates households to purchase real estate. Rather, increasing institutional debt dependency has significantly made households more vulnerable to risk and uncertainty and subsequently experience barriers to building wealth.
5.6 Cited Literature


5.7 **Cited Literature in Korean**


6. CONCLUSION

My dissertation research develops a new way to analyze growing wealth inequality in the Global South. In recent decades, a new financial doctrine – financial globalization – has extensively restructured the legislative, institutional, and regulatory frameworks in both the Global South and North. This global financial order consequently creates economic agents that draw unequal benefits from the market system, as the financial market restructuring eventually reorients the attitudes of a constellation of agents in the market. In particular, as banks increasingly play a key role in forming market choices through market integration and consolidation, the imbalance of power between these financial intermediaries and retail consumers has inevitably been exacerbated. This burgeoning imbalance in the retail banking sector eventually results in financial exclusion, whereby consumers are increasingly sorted and differentiated based on their financial capacity. This model of financial exclusion contributed significantly to explaining growing inequality in the Global North, where individuals and households rely on formal credit to accumulate wealth.

This banking-centered framework, however, inadequately describes the distinct paths that emerging economies have followed as they have transitioned toward the global financial regime.
This is primarily because such economies typically have their own indigenous norms and institutions play a crucial role in accumulating wealth. By shedding new light on the increasing dissonance between *de facto* and *de jure* regimes of accumulation, this study illuminates the evolving mechanics of wealth concentration in the Global South in the era of financial globalization.

This study posits the *Chonsei* system as a distinct mode of regulation in Korea. My premise is that *Chonsei* refers not only to a type of property lease agreement, but also to non-institutional, unregulated and informal housing capital that is invaluable to individuals and households in order to accumulate wealth. This overarching conceptualization of *Chonsei* provides a novel lens into the evolving mechanics of wealth concentration in Korea since it has transitioned toward a financial-led growth regime. First, this study refutes previous models of wealth inequality that draw from axiomatic and pre-social premises of contemporary theories of financial intermediation. Rather, by illuminating the structural distinction that is embedded in the Korean space market, this study explicates its unequivocal role on wealth accumulation. Second, this study focuses primarily on the emerging tension between formality and informality in the whole economic system. As this study eschews the common fallacies of a single market
framework, it better explains growing inequality in that country and ties it to structural changes resulting from greater financial globalization.

The dissertation research develops this approach through three separate research programs that together analyze the emerging tension between formal and informal housing finance systems in Korea. These research programs clearly situate the evolving dynamics of wealth concentration by applying agent-based research approaches such as a microfoundational framework and a model of portfolio choice within conceptual frameworks based upon historical and structural contexts in Korea.

The first research program examines the development of the Korean housing finance system. Its unique development path can be characterized as the history of challenges, which refer to forces that have hindered the accumulation of wealth, and responses, which refer to counteractions that seek alternative modes of wealth accumulation. This overarching characterization consequently allows the following research programs to situate inequalities in wealth that are set in motion through the chronic tension between formal and informal housing capital.
The second research program examines why and how there has been the radical debt shift from corporate to consumer holdings in Korea over the past decade. Within strict LTV limits, banks are willing to approve mortgage loans unless borrowers fail to secure a down payment since lenders have a larger cushion against losses in cases of default. At the same time, despite the strict regulatory environment, unregulated housing credit such as Chonsei typically allows borrowers to relax their down payment requirements. As a result, even strict LTV prudential limits will have limited power to control the increasing debt dependency of households as long as the unregulated credit can easily be accessed. I test this proposition through an empirical analysis of the Korean housing finance system using a panel instrumental variables regression approach. The empirical results indicate that over the past decade there has been explosive growth in residential mortgage lending despite the strict macroprudential limits, as banks can transfer their business risks that would normally be hedged in the financial market onto the space market where the Chonsei system operates.

The third research program examines how such radical debt shift has constructed barriers for household wealth accumulation. This study particularly focuses on investigating the degree to which households’ vulnerability to risk and uncertainty can be differentiated according to the
capital structure of their real estate ownership. Unlike the Chonsei system, which requires infrequent debt payments, institutional mortgages require periodic debt payments, which compel households that leverage mortgages to be exposed to risk and uncertainty more often. That is, risk and uncertainty are less likely to be realized while households leverage the Chonsei deposit rather than institutional debts. This study employs a multinomial logit regression approach on the basis of annual panel data drawn from the Korean Labor and Income Panel Study. The empirical results indicate households whose debt structure only consists of the Chonsei deposit have higher probabilities of maintaining their real estate ownership despite the impact of risk and uncertainty.

The main implications of my dissertation research are threefold. First, in terms of tenants and/or renters, this study situates how a fundamental change in the inherent sociality of the Chonsei system of housing tenure structurally hinders their pursuit of homeownership. Due to the radical market reforms in finance-led growth regime, the Chonsei system of housing tenure becomes available exclusively for tenants that have had inherited wealth in assembling the deposit. As this distinct mode of regulation is not a common, prevalent means of wealth accumulation for tenants any longer, obviously, they will confront differentiated conditions to
transform their tenure and/or to build wealth – which will be a structural source of wealth inequality.

Second, in terms of owner-occupiers and/or landlords, this study situates how the reconstitution of housing capital discriminatorily reconstructs their resilience against economic and social insecurity to maintain the real estate ownership. The increasing dissonance between and formal and informal housing capital, which is intertwined with ill-designed market reforms and policies, creates junctions to transfer risk and uncertainty in the financial market onto the space market. However, such risk and uncertainty are less likely to be realized while households leverage the Chonsei deposit rather than institutional debts. Hence, if the Korean housing finance market fails to recover the role of Chonsei and/or to develop institutional alternatives to the Chonsei system, the market will severely suffer from the lack of housing demand, stemming from increasing wealth inequality and chronic economic insecurity.

Third, this study provides a novel lens into the evolving mechanics of wealth concentration in emerging economies. The findings of my dissertation research explicitly contradict contemporary theories of financial intermediation, which stem from axiomatic and pre-social
premises of neoclassical economic thought. Instead, on the basis of historical circumstances and structural distinctions in the housing finance system, my research explicates the evolving dynamics of wealth concentration in Korea, as it has transitioned toward financial globalization. By doing so, this study suggests that models of wealth inequality that draw from vocabulary developed in the Global North need to adapt to historical circumstances and structural distinctions in countries of the Global South in order to illuminate the true nature of wealth inequality.