Why is China's Savings Rate so High?

by

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Abstract

China's economy is quite distinctive in the modern world as it has a comparatively high savings rate. China's rapid growth in recent years has depended on a development model that has rested heavily on industrial investment and exports. To balance China's economic structure and provide more sustainable growth, a shift toward a stronger reliance on domestic consumption is necessary. Identifying the causes of China's high savings rate could shed light on approaches to stimulate domestic consumption. Although progress has been made to understand the Chinese saving behaviors from the point view of economics, a significant void in the perspective of political science and public administration remains. Complementing prior research, this study aims to add political and governmental factors of China's high savings rate to the current literature. Based on a panel data of 91 countries over the time span from 1980 through 2010, this dissertation finds that the main factors of China's high savings rate include GDP per capita, GDP growth rate, borrowing constraints, gender imbalance, social safety net, political stability, and government regulation quality. In addition, China's national savings are broke down into three parts: enterprise, household, and government savings. All of the three sectors have contributed to the high savings rate in China. However, the real driver behind the high aggregate savings rate is the Chinese government. The high savings rate is the product of a series of government policies that have prioritized investment and export

over consumption. Political and governmental factors exert an influence on savings

rate.

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List of Abbreviations

ABC   Agricultural Bank of China

BOC   Bank of China

BRICS   Brazil, Russia, India, China, and South Africa

CCB   China Construction Bank

CCP   Chinese Communist Party

FDI   Foreign Direct Investment

FLG   Falun Gong

GDP   Gross Domestic Product

GNI   Gross National Income

ICBC   Industrial and Commercial Bank of China

ICRG   International Country Risk Guide

NBS   The National Bureau of Statistics of China

NPLs   Non Performing Loans

OECD   Organization for Economic Cooperation and Development

PBC   The People's Bank of China

SMEs   Small and Medium-sized Enterprises

SOEs   State-owned Enterprises

WDI   World Development Indicators

WGI   Worldwide Governance Indicators

WTO   World Trade Organization

CHAPTER 1 INTRODUCTION

China overtook Japan to become the world's second-largest economy after the

United States in 2010, but China's economy is quite distinctive in the modern world

as it has a comparatively high savings rate. In 2012, China's national savings

constituted 51 percent of its national income, whereas the savings of the United States

took up only 16 percent of its national income (World Bank 2012). Figure 1.1

compares China with other countries, including its East Asian neighbors (Japan and

South Korea), other BRICS countries (Brazil, Russia, India, and South Africa), and

the United States. [1] Since 1982 China has one of the highest savings rate in the world.

Other high-savings countries include Japan and South Korea. However, from 2000

onwards, China's national savings rate soared further and increased along a steep

trajectory, leaving the other countries far behind (even including its high-savings East

Asian neighbors).

Why is China's savings rate so high? This question is of great theoretical

value and practical significance. China's rapid growth in recent years has depended

on a development model that has rested heavily on industrial investment and exports

(Woetzel et al. 2009; Lardy 2007; Anderson 2007). It is widely recognized that high

savings rate is one of the determining factors of China's economic rise (Harbaugh

2004; Aziz and Dunaway 2007). The high savings rate played a vital role in

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[1] BRICS is the acronym for an association of five major emerging national economies: Brazil, Russia, India, China, and South Africa. They are distinguished by their large, fast-growing economies and significant influence on regional and global affairs

facilitating China to maintain rapid investment and export growth, especially in the 1980s when foreign capital was difficult to attain (Harbaugh 2004; Aziz and Dunaway 2007; Gallagher 2002). However, the two pillars of the Chinese economy—investment and export—are not very firm. The global financial crisis in 2008 interrupted China's rapid growth. The Chinese National Bureau of Statistics (NBS) reported that China's GDP growth fell to 6.1 percent in the first quarter of 2009 after an average growth rate of 10 percent during 1980-2008.[2]

Figure 1.1 Gross National Savings Rate (percent of gross national income), 1980-2010

Source: World Bank World Development Indicators
(http://data.worldbank.org/indicator).

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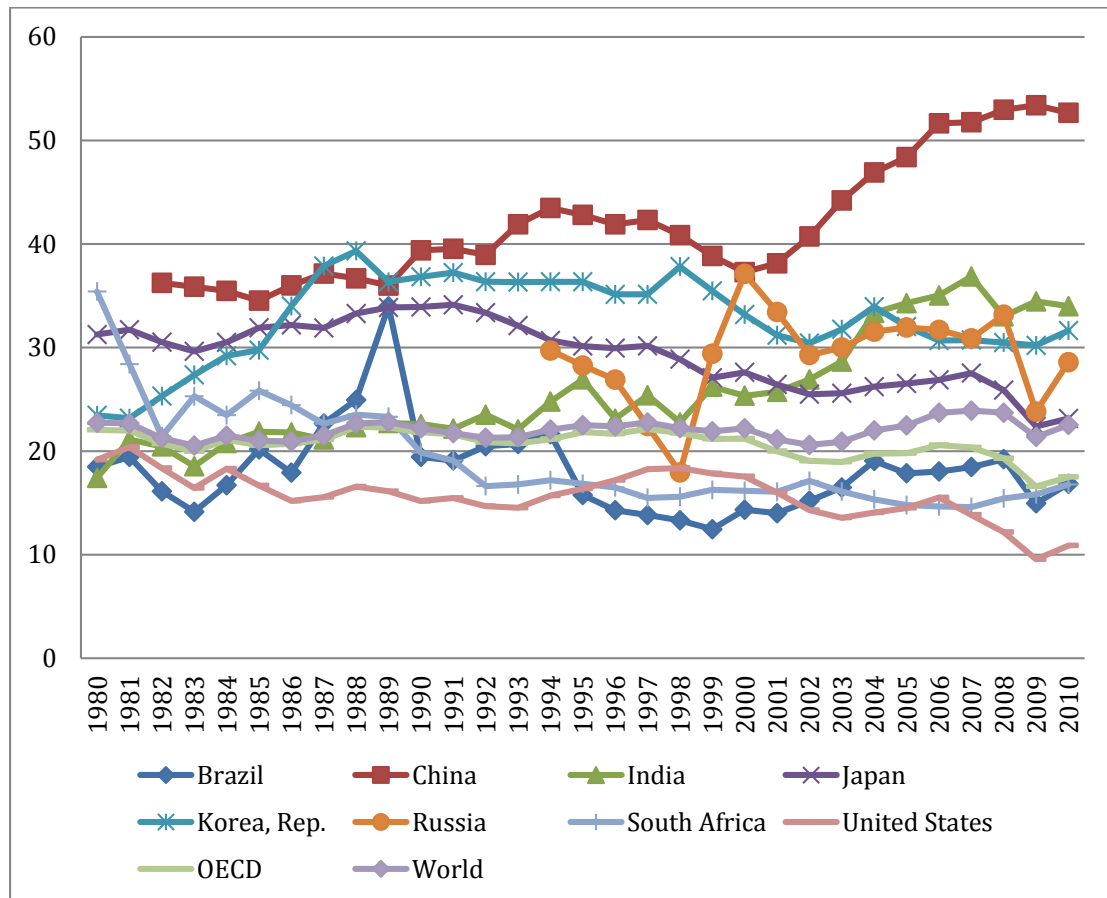
[2] http://www.chinadaily.com.cn/bizchina/2009-04/16/content_7683783.htm

The sharp slowdown reflected the vulnerability of the Chinese economy to foreign markets. In addition, China's investment-led model has "skewed the economy toward industry and has made corporate investment too cheap, leading to inefficient investment in excess capacity" (Woetzel et al. 2009). The Former Chinese Premier Wen Jiabao summarized at a press conference after the National People's Congress in 2007, "there are structural problems in China's economy which cause unsteady, unbalanced, uncoordinated and unsustainable development." To balance the economic structure and provide more sustainable growth at home, a shift toward a stronger reliance on domestic consumer spending is necessary. Identifying the causes of China's high savings rate could shed light on approaches to stimulate domestic consumption.

Despite an extensive body of work on this subject, debates continue mainly among economists (Anderson 2007; Aziz and Cui 2007; Barnett and Brooks 2010; Chamon and Prasad 2008; Guo and N'Diaye 2010; Hung and Qian 2010; Kraay 2000; Loayza, Schmidt-Hebbel, and Servén 2000a; Modigliani and Cao 2004; Qi and Prime 2009; Qian 1988; Ma and Yi 2010b). However, China's situation is "not easy to reconcile with economic theory" (Harbaugh 2004, 1). Theory predicts that consumers with increasing incomes should start spending more immediately to enjoy the benefits of future income growth. Clearly this is not the case in China (Harbaugh 2004; Wen 2009). Although progress has been made to understand Chinese saving behavior from the point of view of economics, a significant void from the perspective of political science and public administration still remains. Political and governmental factors exert a significant influence on a country's economic performance (Haggard and

Kaufman 1989; Olson, Sarna, and Swamy 2000; Huntington and Dominguez 1975; Przeworski et al. 2000; Nye 1967). Complementing prior studies, this study aims to add political and governmental factors to the current literature on China's high savings rate, using variables such as political regime, political stability, regulatory quality, and control of corruption. This study provides a new perspective to explore the factors explaining China's high savings rate.

Based on a panel data study covering 91 countries from 1980 to 2010, I found that the main determinants of savings rates include GDP per capita, GDP growth rate, borrowing constraints, gender imbalance, social services, political stability, and regulatory efficiency. In addition, the findings of the panel data study are applied to and confirmed in China's case. The fact that China's national savings rate is high (even higher than its high-saving East Asian neighbors) is due to China's remarkably high GDP growth rate, low GDP per capita, stringent borrowing constraints, gender imbalance, limited social services, political instability, and poor regulatory quality. Additionally, to further explore the sources of high savings, China's national savings are broke down into three parts: enterprise, household, and government savings. All of the three sectors have contributed to the high savings rate in China. However, the real driver behind the high aggregate savings rate is the Chinese government. The high savings rate is the product of a series of government policies that have prioritized economic growth over the welfare of the public. Political and governmental factors exert an influence on savings rate.

China's Pattern of Growth

Since 1978, China has experienced an unprecedented growth pace and reaped tremendous benefits. In the 20 years between 1987 and 2007, China added about $2 trillion to world GDP, created 120 million new jobs, and pulled 400 million people out of poverty (Aziz and Dunaway 2007, 27). China's economic growth is based on a development model that rested heavily on investment and exports (Aziz and Dunaway 2007; Woetzel et al. 2009; Guo and N'Diaye 2011). During 2001−2008, net exports and investment accounted for over 60 percent of China's growth, up from 40 percent in the 1990s. This is much larger than the 2001–2008 average of China's Asian neighbors, Euro area, and the G7 (Guo and N'Diaye 2011).

At around 40 percent of GDP, China has now one of the highest investment rates in the world. Investment goes primarily into manufacturing, infrastructure, and the real estate sector. It is financed mainly by retained earnings and bank loans (Guo and N'Diaye 2011; Aziz and Dunaway 2007).

Also focusing on exports, China has become the "world's workshop." According to the World Trade Organization, China's exports of manufactured goods grew at an annual average rate of 25.2 percent between 2000 and 2008. In 2008, China surpassed Germany to become the world's largest exporter of manufactured goods (World Trade Organizaiton 2009). China is now the world's second largest trading nation behind the United States, with merchandise trade totaling $ 3,867 billion in 2012 (World Trade Organizaiton 2013). China's export-oriented growth is not new; Japan, Korea, and other Asian countries have all "maintained rapid exports growth and increased market shares over a sustained period of time" (Guo and

N'Diaye 2011, 83).

However, China's investment and export-led development model is not sustainable in the long run (Lardy 2007; Anderson 2007; Guo and N'Diaye 2011). First, investment-driven growth is leading to less efficiency in the use of resources. Low financing cost and other investment-oriented government policies encourage overinvestment and the emergence of excess capacity in a number of important industries, such as steel and cement. Second, compared with consumption-driven growth, investment and export-led development growth generated very modest gains in employment. Capital-intensive industries generally employ far fewer workers per unit of capital than do light industries and service sectors. Third, investment-driven growth led to burgeoning energy consumption and serious environmental problems.

China's Level of Savings

China's investment and export-oriented development model has been encouraged by the low cost of capital, utilities, pollution, energy, land, and tax incentives (Guo and N'Diaye 2011; Aziz and Dunaway 2007). But perhaps most important is the cheap capital. Investment accounts for nearly 45 percent of China's GDP, and 90 percent of that is financed domestically (Aziz and Dunaway 2007). Due to the low deposit rates set by the Chinese government, domestic bank lending and reinvested earnings of enterprises are the major financing sources. Foreign direct investment (FDI) accounts for less than 5 percent of GDP. There is no doubt that FDI once played an important part in China's rapid development, particularly in transferring advanced foreign technology. However, FDI has "not been a key source of financing in China" (Kujis 2006, 14).

According to Ma and Yi, China's savings rate is high by "historical experience, international standards and model predictions and also has been rising over time (especially in the 2000s)" (Ma and Yi 2010b). In 2006, China's savings ratio exceeded 50percent of GDP, far above all the OECD countries and the rest of the Asian countries. In addition, the reported Chinese savings rate is high relative to "predictions by structural models based on macroeconomic determinants such as income level and growth, demographics, fiscal policy, terms of trade, financial development, and uncertainties" (Ma and Yi 2010b, 7). Cross-country empirical panel regression studies have often identified China as a clear outlier (Kujis 2006; Kraay 2000).

Such a high savings rate is rare but by no means unique to China. Japan and South Korea in their transition phases also experienced large and sustained rises in their savings rates. What sets China apart from the experiences of other fast-growing Asian economies, though, is that savings have occurred with much lower income levels (Loayza, Schmidt-Hebbel, and Servén 2000a). Further the Chinese savings far outpaced its already high investment, and therefore it resulted in a large current account surplus during China's transition to a market economy (Ma and Yi 2010b; Anderson 2007). Generally, a sharply rising investment ratio drives the current account into deficits. However, this is not the case in China. As Anderson states, "this regularity has played itself out again and again in emerging markets across the globe, except in China, where a rising investment rate and a rocketing current account surplus have gone hand in hand" (2007, 32).

Organization of the Study

This dissertation aims to explore the factors that have driven China's high savings rate. The organization of the study is as follows. Chapter 2 provides a comprehensive review of extant literature, which leads me to identify key variables related to national savings and consumption. First, economic theories on why people save will be briefly presented, including Keynesian absolute-income hypothesis, Duesenberry's relative-income hypothesis, Friedman's permanent-income hypothesis, and the Modigliani-Brumberg life-cycle hypothesis. Second, I will provide a review of determinants that drive different savings rates across different countries. Finally, chapter 2 clarifies the gaps in the research that this dissertation fills, and will discuss potential political and governmental factors of savings rates.

Following the literature review, hypotheses will be proposed in Chapter 3. Then, I will outline the methods to test these hypotheses, including the research model, independent variables, dependent variables, control variables, data sources, and data analysis techniques. Chapter 4 reports the results of the panel data study.

A comparison of China and Japan's savings rates is presented in Chapter 5. The variables found to be most significant in the quantitative study will be applied to China and Japan's situations. In addition, China's national savings will be analyzed by its components: Corporate, household, and government savings.

Finally, chapter 6 reports this study's contribution to the current literature on China's savings rate. It will also discuss the limitations and future research directions.

CHAPTER 2 LITERATURE REVIEW

This chapter provides a comprehensive review of studies exploring why countries' savings rates differ. The first section presents the advantages and disadvantages of high savings rate. Secondly, a brief review of economic theories of savings will be presented, including Keynesian absolute-income hypothesis, Duesenberry's relative-income hypothesis, Friedman's permanent-income hypothesis, and the Modigliani-Brumberg life-cycle hypothesis. Thirdly, I will identify determinants that drive different savings rates across different countries. This section will also clarify the gaps in the research that this dissertation fills. Finally, political and governmental factors of savings rate will be proposed.

The Advantages and Disadvantages of High Savings

Advantages of High Savings

Savings play a central role in a country's economic performance. According to Samuelson and Nordhaus (2009), countries that save and invest a large proportion of their incomes tend to have rapid growth of output, income, and wages; this pattern characterized the United States in the nineteenth century, Japan in the twentieth century, and the economies of East Asia in recent decades. By contrast, countries that consume most of their incomes, like many countries in Africa and Latin America, have obsolete capital and infrastructure, low educational standards, and backward techniques; they experience low rates of growth in productivity and real wages (Samuelson and Nordhaus 2009).

National saving is the "source of the supply of capital, a major factor of production controlling the productivity of labor and its growth over time" (Modigliani 1986, 297). Because of the relation between saving and productive capital, thrift has "traditionally been considered as a virtuous, socially beneficial act" (Modigliani 1986, 297).

China's high savings rates are one of the decisive factors in China's economic rise. Harbaugh (2004) lists the following roles of high savings in China's economic development. [3]First, high savings rate played an early role in China's successful transition from command economy to market economy by allowing China to maintain rapid investment Because of the high domestic savings, China was able to avoid the collapse in investment witnessed in Eastern Europe and Russia. Second, since rapid growth is itself a generator of high savings, China has been able to re-invest savings, leading to even higher growth. Third, China's high savings rate has promoted exports by inducing a trade surplus. Rather than being a large importer as is common in developing countries, China has typically run a trade surplus. Fourth, high savings rate has helped China maintain stability in its external accounts by inducing a trade surplus. The trade surplus has allowed China to keep the exchange rate stable over an extended period, making investment by domestic and foreign companies less risky. It has also enabledChina to reduce the need for international debts and accumulate large foreign exchange reserves, thereby reducing the risk of financial crises such as the

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[3] The following advantages of high savings for China are from Harbaugh, Rick 2004. "China's High Savings Rates."

1997 Asian crisis. [4] Fifth, China's high savings rate has helped domestic financial stability. Despite the high rates of non-performing loans, state-owned banks have been able to avoid a crisis in part because of the increasing inflows of new savings. High savings rates have given China more time to solve the non-performing loan problem.

Disadvantages of High Savings

Contrarily, savings sometimes can be "potentially disruptive to the economy and harmful to social welfare" (Modigliani 1986, 297). According to Keynes, if people try to increase their savings, there will supposedly be a decrease in spending, and a fall in employment and production. As a result, an increase of intended savings may lead to a decline in actual savings. This is called the "paradox of thrift." The paradox states that if everyone tries to save more money, then aggregate demand will fall and will in turn lower total savings in the population because of the decrease in consumption and economic growth.

> For although the amount of his own saving is unlikely to have any significant influence on his own income, the reactions of the amount of his consumption on the incomes of others makes it impossible for all individuals simultaneously to save any given sums. Every such attempt to save more by reducing consumption will so affect incomes that the attempt necessarily defeats itself. It is, of course, just as impossible for the community as a whole to save less than the amount of current investment, since the attempt to do so will necessarily raise incomes to a level at which the sums which individuals choose to save add up to a figure exactly equal to the amount of investment (Keynes 1936, 84).

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[4] Asian financial crisis was a series of currency devaluations and other events that spread through many Asian markets beginning in the summer of 1997. The currency markets first failed in Thailand as the result of the government's decision to no longer peg the local currency to the U.S. dollar. Currency declines spread rapidly throughout South Asia, in turn causing stock market declines, reduced import revenues and even government upheaval.

The paradox is that total savings may fall even when individual savings attempt to rise, and that increase in savings may be harmful to an economy. Over saving has been seen as having played a significant role in the American Great Depression (Modigliani 1986). Thrift caused inadequate demand and hence output and employment lower than the capacity of the economy.

China's high savings also have many disadvantages for its economy. Consumption-and service-led economies tend to create more jobs. In addition, consumption is "a stronger source of growth that would create more internal economic stability and less exposure to external shocks" (Woetzel et al. 2009). The economic downturn triggered initially by the fallout of the U.S. banking crisis decreased China's exports and underlined the economy's vulnerability to events beyond its control (Woetzel et al. 2009). Promoting domestic consumer spending would not only provide more sustainable and fruitful growth at home but would also help to insulate China from external shocks.

Main Economic Theories of Savings and Consumption

In this section, leading economic theories on why people save will be briefly presented, including Keynesian absolute-income hypothesis, Duesenberry's relative-income hypothesis, Friedman's permanent-income hypothesis, and the Modigliani-Brumberg life-cycle hypothesis.

Keynesian Absolute-Income Hypothesis

In 1936, Keynes proposed his consumption theory in *The General Theory of Employment, Interest, and Money*,

> The fundamental psychological law, upon which we are entitled
> to depend with great confidence both *a priori* and from our

knowledge of human nature and from the detailed facts of experience, is that men are disposed, as a rule and on the average, to increase their consumption, as their income increases, but not by as much as the increase in their income (Keynes 1936, 96).

Keynes's basic model of consumption was that current consumption expenditures are determined mainly by current disposable income. He also proposed the concept of "marginal propensity to consume." As national income increases, consumption spending increases by diminishing amounts. That is, the marginal propensity to consume decreases as income increases, and therefore the savings rate increases. Moreover, Keynes (1936) listed eight motives for saving.

- Precaution. To build up a reserve against unforeseen contingencies.

- Foresight. To provide for an anticipated future relation between the income and needs of the individual or his or her family different from that which exists in the present (for example, retirement and education).

- Calculation. To enjoy interest and appreciation.

- Improvement. To enjoy a gradually increasing expenditure, since it gratifies a universal instinct to look forward to a steadily improving standard of life.

- Independence. To enjoy a sense of independence and the power to do things.

- Enterprise. To secure a capital mass to carry out speculative or business enterprise.

- Pride. To bequeath a fortune to others.

- Avarice. To satisfy pure miserliness.

Keynes' theory of saving was accepted by his contemporaries. However, in 1942, American economist Simon Kuznets showed that Keynes' theory contradicted

with some statistical data. The savings rate of the United States, as a percentage of national income, had not undergone a long-term increase despite an enormous increase in personal incomes. The percentage of disposable income that is consumed is constant in the long run (Kuznets 1946). Explaining the Kuznets paradox soon became a primary goal of a number of studies.

Duesenberry's Relative-Income Hypothesis

One of the solutions to the Kuznets paradox is the relative-income hypothesis proposed by James Duesenberry. Duesenberry (1949) asserted that a household's consumption depends not only on its current disposable income, but also on current income relative to past levels and relative to the income of other households. The relative-income model was formulated in two variants: a cross-section version and a time-series version. In the cross-section version, Duesenberry (1949) argued that a household tends to align its consumption expenditures with those of other members of its group. Thus, households with lower income within the group will consume a larger proportion of their income to "keep up," while households with high incomes relative to the group will save more and consume less. In the time-series version, each household is assumed to consider its current income relative to its past income levels. A household that has in the past achieved income levels higher than its present levels would attempt to maintain the high consumption levels that it achieved earlier. Thus, when incomes fall, consumption would not fall in proportion. The relative income hypothesis enjoyed considerable popularity in the 1950s and the 1960s.

Life-Cycle Hypothesis and Permanent-Income Hypothesis

"The point of departure for most modern research on consumption and saving" is one of two dominant paradigms: the life-cycle model associated with Franco Modigliani and the permanent-income hypothesis developed by Milton Friedman (Schmidt-Hebbel and Servén 1997, 14). In the permanent-income hypothesis, Friedman (1957) considered infinite-lived households and distinguished between a standard level of income that they expect over their lives, he called permanent income, and deviations from that level, which he termed transitory income. While consumption is determined by current income under the simple Keynesian hypothesis, the permanent-income hypothesis contends that consumption is related to permanent income. Permanent income is the annuity value of lifetime income and wealth. It may differ by some unexpected gain or loss from the actual income earned, however, the transitory income does not influence a household's marginal propensity to consume from year to year. Households spend a fixed fraction of their permanent income on consumption. Friedman's PIH provided a reasonable explanation of the empirical consumption puzzle. At a theoretical level, its construct of permanent income introduced income expectations, thereby adding a forward-looking dimension to consumption theory (Palley 2005).

As to the life-cycle model, its "most celebrated and most investigated prediction" is that there is a relation between aggregate saving and the rates of population and income growth (Deaton 1989, 76). Departing from Keynes's contention of a greater proportion of income being saved as real income increases, Modigliani (1954) claimed instead that the percentage of income saved is virtually

independent of income. What matters is the long-term rate of income growth. Besides

growth rate, saving is also affected by population growth as well as by population age

structure. Over the life cycle, according to Modigliani, saving and consumption

follow hump -shaped patterns, with dissaving until early adult age, the peak of saving

at mid -life, and dissaving during retirement as households run down their retirement

assets. With the hump-shaped patterns of saving, population growth will provide

more savers than dissavers, and therefore increases aggregate savings. In addition,

income growth also has a similar effect. When the economy is growing, workers'

saving will increase relative to retirees' dissaving, thereby raising aggregate saving.

Introducing concepts of stage of life and population age distribution, Modigliani's

life-cycle hypothesis constituted the basis of theoretical and empirical analyses of

consumption and saving.

The Inconsistency of Economic Theories with China's Savings

China's savings rate is not consistent with the economic theories. Based on

the life cycle hypothesis and permanent income hypothesis, people smooth out

consumption over time by saving when their incomes are high and dissaving when

their incomes are low (Harbaugh 2004). Accordingly, consumers with rising incomes

should increase consumptionso as to enjoy the benefits of future income growth. But

this is not the case in China. China's savings rate has been rising rapidly over time,

especially in the 2000s. "That savings would grow in a country emerging from

poverty is not necessarily surprising, but the magnitude of the rise in China is not

easy to reconcile with economic theory" (Harbaugh 2004, 1). Moreover, several

scholars found a U-shaped profile of savings over the life cycle in China instead of

the traditional "hump-shaped" pattern (Chamon and Prasad 2008; Yang, Zhang, and Zhou 2011). According to Chamon and Prasad (2008), the age-saving profile starts to shift to a U-shaped pattern in the mid-1990s, and this pattern becomes more pronounced in the 2000s. That is,young households save a lot more of their income than was the case a decade ago. Savings rates then decline with age with a trough around the 40s, before rising as the household head approaches retirement age. This type of saving behavior—the relatively high savings rates at the early and late stages of life cycle—is puzzling as it does not conform to the standard life cycle model.

In fact, the pattern of an increasing savings rate at a time of highincome growth has previously been witnessed in many Asian economies, such as Japan and South Korea. Summarizing the results of the validity tests of the life cycle model, which examines the extent of asset decumulation by the aged, Horioka (1990) concludes that neither the independent aged nor the dependent aged dissave in Japan and the life cycle model is less applicable in explaining Japan's high household savings rate. Hayashi (1986) also rejects life cycle hypothesis as a plausible theory of Japan's saving behavior. "The recurrence of this pattern (of high income growth leading to high savings rate) in China, now the world's second largest economy, heightens the challenge that it presents to economic theory" (Harbaugh 2004, 1).

Proposed Determinants of Savings and Consumption

Based on the above-mentioned theories and other empirical studies (Loayza, Schmidt-Hebbel, and Servén 2000b; Carroll and Weil 1994; Modigliani and Cao 2004; Modigliani 1970; Deaton 1989; Hung and Qian 2010; Guo and N'Diaye 2010; Feldstein 1980), this section identifies factors that have been proposed to explain

different savings rates across the world. These factors are categorized into three groups: economic factors, demographic factors, and governmental factors. These points will be used as building blocks in establishing an explanatory framework of savings.

Economic Factors

Income. According to Keynes' consumption theory**,** individuals consume a decreasing, and save an increasing, percentage of their income as their income increases. Saving is considered to be a positive function of income. In addition, at a given point in time people with higher incomes tend to save a larger share of income than lower-income people. Moreover, the influence of income on saving is generally more pronounced in developing, rather than in developed, countries: A doubling of income per capita is estimated to increase the long-term private savings rate by 10 percentage points of disposable income in developing countries (Loayza, Schmidt-Hebbel, and Servén 2000b). Multiple empirical studies have shown that the level of real per capita income positively affects savings rates (Carroll and Weil 1994; Edwards 1995; Loayza, Schmidt-Hebbel, and Servén 2000b; Schmidt-Hebbel, Webb, and Corsetti 1992).

Growth rate. As an alternative to the Keynesian model, the life-cycle hypothesis states that national savings rates depend on the long-term income growth rate rather than on per-capita income (Modigliani and Cao 2004). For example, China's savings rate rose to a remarkably high level (about 40percent of GDP) in the early 1990s despite the fact that its per capita income was one of the lowest ($300–$400) in the world at the time (Modigliani and Cao 2004). However, China's GDP

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growth rate was also extraordinarily high (about 12percent). A strong positive

association between savings rates and real per capita growth has been found in many

empirical studies (Baumol, Blackman, and Wolff 1991; Bosworth 1993; Carroll and

Weil 1994; Modigliani 1970). In contrast, there were also many studies stating that

the relationship between saving and growth runs in the other direction: higher saving

results in higher growth through the saving-investment link (Levine and Renelt 1992;

Romer 1987; Solow 1956).

However, some scholars contend that the relationship from growth to saving is

stronger. Bosworth's (1993) comprehensive summary on the determinants of saving,

investment, and growth concludes that the link from growth to saving is much more

robust than that from saving to growth. Attanasio, Picci, and Scorcu (2000) examine

the dynamic relationship among saving, investment, and growth rates using a large

panel data set of 123 countries over the period 1961–1994. Employing a variety of

samples and econometric techniques, they consistently find that growth leads to

higher savings. They also find that increases in savings rates do not always precede

increases in growth. In a study on the determinants of saving and growth across the

world, Loayza, Schmidt-Hebbel, and Servén (2000b) found that the income growth

rate is among the most robustly significant variables explaining the national savings

rate. These results hold for subsamples of industrial countries and less-developed

countries as well as for the full sample of countries.

Borrowing constraints. Borrowing constraints that prevent consumers from

borrowing for current consumption have been traditionally "held against the

predictions of the standard PIH or LCH" (Schmidt-Hebbel and Servén 1997, 19). [5]

Consumers sometimes save a lot even when the rate of income growth is high, such

as Japan in the 1950-1970s and China in the past 30 years (Wen 2009). It is argued

that this is partly because of the existence of borrowing constraints (Horioka 2007;

Wen 2009). Borrowing constraints are a result of "real-world financial market

features" (Schmidt-Hebbel and Servén 1997, 19). In most developing countries,

borrowing constraints are binding: there is no credit available to non-favored

borrowers (Deaton 1989). In fact, when borrowing constraints and precautionary

saving are considered together, risk-averse and forward-looking consumers raise their

savings when they anticipate tighter constraints (Carroll and Kimball 2001; Deaton

1989, 1991; Wen 2009). Once the borrowing constraint is made less stringent, present

consumption will increase and, national savings will tend to decline (Edwards 1996).

Japan's household savings rate has shown a downward trend since the mid-1970s.

One of the reasons is that consumer credit has become increasingly available with the

rapid development of credit markets (Horioka 2007).

Demographic Factors

  Age-dependency ratio. According to the life-cycle hypothesis, another factor

that affects the savings rate of a country is its demographic structure with the

relationship between working and nonworking populations being the most important

factor (Modigliani and Cao 2004). While the working population both earns income

and consumes, the nonworking population consumes without producing any incomes;

depending upon the ratio of employed to unemployed at any given time, the overall

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[5] PIH stands for Permanent-Income Hypothesis. LCH stands for Life-Cycle Hypothesis.

effect can be a substantial reduction in national saving (Modigliani and Cao 2004). As a result, saving follows a hump-shaped pattern (high at middle age and low in both young and old ages). Based on a large cross-section of countries, Modigliani (1970) demonstrated that both the ratio of the pre-working population (under 20) and of the retired population (age 65 and over) to the working-age population (20 to 65) had a strong and significant negative effect on savings. Other economic scholars also found the savings rate to be a negative function of the young dependency ratio or the old dependency ratio (Graham 1987; Hung and Qian 2010; Loayza, Schmidt-Hebbel, and Servén 2000b; Masson and Tryon 1990).

The level of urbanization. Depending heavily on agricultural income, in the absence of financial markets through which risks can be diversified, rural residents tend to save a larger proportion of their income (Loayza, Schmidt-Hebbel, and Servén 2000b, 174). Income derived from agriculture is inherently uncertain. Uncertainty at low income poses a real threat to consumption levels, a threat that "is likely to exert a powerful influence on the way in which income is saved and spent" (Deaton 1989, 64). In addition, limited choices related to obtainable commodities and services can also yield relatively high savings rates in rural areas. Households in some developing countries still do not have access to even the most basic services such as running water and electricity. However, industrial countries have a higher degree of urbanization than developing countries and tend to have a lower savings rate. Multiple empirical studies provide supporting evidence for this view (Edwards 1996; Loayza, Schmidt-Hebbel, and Servén 2000b). The Lewis model (1954) also sheds light on the relationship between urbanization and savings rates. Lewis contends that

in a developing economy, there is always a labor transition between two sectors: the modern sector and the traditional sector. The modern sector with higher productivity attracts surplus labor from the traditional sector at relatively low wage rates. As a result, there will be "a rising profit share in income, accelerated capital accumulation, faster economic growth during the transformation process and, therefore, a higher savings rate" (Ma and Yi 2010a, 8).

The percentage of female population. Wei and Zhang (2011) propose a competitive motive for saving: as the number of men per woman in the premarital cohort rises, Chinese parents with sons increase their savings in a competitive manner to "improve their son's relative attractiveness for marriage"(Wei and Zhang 2011, 511). Due to the Chinese traditional preference for sons and the one-child policy, there is a surplus of men; this, in turn, has generated a highly competitive marriage market. Facing the reality of the scarcity of women in the marriage market, a large number of couples with sons greatly increase their rate of saving. Both cross-regional and household-level evidence supported their hypothesis. Moreover, they state that although the evidence focuses on China, the basic mechanism can be extended to other countries and areas, such as South Korea, Taiwan, Hong Kong, Singapore, and India. These countries and regions are known to have both a gender imbalance and high savings rates.

Government Factors

An oft-cited government factor of different savings rates across countries is the extent and coverage of social safety net (Feldstein 1974; Guo and N'Diaye 2010; Chamon and Prasad 2008; Edwards 1996; Wen 2009; Hayashi 1986; Borsch-Supan

and Lusardi 2003; Ma and Yi 2010b). Generally, the more comprehensive a country's social safety net is, the less the need for the individual households to set aside resources for precautionary purposes. Feldstein contends that "the most obvious implication" of the life-cycle model is that social services reduces the amount of saving during the working years by providing income during retirement (1974, 907). Based on a sample of twelve major industrial countries in the first half of the 1970s, Feldstein (1980) found that higher levels of anticipated social security benefits do significantly reduce private saving. Using a large panel data set of about 70 countries over the time span from 1980 through 2007, Hung and Qian (2010) also have established a negative relationship between national savings rates and social safety nets. In this study, social safety net is measured as government social spending as a percentage of GDP, and government social spending includes expenditure on unemployment benefit, social security, healthcare, and education.

Political and Governmental Factors of Savings Rate

Despite the crucial importance of the market mechanism in modern society, governments have also become "providers of social services and income supplements, producers of goods, managers of the economy, and investors of capital" (Cameron 1978, 1243). Markets alone do not guarantee the development and provision of public goods. Facing "market failure," government is the only public organization that has the primary motivation and capacity to resolve collective action problems. Governance plays a significant role in economic development and savings. Haggard and Kaufman state that "institutional arrangements, including regime type, the government's role in organizing interest groups, and the internal structure of the

economic policy-making apparatus help to account for variations in policy choice, and thus for economic performance (1990, 211). Olson, Sarna, and Swamy (2000) also contend that governance is a major determinant of countries' economic performance. Olson, Sarna, and Swamy (2000) observe cross-country evidence that at the same time that most developing countries are growing slowly, a subset of developing countries has grown much faster than developed countries. For example, from 1985-95, the three fastest-growing countries were all developing countries (China, Korea, and Thailand) and they grew on average more than twelve times as fast as the three countries with the highest per capita incomes (Canada, Switzerland, and the U.S.). They argue that the striking fact is due to differences in the quality of governance, which is indicated as measures from International Country Risk Guide (ICRG): risk of expropriation, risk of repudiation, corruption in government, quality of bureaucracy, and rule of law. " It seems that besides the provision of a social safety net, there are many other political and governmental factors that might influence a country's national savings rate, such as political regime, political stability, regulatory quality, and control of corruption.

Political Regime

Research focusing on whether political regimes influence economic growth has produced three schools of thought (Feng 2003; Huntington 1987; Sirowy and Inkeles 1990). First, the "conflict school" argues that democracy hampers economic growth, especially in less developed countries. Second, the "compatibility school" claims that democracy enhances economic growth. The existence and exercise of fundamental civil liberties and political rights generate the social conditions most

conductive to economic development. Finally, the "skeptical school" contends that there is "no trade-off" between democracy and economic development (Przeworski et al. 2000, 178).

The "conflict school" argues that democratic regimes are unable to implement policies considered necessary to facilitate rapid growth. Huntington and Dominguez claim that "the interest of the voters generally leads parties to give the expansion of personal consumption a higher priority *via-a-vis* investment than it would receive in a non-democratic system" (1975, 60). In this view, democracy generates an explosion of demands for current consumption, which occurs at the cost of investment and growth. Democracy is thus seen as inimical to economic development. However, authoritarian regimes can facilitate rapid economic growth directly through a number of mechanisms, such as "their greater efficiency in the allocation of resources, their ability to use coercion to break traditional patterns, and their capacity to collectively organize and direct economic policies" (Sirowy and Inkeles 1990). Among these mechanisms, "the most frequently noted mechanism by which authoritarianism is thought to directly facilitate economic growth is through its effect on consumption and saving" (Sirowy and Inkeles 1990, 130). Economic growth needs capital accumulation. To maximize the rate of savings, a larger proportion of national income can be directed toward those who are already well-off since they generally have a higher marginal propensity to save. Due to the lack of a political accountability mechanism, authoritarian regimes can pursue policies that benefit a minority at the expense of the majority and thereby advance the accumulation of needed capital (Sirowy and Inkeles 1990). This school of thought accords well with the experiences

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of South Korea, Taiwan, and China, which grew rapidly under one-party

dictatorships. In this view, "the key to the superior economic performance of the

Asian 'tigers' is 'state autonomy,' defined as a combination of the 'capacity' of the

state to pursue developmentalist policies with its 'insulation' from particularistic

pressures, particularly those originating from large firms or unions" (Przeworski and

Limongi 1993, 56) . More specifically, "weak legislatures that limit the representative

role of parties, the corporatist organization of interest groups, and recourse to

coercion all expand a government's freedom of economic maneuver" (Haggard and

Moon 1990, 212). In summary, Vaman Rao states,

> Economic development is a process for which huge investments in
> personnel and material are required. Such investment programs imply
> cuts in current consumption that would be painful at the low levels of
> living that exist in almost all developing societies. Governments must
> resort to strong measures and they enforce them with an iron hand in
> order to marshall the surpluses needed for investment. If such
> measures were put to a popular vote, they would surely be defeated.
> No political party can hope to win a democratic election on a platform
> of current sacrifices for a "bright future" (1984, 74-75).

Political Stability

The level of political stability of a country also exerts an influence on its

savings rate. Political scientists have long been fascinated by the concept of political

stability (Goldsmith 1987). However, there is still a lack of consensus regarding its

concept formation and operationalization. Hurwitz (1973) identifies five commonly

used approaches to political stability. First, the absence of domestic civil conflict and

violent behavior. Second, governmental or cabinet longevity or duration. Third, the

existence of a legitimate constitutional regime. Fourth, the absence of structural

change. A system is regarded as stable if "it has been able to avoid changes in its

basic structural arrangement/ configuration over the years" (457). Finally, a multifaceted social attribute, for example, Eckstein (1966) argues that the concept of (democratic) political stability entails persistence of pattern (governmental endurance and having the capacity to adapt to changing conditions), legitimacy, effective decision-making, and authenticity.

According to Gurr, a "stable" political system is "one whose authority patterns remain similar over a long period of time" (1974, 1484). The most durable political systems are not only persistent, but also demonstrate a capacity to adapt gradually in response to internal and environmental stress, such as the English parliamentary democracy (Gurr 1974). Ake proposed a definition of political stability as "the regularity of the flow of political exchanges" (1975, 273). For Ake, political stability depends on the extent that members of society obey laws and conventions. Political stability is not the same as lack of change. "A political structure or part of it is changing considerably tells us nothing about its political stability" (Ake 1975, 280).

Is there a relationship between political stability and economic development? Przeworski et al. (2000) states that political instability can "divert resources and energies away from production and thus affect the contemporaneous growth of the economy. War is most prominent among them, but …other events of historical importance, such as regime transitions, will have immediate economic repercussions. Even less momentous political events, such as changes of heads of governments, may entail short-term economic adjustments" (188). Political instability is "likely to shorten policymakers' horizons leading to sub-optimal macroeconomic policies. It may also lead to a more frequent switch of policies, creating volatility and thus,

negatively affecting macroeconomic performance" (Aisen and Veiga 2013, 151). In contrast, Olson (1982) claims stable political institutions allow special interests to entrench their influence and to tear the economy apart with their distributional demands. Hence, "the effect of past political events on the current rhythm of development is an open question" (Przeworski et al. 2000, 189)

Using a sample of 49 noncommunist countries, Venieris and Gupta (1986) find that sociopolitical instability is a significant explanatory variable of savings and there is a negative relationship between savings and sociopolitical instability. Alesina and Perotti (1996) find that political instability has an adverse effect on investment and growth by estimating on a cross-section of 71 countries for the period 1960-1985. They measure political instability with indices that capture the occurrence of more or less violent phenomena of political unrest. Further, based on a panel dataset of 121 countries from 1950 to 1982, Londregan and Poole (1990) find a pronounced inverse relationship between economic development and the emergence of coup d'états, one extreme form of political instability. A high level of income or a high rate of economic growth dramatically inhibits coups. However, they find no evidence that either the recent history of coups or the current propensity for a coup d'état significantly affect the growth rate. Feng (1997) differentiates between three types of political instability: irregular government change (regime-level change); major regular (within-regime) government change; and minor regular (within-regime) government change. Regular and irregular government changes have different effects on economic growth. Irregular political changes such as coups d'état "instill great amounts of uncertainty into the market-place, slowing down and even reversing

economic growth" (Feng 1997, 397). However, major regular government changes, which take place within the framework of a nation's constitution, represent "a pattern of system adjustability and government accountability in favor of economic performance, and is thus likely to produce higher growth" (Feng 1997, 397). In the same vein, minor regulator government changes reflect "political adjustment rather than radical change," and may "provide the political stability necessary for economic growth and development" (Feng 1997, 397). Utilizing aggregate data covering ninety-six countries from 1960 to 1980, Feng confirms that major regular government change has a positive effect on growth and regime change has a negative effect on growth. Focusing on Israel since the start of the first Intifada (uprising), Fielding (2003) examined the relationship between political instability and savings rate. He contends that "one possible explanation for Israel's poor savings performance is the fact that over a long period it has suffered from high levels of political violence and threat of political instability" (Fielding 2003, 297). Fielding uses four indicators of political instability: fatalities in Israel proper (largely due to Palestinian attacks on Jewish civilians and Israeli security forces), fatalities in the West Bank and Gaza (largely Palestinian deaths during protests), the expansion rate of the West Bank and Gaza settlements, and the growth rate of the total number of immigrants coming into Israel. Both fatalities in Israel proper and fatalities in the West Bank and Gaza had a substantial negative impact on savings. In a more recent paper, Aisen and Veiga (2013) find that higher degrees of political instability are associated with lower growth rates of GDP per capita, using dynamic panel data models on a sample covering up to 169 countries for the period from 1960 to 2004. Their measure of

political instability is cabinet changes, that is, the number of times in a year in which

a new premier is named and/or 50 percent or more of the cabinet posts are occupied

by new ministers. An additional cabinet change per year reduces the annual real GDP

per capita growth rate by 2.39 percentage points.

Regulatory Quality

A country's regulatory quality also affects its economic performance and

savings rate. According to Reagan, regulation is

> A process of activity in which government requires or proscribes
> certain activities or behavior on the part of individuals and
> institutions, mostly private but sometimes public, and does so
> through a continuing administrative process, generally through
> specially designated regulatory agencies (1987, 15).

Regulation is political. It is an activity of government, involving values,

interests, conflicts, and the making of choices by persons concerned with

constituencies and elections. It can never be "a simple application of microeconomic

principles" (Reagan 1987). Regulation puts government and these regulated in an

adversarial relationship. It also involves the intrusion of government officials into

matters otherwise within the scope of managerial discretion. There are mainly two

types of regulation: economic regulation and social regulation. Economic regulation

focuses on the price of a product or service and the authority to enter or leave the

industry. Issues of health, safety, environmental protection, and social practices are

the main objects of social regulation.

The ability of the state to provide effective regulatory institutions is an

important determinant of how an economy performs. According to the Millennium

Challenge Corporation, improved regulatory quality promotes economic growth by

creating effective and efficient incentives for the private sector; burdensome

regulations have a negative impact on economic performance through economic

waste and decreased productivity. Using objective measures of business regulations

in 135 countries, Djankov, McLiesh, and Ramalho (2006) established a relationship

between the burden of business regulations and growth: countries with more

business-friendly regulations grow faster. Improving from the worst (first) to the best

(fourth) quartile of business regulations implies a 2.3 percentage point increase in

average annual growth. They use a new database of business regulations created by

the World Bank: the Doing Business database. The indicators measure how

regulations help or hinder economic performance in seven regulatory areas: starting a

business, hiring and firing workers, registering property, getting bank credit,

protecting equity investors, enforcing contracts in the courts, and closing a business.

Using the perceptions-based regulatory quality index from the World Bank's

Worldwide Governance Indicators, Jalilian, Kirkpatrick, and Parker (2007) explore

the role of regulation using an econometric model of the impact of regulation on

growth. The results suggest a strong causal link between regulatory quality and

economic performance.

Control of Corruption

Corruption retards economic growth and savings rate. Philp (2002) suggests

that political corruption includes the following components:

1. A public official (A),

2. In violation of the trust placed in him by the public (B),

3. And in a manner which harms the public interest,

4. Knowingly engages in conduct that exploits the office for clear personal and private gain in a way that runs contrary to the accepted rules and standards for the conduct of public office within the political culture,

5. So as to benefit a third party (C) by providing C with access to a good or service C would not otherwise obtain.

Nye (1967) proposes possible costs of corruption: waste of resources, instability, and reduction of governmental capacity. Economically, corruption may lead to capital outflow, investment distortions, waste of skills, and aid foregone. Alternatively, Nye also proposes possible benefits of corruption, such as capital formation and cutting red tape. However, he finally concludes that "we can refine the general statements about corruption and political development to read 'it is probable that the costs of corruption in less developed countries will exceed its benefits'" (1967, 427). Rose-Ackerman (1978) also contends that "those economists who look favorably upon corruption generally have a limited point of view, a narrow definition of goodness and an oversimplified model of the corrupt marketplace" (9). Moreover, Rose-Ackerman (1999) argues that corruption limits investment and growth, and developing countries are particularly at risk. She further suggests that corrupt officials have a higher discount rate compared to the rest of the population leading them to support projects with quick short-term payoffs and costs spread far into the future. Corrupt officials have a stronger preference for current consumption relative to the rest of the population. Klitgaard (1988) contends that corruption reallocates resources to the rich and powerful at the expense of the poor, the rural, and the disadvantaged.

Building on data for up to 70 countries for the period 1980-1983, Mauro (1995) shows that subjective indexes of corruption (Business International indices) are negatively linked with investment and economic growth. In the same fashion (using Corruption Perceptions Index from Transparency International), based on data for a panel of 53–100 countries over a ten-year period, Swaleheen (2008) presents evidence that corruption has a negative effect on the gross national savings rate. Using a sample covering bilateral investment from 12 source countries to 45 host countries, Wei (2000) reports evidence that corruption in host countries negatively affect their ability to attract foreign direct investment. Wei uses three measures of corruption: the Business International corruption measure, the corruption rating from the International Country Risk Group, and Corruption Perceptions Index from Transparency International. All of the three corruption measures are shown to retard the FDI.

CHAPTER 3: METHODOLOGY

Exploring the factors that drive savings rates, especially the high savings rate in China, is the primary focus of this study. To understand the most significant causes of this phenomenon, this dissertation uses a mixed-methods approach. First, a panel data study will be conducted to identify the reasons why different countries have different savings rates. Based on the literature review, a prediction model of national savings rate is developed, including income, growth rate, borrowing constraint, age dependency ratio, level of urbanization, social safety net, political system, political stability, regulatory quality, and control of corruption (Figure 3.1). Second, a comparison of China and Japan will be conducted. The variables found to be most significant in the quantitative study will be tested in China and Japan's situations. "The use of the mixed strategy helps to overcome potential sources of bias and to sort out spurious findings that might be produced in either SNA or LNA when carried out in isolation. The approach is particularly well suited to cross-national analysis, where investigators tend to be interested not only in general patterns… but also in the analysis of specific country cases" (Lieberman 2005, 450).

This chapter begins with a summary of the literature review, which leads to the research question and hypotheses of this dissertation. Then, it will outline the methods to test these hypotheses, including the research model, independent variables, dependent variable, control variables, data sources, and data analysis

Figure 3.1 A Prediction Model of National Savings rate
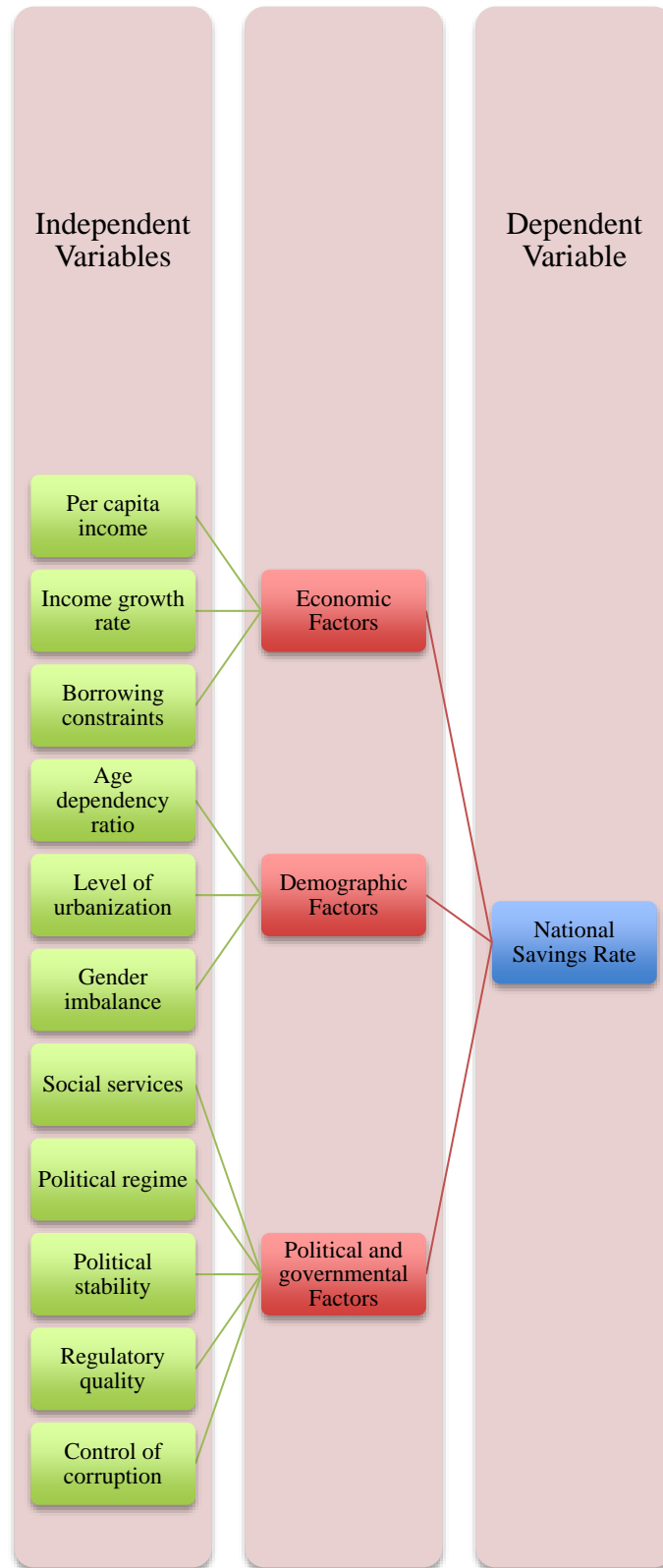
techniques. Moreover, it will also explain why the methods chosen are appropriate for studying this research question.

<div align="center">**Research Question and Hypotheses**</div>

The research question of this dissertation is: Why is China's savings rate so high? To understand this, we need first to identify what are the determinants of savings rate. That is, why different countries have different savings rates? Based on the literature review, I hypothesize that the following factors determine savings rates.

Economic Factors

H1: The higher a country's per-capita income, the higher the national savings rate is likely to be.

In the standard Keynesian economic model, saving money is considered to be a positive function of income: as income rises, the rate of saving increases. In many empirical studies, researchers have found that the level of real per capita income positively affects savings rates (Carroll and Weil 1994; Edwards 1995; Loayza, Schmidt-Hebbel, and Servén 2000b; Schmidt-Hebbel, Webb, and Corsetti 1992).

H2: The higher a country's growth rate, the higher the national savings rate is likely to be.

Departing from Keynes's contention of a greater proportion of income being saved as real income increases, Modigliani (1954) claimed instead that the proportion of income saved is essentially independent of income. What matters is the long-term rate of income growth. The higher a country's growth rate, the higher the national savings rate is likely to be.

H3: The more stringent a country's borrowing constraint, the higher the

national savings rate is likely to be.

Borrowing constraint exerts an influence on a country's savings rate. With limited access to credit, individuals and enterprises have to resort to savings. I hypothesize that there is a positive relationship between a country's borrowing constraints and its savings rates.

Demographic Factors

H4: The higher a country's age-dependency ratio, the lower the national

savings rate is likely to be.

Over the life cycle, according to Modigliani, saving follows hump-shaped patterns, with dissaving until early adult age, the peak of saving at mid-life, and dissaving during retirement as households run down their retirement assets. The age dependency ratio is predicted to negatively influence national savings rate.

H5: The higher a country's level of urbanization, the lower the national

savings rate is likely to be.

Level of urbanization can be a determinant of a country's savings rate. With limited choices on commodities and services, rural residents depending heavily on agricultural income, tend to save a larger share of their income. Level of urbanization is predicted to have a negative relationship with national savings rate.

 H6: The higher a country's percentage of female population in the total

population, the lower the national savings rate is likely to be.

According to the competitive motive model, facing the reality of a scarcity of women in the marriage market, Chinese parents with sons increase their savings in a

competitive manner to enhance their son's relative attractiveness for marriage (Wei and Zhang 2011). Moreover, Wei and Zhang (2011) contend that the mechanism can be extended to other countries and areas. Following this line of reasoning, I hypothesize that there is a negative relationship between a country's percentage of female population and its national savings rate.

Political and Governmental Factors

H7: The more comprehensive a country's social services, the lower the

national savings rate is likely to be.

Many studies show that social safety net reduces the need for individual households to set aside resources for precautionary purposes (Feldstein 1980; Hung and Qian 2010). It is predicted that there is a negative relationship between the coverage of a country's social safety net and its national savings rate.

H8: The more democratic a country is, the lower the national savings rate is

likely to be.

Democratic regimes generally put a higher priority on consumption to cater to the interests of voters (Huntington and Dominguez 1975). However, authoritarian regimes can wield the power to pursue necessary policies to advance capital accumulation for economic growth. It is predicted that authoritarian countries have higher savings rates than democratic countries.

H9: The higher the level of political stability in a country, the higher the

national savings rate is likely to be.

Several empirical studies show that there is a negative relationship between political instability and savings rate (or economic development) (Fielding 2003; Feng

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1997; Londregan and Poole 1990). Political stability is predicted to have a positive impact on national savings rate

> H10: The higher the regulatory quality in a country, the higher the national
>
> savings rate is likely to be.

Multiple empirical studies present evidences that government regulation exert an influence on savings rate (Jalilian, Kirkpatrick, and Parker 2007; Bayoumi 1993; Ang and Sen 2011). The higher the regulatory quality in a country, the higher the national savings rate is likely to be.

> H11: The more effective the control of corruption in a country, the higher the
>
> national savings rate is likely to be.

Corruption hampers economic growth and decreases savings rate. It is predicted that there is a positive relationship between a country's level of corruption control and its savings rate.

A Panel Data Study

A Model of National Savings Rate

Based on the literature review, a model of savings rate is developed, where saving is a function of income, growth rate, borrowing constraint, age dependency ratio, level of urbanization, social safety net, political system, political stability, regulatory quality, and control of corruption (Figure 3.1).

Dependent Variable. The dependent variable is savings rate. It is operationalized as a country's gross national savings rate: the percentage of gross savings in gross national income. Gross savings are calculated as gross national income less total consumption, plus net transfers. The national savings rate is used

because data on household savings are much more limited. Many developed countries have data on household savings. For example, the Organization for Economic Cooperation and Development (OECD) reported annual household savings rate for its member countries since 1995. However, even when private or household data are available, they may have limited use because of lack of comparability across countries (Collins 1991) . The advantage of using national savings rates is that more years of data are available for more countries. Moreover, household saving is a large and predominant part of national saving (Chamon 2010; Bardhan 2010).

Independent Variables. Independent variables in this study mainly include three groups of factors: economic factors, demographic factors, and political and governmental factors. Economic factors include income, growth rate, and borrowing constraints. In this study, income is operationalized as GDP per capita in constant U.S. dollars for the year 2000. Income growth rates are measured as annual growth rates in GDP. Borrowing constraint is measured by the percentage of domestic credit in GDP.

Demographic factors include age dependency ratio, level of urbanization, and the percentage of female population. Age dependency ratio is measured as the ratio of dependents (people younger than 15 years old or older than 64 years old) to the working-age population (those ages 15-64). Ranging from 0-100percent, the level of urbanization is measured as the proportion of the population living in urban areas. Gender ratio is measured as the percentage of the population that is female (0-100percent).

Political and governmental factors include social safety net, political regime, political stability, regulatory quality, and control of corruption. Social safety net is measured as the proportion of public health expenditure in total health expenditure (0-100percent). Political regime ranges from +10 (strongly democratic) to -10 (strongly autocratic). According to the World Bank's Worldwide Governance Indicators, political stability reflects "perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including politically-motivated violence and terrorism." It ranges from approximately -2.5 (unstable) to 2.5 (stable). As to Regulatory quality, this study uses the Heritage Foundation's regulatory efficiency index, which combines business freedom, labor freedom, and monetary freedom. The regulatory efficiency score for each country is a number between 0 and 100, with 100 equaling the most efficient regulation. In the World Bank's Worldwide Governance Indicators, control of corruption reflects "perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as 'capture' of the state by elites and private interests". It ranges from approximately -2.5 (least effective) to 2.5 (most effective)

Control Variables. Two control variables are included in this study: Region and population density. To control for regional differences, a control variable of region will be included. Savings rates display great variation across regions and countries. There is especially a saving divergence across developing regions over the last four decades: "Savings rates have risen steadily in East Asia, stagnated in Latin America, and fallen in sub-Saharan Africa" (Loayza, Schmidt-Hebbel, and Servén 2000b, 165). This study follows the World Bank's classification, which includes 7

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geographic regions: Europe and Central Asia, Middle East and North Africa, South

Asia, Latin America and Caribbean, Sub-Saharan Africa, North America, and East

Asia and Pacific. In addition, population density might be one of the factors that

influence savings rate. In this dissertation, population density is midyear population

divided by land area in square kilometers.

Data Sources

The data set for the panel data study primarily draws from the World Bank's

World Development Indicators (WDI). WDI is a reliable secondary data source.

Compiled from officially-recognized international sources, WDI presents the most

current, high-quality, internationally comparable global development data available.

WDI data are presented by country, by topic, and by indicator. For this study, WDI

provides data on income, growth rate, borrowing constraints, age dependency ratio,

urbanization, population density, and regions.

For the measure of political regime, I will use data from Polity IV Project, a

data set providing annual time series data in country-year format covering all major,

independent states from 1800 to 2010. It is the most widely used data resource for

studying regime change and the effects of regime authority.

To assess the influence of governance on savings rate, World Bank

Worldwide Governance Indicators will be used. The Worldwide Governance

Indicators reports aggregate and individual governance indicators for 215 economies

over the period 1996–2011. The indicators are constructed from hundreds of existing

perception indicators derived from 37 different data sources produced by 31 different

organizations, including the ICRG, Freedom House, and Transparency International.

According to OECD, it is the "most carefully constructed and widely used governance indicators today" (Arndt and Oman 2006, 13). Two indicators will be used in this study, including political stability and absence of violence and control of corruption.

For the measure of regulatory quality, the Index of Economic Freedom of Heritage Foundation will be used. With four categories (rule of law, limited government, regulatory efficiency, and open markets), the Index provides an objective tool for analyzing 186 economies throughout the world between 1995 and 2004. In this study, I will use data on regulatory efficiency. Regulatory efficiency includes three aspects: business freedom, labor freedom, and monetary freedom. Business freedom measures a country's ability to start, operate, and close business and represents the overall burden of regulation as well as the efficiency of government in the regulatory process. The labor freedom component is a quantitative measure that looks into various aspects of the legal and regulatory framework of a country's labor market. It provides cross-country data on regulations concerning minimum wages; laws inhibiting layoffs; severance requirements; and measurable regulatory burdens on hiring, hours, and so on. Monetary freedom combines a measure of price stability with an assessment of price controls. Both inflation and price controls distort market activity. Price stability without microeconomic intervention is the ideal state for the free market. [6] Table 3.1 reports all variables' definitions, indicators, sources, and predicted relationship with the dependent variable.

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[6] Regulatory efficiency from The Index of Economic Freedom.
http://www.heritage.org/index/regulatory-efficiency

Table 3.1 Variables' Indicators, Sources, and Predicted Relationship with the Dependent Variable

	Variables	Indicators	Sources	Predicted Sign
DV	Gross national savings rate (*SRT*)	Gross savings (percent of Gross National Income). Gross savings are calculated as gross national income less total consumption, plus net transfers.	World Bank World Development Indicator (WDI)	
IV: Economic Factors	Income (*RGDP*)	Real GDP per capita (constant 2000 US dollars). GDP per capita is gross domestic product divided by midyear population. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products.	World Bank World Development Indicator (WDI)	+
	GDP growth rate (*GDPGR*)	Annual percentage growth rate of GDP at market prices based on constant local currency. Aggregates are based on constant 2000 U.S. dollars.	World Bank World Development Indicator (WDI)	+
	Borrowing constraints (*CREDIT*)	Domestic credit: the percent share of domestic credit of GDP. Domestic credit includes all credit to various sectors on a gross basis, with the exception of credit to the central government, which is net. The banking sector includes monetary authorities and deposit money banks, as well as other banking institutions where data are available (including institutions that do not accept transferable deposits but do incur such liabilities as time and savings deposits). Examples of other banking institutions are savings and mortgage loan institutions and building and loan associations.	World Bank World Development Indicator (WDI)	+
IV: Demographic Factors	The level of urbanization (*URB*)	The percentage of urban population in total population. Urban population refers to people living in urban areas as defined by national statistical offices. It is calculated using World Bank population estimates and urban ratios from the United Nations World Urbanization Prospects.	World Bank World Development Indicator (WDI)	–
	Age dependency ratio (*ADRAT*)	Age dependency ratio is the ratio of dependents--people younger than 15 or older than 64--to the working-age population--those ages 15-64. Data are shown as the proportion of dependents per 100 working-age population.	World Bank World Development Indicator (WDI)	–
	The percentage of female population (*FEPOP*)	The percentage of the population that is female.	World Bank World Development Indicator (WDI)	–

	Variables	Indicators	Sources	Predicted Sign
IV: Political and Governmental Factors	Social safety net (*SSN*)	Health expenditure, public (percent of total health expenditure). Public health expenditure consists of recurrent and capital spending from government (central and local) budgets, external borrowings and grants (including donations from international agencies and nongovernmental organizations), and social (or compulsory) health insurance funds. Total health expenditure is the sum of public and private health expenditure. It covers the provision of health services (preventive and curative), family planning activities, nutrition activities, and emergency aid designated for health but does not include provision of water and sanitation.	World Bank World Development Indicator (WDI)	–
	Political regime (*POLISYS*)	POLITY2 from the Polity IV Project. POLITY2 is a modified version of the POLITY variable created in order to facilitate the use of the POLITY regime measure in time-series analyses. The POLITY score is computed by subtracting the AUTOC (autocracy, 0-10) score from the DEMOC (democracy, 0-10) score. In mature form, autocracies sharply restrict or suppress competitive political participation. Their chief executives are chosen in a regularized process of selection within the political elite, and once in office they exercise power with few institutional constraints. Democracy is conceived as three essential, interdependent elements. One is the presence of institutions and procedures through which citizens can express effective preferences about alternative policies and leaders. Second is the existence of institutionalized constraints on the exercise of power by the executive. Third is the guarantee of civil liberties to all citizens in their daily lives and in acts of political participation. Polity2 ranges from +10 (strongly democratic) to -10 (strongly autocratic).	Polity IV Project	–
	Political Stability (*POLISTA*)	It reflects perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including politically-motivated violence and terrorism. It ranges from approximately -2.5 (weak) to 2.5 (strong).	Worldwide Governance Indicators	+
	Regulatory quality (*REGUEFF*)	Regulatory efficiency. Regulatory efficiency includes business freedom, labor freedom, and monetary freedom. A country's overall score in regulation efficiency is derived by averaging these three economic freedoms, with equal	Index of Economic Freedom	+

Variables		Indicators	Sources	Predicted Sign
		weight being given to each. The regulatory efficiency score for each country is a number between 0 and 100, with 100 equaling the most efficient regulation. Business freedom is a quantitative measure of the ability to start, operate, and close a business that represents the overall burden of regulation as well as the efficiency of government in the regulatory process. The labor freedom component is a quantitative measure that looks into various aspects of the legal and regulatory framework of a country's labor market. It provides cross-country data on regulations concerning minimum wages; laws inhibiting layoffs; severance requirements; and measurable regulatory burdens on hiring, hours, and so on. Monetary freedom combines a measure of price stability with an assessment of price controls. Both inflation and price controls distort market activity. Price stability without microeconomic intervention is the ideal state for the free market.		
	Control of corruption (*CTRLCORR*)	It reflects perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests. It ranges from approximately -2.5 (weak) to 2.5 (strong).	Worldwide Governance Indicators	+
Control Variables	Population density (*POPDNST*)	Population density (people per sq. km of land area).	World Bank World Development Indicator (WDI)	
	Region (*REGION*)	1=Europe & Central Asia 2=Middle East & North Africa 3=South Asia 4=Latin America & Caribbean 5=Sub-Saharan Africa 6=North America 7=East Asia & Pacific	World Bank World Development Indicator (WDI)	

Advantages of Panel Data

Combining time series of cross-section observations, panel data have multiple advantages over pure time-series or pure cross-section data. There are mainly three types of data available for empirical analysis: time series, cross-section, and pooled (i.e., combination of time series and cross-section) data (Gujarati 2004). In time series data, we observe the values of one or more variables over a period of time, for example, GDP from 1980 to 2000. Cross-section data are data on one or more variables collected at the same point in time, such as the census of population conducted by the Census Bureau every ten years. In pooled data are elements of both time series and cross-section data. Panel data are a special type of pooled data in which the same cross-sectional unit (a family or a firm or a state) is surveyed over time.

Compared with time-series or cross-section data, first, panel data allow controlling for individual unobserved heterogeneity. Individuals, firms, countries are heterogeneous. Studies that do not control this heterogeneity run the risk of obtaining biased results. Since unobserved heterogeneity is the main problem of non-experimental research, this benefit is especially useful. Second, panel data give "more informative data, more variability, less collinearity among the variables, more degrees of freedom and more efficiency" (Baltagi 2005, 5). According to Eom, Lee, and Xu (2007), "the fundamental advantage of using panel data", compared with cross-sectional data, "lies in its efficacy allowing researchers to examine the cause-and-effect relationship using before-and-after observations" (579). Analysis with cross-sectional data can only examine the relationships at a single point of time, so "it is

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hard to identify which variable 'affects' others because it lacks the time dimension that is one of the essential components for causal relationship" (Eom, Lee, and Xu 2007, 579). Moreover, "studying the repeated cross section of observations, panel data are better suited to study the dynamics of change" (Gujarati 2004, 638). Take unemployment for example, cross-sectional data can estimate what proportion of the population is unemployed at a point in time. Repeated cross-sections can show how this proportion changes over time. However, only panel data can tell what proportion of those who are unemployed in one period can remain unemployed in another period (Baltagi 2005). Overall, panel data enhance the quality and quantity of data and are suited to track changes in savings rates in different countries.

Sample

Based on data availability, 91 countries (see Table 3.2) and a period from 1980 to 2010 are selected. For political stability, regulatory quality, and control of corruption, there are only data for years of 1996, 1998, 2000, 2002-2010. These 91 countries include 27 high-income countries, 25 upper-middle-income countries, 25 lower-middle-income countries, and 14 low-income countries. [7]

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[7] According to the World Bank, countries are categorized by income into four groups: low income, $1,025 or less; lower middle income, $1,026 - $4,035; upper middle income, $4,036 - $12,475; and high income, $12,476 or more. Economies are divided according to 2011 GNI per capita, calculated using the World Bank Atlas method (http://data.worldbank.org/about/country-classifications).

Table 3.2 Countries Classified by Income

	High Income (>=$12,476)	Upper Middle Income ($4,036 - $12,475)	Lower Middle Income ($1,026 - $4,035)	Low Income (<=$1,025)
Countries	Cyprus Kuwait Saudi Arabia Singapore Austria Belgium Canada Denmark Finland France Germany Greece Hungary Ireland Israel Italy Japan Korea, Rep. Netherlands New Zealand Norway Portugal Spain Sweden Switzerland United Kingdom United States	Algeria Botswana Brazil Bulgaria Chile China Colombia Costa Rica Dominican Republic Ecuador Gabon Jordan Latvia Malaysia Mauritius Mexico Namibia Panama Peru South Africa Thailand Tunisia Turkey Uruguay Venezuela, RB	Albania Bolivia Congo, Rep. Egypt, Arab Rep. El Salvador Georgia Ghana Guatemala Guyana Honduras India Indonesia Lesotho Morocco Nicaragua Pakistan Papua New Guinea Paraguay Philippines Senegal Sri Lanka Sudan Swaziland Syrian Arab Republic Zambia	Bangladesh Central African Republic Comoros Congo, Dem. Rep. Gambia, The Kenya Madagascar Malawi Mauritania Mozambique Nepal Rwanda Sierra Leone Zimbabwe
Total	27	25	25	14

Analysis Techniques

  The two most widely used techniques for panel data analysis—fixed effects model and random effects model —will be employed in this study. First, a fixed effects model (Model 1) will be applied. Then a random effects model (Model 2) will be employed. The fixed effects model assumes that unobserved heterogeneity is correlated with explanatory variables; the random effects model does not. The random effects model assumes that the unobservable country-specific effect is "a random disturbance that is distributed independently of the idiosyncratic or 'remainder' disturbance that varies over time as well as across countries" (Elbahnasawy and Revier 2012, 320).

  To choose between the random effects model and the fixed effects model, the Hausman test will be employed. The Hausman test compares the fixed versus random effects under the null hypothesis that the individual effects are independent of the other explanatory variables in the model (Baltagi 2005; Greene 2011). If the null hypothesis is rejected, then it is preferred to use fixed effects because it produces more efficient estimators. On the other hand, if it is not rejected, the random effects model is better.

  Besides fixed effects model and random effects model, the Hausman-Taylor estimator will also be employed. As mentioned above, the random effects model generally assumes exogeneity of all the regressors and the random individual effects, whereas fixed effects model allows for endogeneity of all the regressors and the individual effects. "This *all or nothing* choice of correlation between the individual effects and the regressors prompted Hausman and Taylor to propose a model where

some of the regressors are correlated with the individual effects" (Baltagi, Bresson, and Pirotte 2003, 361). In the Hausman-Taylor model, while some of the independent variables can be regarded as exogenous, some other independent variables can be considered as endogenous. The equations for the three models are as follows:

$$\begin{aligned}
SRT_{it} = {} & b_0 + b_1 RGDP_{it} + b_2 GDPGR_{it} + b_3 CREDIT_{it} + b_4 ADRAT_{it} + b_5 URB_{it} + b_6 FEPOP_{it} \\
& + b_7 SSN_{it} + b_8 POLISYS_{it} + b_9 POLISTA_{it} + b_{10} REGUEFF_{it} + b_{11} CTRLCORR_{it} \quad (3.1) \\
& + b_{12} POPDNST_{it} + b_{13} REGION_i + a_i + u_{it}
\end{aligned}$$

$$\begin{aligned}
SRT_{it} = {} & b_0 + b_1 RGDP_{it} + b_2 GDPGR_{it} + b_3 CREDIT_{it} + b_4 ADRAT_{it} + b_5 URB_{it} + b_6 FEPOP_{it} \\
& + b_7 SSN_{it} + b_8 POLISYS_{it} + b_9 POLISTA_{it} + b_{10} REGUEFF_{it} + b_{11} CTRLCORR_{it} \quad (3.2) \\
& + b_{12} POPDNST_{it} + b_{13} REGION_i + v_{it}
\end{aligned}$$

$$\begin{aligned}
SRT_{it} = {} & b_0 + b_1 RGDP_{it} + b_2 GDPGR_{it} + b_3 CREDIT_{it} + b_4 ADRAT_{it} \\
& + b_5 FEPOP_{it} + b_6 SSN_{it} + b_7 REGUEFF_{it} + b_8 POPDNST_{it} \quad (3.3) \\
& + z_1 URB_{it} + z_2 POLISYS + z_3 POLISTA_{it} + z_4 CTRLCORR_{it} \\
& + a\,REGION_i + v_{it}
\end{aligned}$$

Where:

SRT_{it} : Gross savings rate (percent of Gross National Income).

$RGDP_{it}$: Real GDP per capita (constant 2000 US$).

$GDPGR_{it}$: GDP growth rate (annual percent).

$CREDIT_{it}$: The percent share of domestic credit of GDP.

$ADRAT_{it}$: Age dependency ratio.

URB_{it} : The percentage of urban population in total population.

$FEPOP_{it}$: The percentage of female population in total population.

SSN_{it} : Social safety net.

$POLISYS_{it}$: Political system.

$POLISTA_{it}$: Political stability and absence of violence.

$REGU_{it}$: Regulatory quality.

$CTRLCORR_{it}$: Control of corruption.

$POPDNST_{it}$: Population density.

$REGION_i$: Region.

a_i : Unobserved heterogeneity/effect.

u_{it} : Idiosyncratic error/time-varying error.

v_{it} : Composite error term.

A Comparison of China and Japan

The Disadvantages of Panel Data Methods

Panel data methods also have weaknesses. According to Janoski and Hicks (1993), with many countries in a panel data study, it is hard to know the intimate details of each case. Second, panel data studies tend, in contrast with time-series studies, to reduce the explanation to a single cross-nationally homogenous set of variables and parameters. A comparison focused on China and Japan can complement the weaknesses of the panel data study.

Why China and Japan?

China and Japan are two Asian powers that have many commonalities such as a long history, a partly shared culture, an export-oriented development policy, and the central role of government in economic activities. As to savings rate, both of China's and Japan's savings rates are higher than the savings rates of most countries in other regions. Japan had one of the highest savings rates in the world in the 1960s and

1970s. According to Sato, " if the saving ratio had not increased rapidly after World War II, Japan's remarkable postwar economic growth could not have been achieved" (1987, 140). Specifically, the Japanese postal savings fund has played a key role in mobilizing Japanese domestic savings (Calder 1990). However, China's savings rate became higher than Japan's savings rate since the 1980s. With these two cases, China and Japan, a most similar system will be built to uncover the root causes of China's high savings rate. Why is China's savings rate higher than Japan's savings rate since they have so many similarities? Why did their savings rates diverge since the 1980s (especially after 2000)? What differences lead to their differences in savings rates? The findings of the panel data study will be applied into China and Japan's situations.

In addition, China savings rates will be analyzed by the components of aggregate savings: corporate, household and government savings. While it is well-known that China's national savings are quite high, it is "less well-known who saves" (Kujis 2006, 6). This decomposition can also underline " the changing role of the government and households over the course of China's economic reforms" (Kraay 2000, 548). The breakdown of national savings into three parts helps us have a better understanding of major sources and changes of savings over time.

In addition, the data for the comparison between China and Japan come from government documents, archival records, newspapers, and other sources. Government documents can be used to trace policies that are related to savings rate. They include reports from Chinese National Development and Reform Commission, Chinese Ministry of Commerce, Chinese Ministry of Human Resources and Social Security. These documents can be accessed online. Newspapers like *Asahi Shimbun*, *Yomiuri*

Shimbun, *China Daily*, and *Nanfangzhoumo* (*Southern Weekly*) will also be useful sources. In addition, some international organizations' reports on savings and consumption will also be used, for example, Mckinsey Global Institute's study of Chinese consumer: *If you've got it, spend it: Unleashing the Chinese consumer.*

In sum**,** this dissertation uses a mixed-methods approach: a panel data study and a comparison of China and Japan. This study adds to the current literature by utilizing a newer and larger panel data of 91 countries over the time span from 1980 through 2010 (Hung and Qian 2010; Loayza, Schmidt-Hebbel, and Servén 2000b). In addition, several new political and governmental variables—regime types, political stability, regulatory quality, and control of corruption—are added to explore the effects of governance on savings rates.

CHAP 4 RESULTS OF THE PANEL DATA STUDY

This chapter reports the results of the panel data models. First, descriptive statistics and a correlation matrix of the variables will be presented. Then I will provide the results of five panel data specifications: a fixed effects model without political and governmental variables (Model 1), a random effects model without political and governmental variables (Model 2), a fixed effects model including political and governmental variables (Model 3), a random effects model with political and governmental variables (Model 4), and a Hausman-Taylor estimation with all the variables. The dependent variable in all the models is gross national savings rate. The explanatory variables include:

1. Economic variables: Real GDP per capita, GDP growth rate, and domestic credit;

2. Demographic variables: Urbanization level, age dependency ratio, and female ratio.

3. Political and governmental variables: regime type, political stability, the extent and coverage of social safety net, regulatory efficiency, and level of corruption control.

Moreover, in order to control for regional differences and population density, two control variables are included: Region and population density.

Descriptive Statistics

Table 4.1 presents the summary statistics of the variables included in the sample, which combines World Bank World Development Indicators, World Bank Worldwide Governance Indicators, Polity IV project, and the Index of Economic Freedom of the Heritage Foundation. Among the countries included in the sample, the average national savings rate is 17.681 percent from 1980 to 2010, ranging from -84.07 percent (Lesotho, 1983) to 60.63 percent (Gabon, 1980). Countries with extreme values of gross national savings rates are also tabulated in Table 4.2. For example, China is always among the top ten countries that have the highest savings rates (except in year 1980, when China's economic reform began). In 2012, China's national savings rate reached 51.43 percent, and ranked the first among 200 countries and regions all over the world. In contrast, Afghanistan's savings ratio is -14.90 percent at the same year. In 2010, whereas China's national savings rate is 52.46

Table 4.1 Summary Statistics

Variables	Obs	Mean	Std. Dev.	Min	Max
Gross national savings rate	3211	17.68	14.47	-84.41	60.63
Real GDP per capita	3187	7144.99	9736.90	82.67	56388.99
GDP growth rate	3207	3.28	4.72	-50.25	35.22
Domestic credit	3091	66.71	52.75	-72.99	333.99
Urbanization level	3224	53.69	23.03	4.70	100.00
Age dependency ratio	3097	68.26	18.23	35.89	112.77
The percentage of women	3100	50.22	1.42	39.98	54.10
Public health expenditure	3213	16.34	6.45	2.05	76.22
Political system	1092	5.11	5.79	-10.00	10.00
Political stability	1092	-0.13	0.95	-2.99	1.67
Regulatory efficiency	1050	69.27	11.19	26.07	96.53
Control of corruption	1092	0.15	1.07	-2.06	2.59
Population density	3181	177.93	547.07	1.23	7250.00
Region	3224	3.45	1.94	1	7

percent, the number of the U.S. is only 15.01 percent, ranking as the fifth lowest-savings-rate countries.

In terms of real GDP per capita (Table 4.1), the mean is 7,144.99 in constant U.S. dollars. There is a large variation among these countries as indicated by the range (56,306.32) and the standard deviation (9,736.90). So the mean may not be a good indicator for real GDP per capita in the sample countries.

The average GDP growth rate for all the countries in the sample is 3.28 percent between 1980 and 2010. Coincidentally, both of the highest (35.22 percent in 1995) and the lowest (-50.25 percent in 1994) growth rates belong to Rwanda. This is mainly because of Rwanda's economy suffered heavily during the 1994 Rwandan Genocide, but has since strengthened. In addition, average GDP growth rate by countries is also listed in Table 4.3. From 1980 to 2010, China's average GDP growth rate is the highest: 10.02 percent. Botswana, Singapore, India, South Korea, Malaysia, Thailand, Indonesia, Pakistan and Egypt are also among the fastest growing countries.

During the period of 1980-2010, on average, domestic credit takes up 66.71 percent of GDP. And the average urbanization ratio is 53.69 percent. The least urbanized country is Rwanda in 1980, and only 4.7 percent of Rwandan population lives in urban area. The most urbanized country is Singapore; its urbanization level has reached 100 percent since 1980.

The mean of age dependency ratio is 68.26 percent, indicating that the ratio of younger dependents (people younger than 15 years old) and older dependents (people older than 64) to the working-age population (those ages 15-64) is 68.26 in those

countries. The lowest age dependency ratio is from 2010's Singapore (35.89 percent).

And the highest number comes from 1980's Kenya (112.77 percent), meaning that

Kenya had much more non-working population than working population at that time.

Table 4.2 Top and Bottom Ten Countries/Regions in Gross National Savings Rate

Year	Ranking	Highest		Lowest	
		Country	Savings Rate	Country	Savings Rate
2012	1	China	51.43	Afghanistan	-14.90
	2	Algeria	47.99	Grenada	-10.72
	3	Singapore	46.11	St. Vincent and the Grenadines	-6.79
	4	Azerbaijan	45.55	Montenegro	-0.20
	5	Nigeria	44.39	Tonga	5.70
	6	Botswana	40.82	Jamaica	8.53
	7	Nepal	40.38	Jordan	8.54
	8	Norway	38.32	Bahamas, The	9.02
	9	Bangladesh	36.25	El Salvador	9.26
	10	Mongolia	35.64	Kenya	9.42
2010	1	Timor-Leste	67.49	Kenya	14.33
	2	Macao SAR, China	62.74	Bosnia and Herzegovina	14.35
	3	China	52.46	Guyana	14.43
	4	Algeria	50.07	Bahamas, The	14.57
	5	Azerbaijan	49.32	United States	15.01
	6	Kuwait	49.29	Ghana	15.09
	7	Singapore	48.27	Mauritius	15.35
	8	Bhutan	45.74	Paraguay	16.21
	9	Saudi Arabia	42.84	Ireland	16.27
	10	Nepal	37.56	New Zealand	16.45

Table 4.2 Top and Bottom Ten Countries/Regions in Gross National Savings Rate (Continued)

Year	Ranking	Highest Country	Savings Rate	Lowest Country	Savings Rate
2000	1	Gabon	49.22	El Salvador	13.92
	2	Singapore	44.52	Nicaragua	14.03
	3	Congo, Rep.	43.24	Senegal	14.08
	4	Kuwait	42.09	Paraguay	14.26
	5	Botswana	41.48	Brazil	14.36
	6	Malaysia	39.09	Cambodia	14.42
	7	Iran, Islamic Rep.	38.73	Greece	14.43
	8	China	37.29	Uganda	14.61
	9	Russian Federation	37.12	United Kingdom	14.73
	10	Maldives	36.82	Cyprus	15.56
1996	1	Angola	98.96	Moldova	12.75
	2	Singapore	49.39	Mali	12.87
	3	Turkmenistan	49.17	Swaziland	12.90
	4	Gabon	46.72	Bolivia	12.95
	5	Maldives	46.31	Macedonia, FYR	13.56
	6	China	41.90	El Salvador	13.69
	7	Iran, Islamic Rep.	41.79	Uruguay	14.27
	8	Botswana	40.74	Brazil	14.29
	9	Malaysia	38.85	Rwanda	14.36
	10	Bahamas, The	36.12	Malta	14.75

Table 4.2 Top and Bottom Ten Countries/Regions in Gross National Savings Rate (Continued)

		Highest		Lowest	
Year	Ranking	Country	Savings Rate	Country	Savings Rate
1990	1	Singapore	43.38	Benin	9.88
	2	Botswana	42.84	Bolivia	10.21
	3	Lesotho	42.11	Nepal	10.30
	4	China	39.39	Tanzania	10.55
	5	Yemen, Rep.	38.80	Ghana	10.74
	6	Congo, Rep.	38.26	Guatemala	10.94
	7	Korea, Rep.	36.83	Central African Republic	11.05
	8	Bahamas, The	35.49	Angola	11.25
	9	Kiribati	35.39	Rwanda	11.38
	10	Namibia	34.29	Costa Rica	12.01
1980	1	Kuwait	59.34	Mozambique	-6.56
	2	Bahrain	56.09	Nicaragua	-2.47
	3	Gabon	53.09	Madagascar	-0.74
	4	Saudi Arabia	53.07	Comoros	-0.36
	5	Jordan	43.39	Central African Republic	1.60
	6	Algeria	42.15	Uganda	1.91
	7	Oman	40.39	Senegal	2.80
	8	Bulgaria	38.33	Sierra Leone	3.00
	9	Trinidad and Tobago	38.28	Benin	4.18
	10	Suriname	37.97	Sudan	4.52

Source: World Bank World Development Indicators

Table 4.3 GDP Growth Rate by Countries (1980-2010)

Rank	Country	Average GDP Growth Rate	Income Group
1	China	10.02	Upper middle income
2	Botswana	7.11	Upper middle income
3	Singapore	7.01	High income: nonOECD
4	India	6.26	Lower middle income
5	Korea, Rep.	6.11	High income: OECD
6	Malaysia	6.02	Upper middle income
7	Thailand	5.62	Upper middle income
8	Indonesia	5.46	Lower middle income
9	Pakistan	5.13	Lower middle income
10	Egypt, Arab Rep.	5.05	Lower middle income
11	Swaziland	4.99	Lower middle income
12	Jordan	4.98	Upper middle income
13	Sri Lanka	4.91	Lower middle income
14	Sudan	4.84	Lower middle income
15	Chile	4.83	High income: OECD
16	Dominican Republic	4.74	Upper middle income
17	Mozambique	4.67	Low income
18	Bangladesh	4.66	Low income
19	Mauritius	4.57	Upper middle income
20	Cyprus	4.47	High income: nonOECD
21	Rwanda	4.42	Low income
22	Syrian Arab Republic	4.42	Lower middle income
23	St. Lucia	4.41	Upper middle income
24	Tunisia	4.39	Upper middle income
25	Ireland	4.38	High income: OECD
26	Nepal	4.34	Low income
27	Israel	4.28	High income: OECD
28	Antigua and Barbuda	4.24	High income: nonOECD
29	Congo, Rep.	4.22	Lower middle income
30	Luxembourg	4.17	High income: OECD
31	St. Kitts and Nevis	4.14	High income: nonOECD
32	Panama	4.13	Upper middle income
33	Turkey	4.11	Upper middle income
34	St. Vincent and the Grenadines	4.04	Upper middle income
35	Kuwait	4.01	High income: nonOECD
36	Ghana	4.00	Lower middle income
37	Costa Rica	3.95	Upper middle income

Rank	Country	Average GDP Growth Rate	Income Group
38	Morocco	3.81	Lower middle income
39	Malta	3.71	High income: nonOECD
40	Gambia, The	3.70	Low income
41	Dominica	3.49	Upper middle income
42	Colombia	3.49	Upper middle income
43	Malawi	3.46	Low income
44	Kenya	3.43	Low income
45	Grenada	3.42	Upper middle income
46	Namibia	3.36	Upper middle income
47	Lesotho	3.32	Lower middle income
48	Paraguay	3.30	Lower middle income
49	Philippines	3.22	Lower middle income
50	Honduras	3.21	Lower middle income
51	Peru	3.10	Upper middle income
52	Seychelles	3.08	Upper middle income
53	Senegal	3.06	Lower middle income
54	Albania	2.99	Upper middle income
55	Papua New Guinea	2.98	Lower middle income
56	Mauritania	2.93	Lower middle income
57	Ecuador	2.91	Upper middle income
58	Guatemala	2.82	Lower middle income
59	Brazil	2.81	Upper middle income
60	Algeria	2.67	Upper middle income
61	United States	2.67	High income: OECD
62	Iceland	2.66	High income: OECD
63	Norway	2.65	High income: OECD
64	Mexico	2.63	Upper middle income
65	Spain	2.60	High income: OECD
66	Canada	2.55	High income: OECD
67	Zambia	2.51	Lower middle income
68	Bolivia	2.47	Lower middle income
69	Finland	2.45	High income: OECD
70	South Africa	2.44	Upper middle income
71	Uruguay	2.42	High income: nonOECD
72	Portugal	2.38	High income: OECD
73	New Zealand	2.32	High income: OECD
74	United Kingdom	2.32	High income: OECD
75	Netherlands	2.30	High income: OECD

Rank	Country	Average GDP Growth Rate	Income Group
76	Sierra Leone	2.24	Low income
77	Sweden	2.12	High income: OECD
78	Austria	2.11	High income: OECD
79	Comoros	2.07	Low income
80	Gabon	2.05	Upper middle income
81	Saudi Arabia	2.01	High income: nonOECD
82	Japan	1.99	High income: OECD
83	Venezuela, RB	1.98	Upper middle income
84	Belgium	1.97	High income: OECD
85	Tonga	1.96	Upper middle income
86	Nicaragua	1.95	Lower middle income
87	Bulgaria	1.87	Upper middle income
88	France	1.83	High income: OECD
89	Germany	1.74	High income: OECD
90	Greece	1.72	High income: OECD
91	Madagascar	1.71	Low income
92	Denmark	1.69	High income: OECD
93	Latvia	1.67	High income: nonOECD
94	Switzerland	1.66	High income: OECD
95	El Salvador	1.63	Lower middle income
96	Italy	1.54	High income: OECD
97	Guyana	1.39	Lower middle income
98	Hungary	1.15	Upper middle income
99	Central African Republic	1.11	Low income
100	Barbados	1.08	High income: nonOECD
101	Zimbabwe	1.05	Low income
102	Cote d'Ivoire	1.02	Lower middle income
103	Congo, Dem. Rep.	0.14	Low income
104	Georgia	-0.22	Lower middle income

Source: World Bank World Development Indicators

With regard to the percentage of female population, on average, the countries in the sample have 50.22 percent of women in the total population. While the highest percentage comes from Latvia in 2001 (54.1percent), the lowest number is from 2006's Kuwait: 39.98percent. It is also noted that the proportion of women has been low for many years in Kuwait, and at the same time its national savings rate has been kept at a relatively high level (see Table 4.2).

As to the variable of social security net, which is measured as the share of public health expenditure in total health expenditure, its average is 16.34, indicating that countries in the sample averagely spend 16.34percent of GDP in public health. Among these countries, Kuwait spent the highest share of GDP (76.22percent, 1991) in public health. In contrast, Zimbabwe's share of public health expenditure in GDP is only 2.05percent.

The variable of political system ranges from +10 (strongly democratic) to -10 (strongly autocratic). In the sample of this study, the most democratic countries (+10) from 1980-2010 include (see Table 4.4): Austria, Canada, Costa Rica, Cyprus, Denmark, Finland, Germany, Greece, Hungary, Ireland, Israel, Italy, Japan, Mauritius, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, United States, and Uruguay. The strongly autocratic countries in the sample include: Saudi Arabia (-10), Swaziland (-9), Syrian Arab Republic (-7), China (-7), Kuwait (-7), and Morocco (-6).

The variable of political stability ranges from approximately -2.5 (least stable) to 2.5 (most stable). The highest score belongs to Finland in 2003 (1.67), whereas the

lowest score is from Democratic Republic of the Congo in 1998 (-2.99). The average

political stability scores by countries are also listed in Table 4.5.

Table 4.4 Political System Scores by Countries (1980-2010 Average)

Quartiles	25% least democratic	26% -50% democratic	51%-75% democratic	25% most democratic
Countries	Saudi Arabia	Zambia	Mexico	Austria
	Swaziland	Venezuela, RB	Paraguay	Canada
	Syrian Arab Republic	Sierra Leone	Korea, Rep.	Costa Rica
	China	Kenya	Botswana	Cyprus
	Kuwait	Mozambique	Brazil	Denmark
	Morocco	Indonesia	Dominican Republic	Finland
	Gambia, The	Sri Lanka	Guatemala	Germany
	Sudan	Malawi	Latvia	Greece
	Egypt, Arab Rep.	Thailand	Philippines	Hungary
	Mauritania	Georgia	Bolivia	Ireland
	Rwanda	Comoros	Nicaragua	Israel
	Tunisia	Guyana	Bulgaria	Italy
	Congo, Rep.	Madagascar	France	Japan
	Zimbabwe	Namibia	India	Mauritius
	Gabon	Ghana	Panama	Netherlands
	Jordan	Senegal	South Africa	New Zealand
	Singapore	Ecuador	Chile	Norway
	Algeria	Honduras	Belgium	Portugal
	Pakistan	Colombia		Spain
	Central African Republic	Lesotho		Sweden
	Nepal	Albania		Switzerland
	Congo, Dem. Rep.	Turkey		United Kingdom
	Malaysia	El Salvador		United States
	Bangladesh	Peru		Uruguay
	Papua New Guinea			

Table 4.5 Political Stability Scores by Countries (1980-2010 Average)

Quartiles	25% least stable	26% -50% stable	51% -75% stable	25% most stable
Countries	Congo, Dem. Rep.	Paraguay	Ghana	Namibia
	Sudan	Ecuador	Malawi	Italy
	Pakistan	Papua New Guinea	El Salvador	Costa Rica
	Colombia	Bolivia	Lesotho	Uruguay
	Central African Republic	Egypt, Arab Rep.	Panama	Mauritius
	Nepal	Guyana	Spain	Hungary
	Indonesia	Mexico	Zambia	Belgium
	Algeria	Thailand	Tunisia	Botswana
	Israel	China	Mozambique	Germany
	Sri Lanka	Honduras	Malaysia	Canada
	Philippines	Morocco	Gabon	Japan
	Bangladesh	Senegal	Bulgaria	Portugal
	India	Albania	Gambia, The	Singapore
	Kenya	Nicaragua	Kuwait	Netherlands
	Venezuela, RB	Comoros	Korea, Rep.	Austria
	Zimbabwe	Syrian Arab Republic	United States	Denmark
	Rwanda	Jordan	Cyprus	New Zealand
	Georgia	Saudi Arabia	Greece	Ireland
	Congo, Rep.	Mauritania	United Kingdom	Sweden
	Peru	South Africa	Latvia	Norway
	Turkey	Dominican Republic	France	Switzerland
	Sierra Leone	Madagascar	Chile	Finland
	Guatemala	Swaziland		
		Brazil		

Regulatory efficiency is graded on a scale of 0 to 100, where a 0 stands for inefficient, burdensome regulation while a 100 signifies efficient, effective regulation. In the sample of this study, the average score on regulatory efficiency is 69.27. While Singapore ranked the 1st with a high score of 96.53 in 2005, Zimbabwe scored only 26.07 in 2010. The average regulatory efficiency scores by countries are listed in Table 4.6. The lowest scores come from The Democratic Republic of Congo, Zimbabwe, Sudan, Venezuela, and Comoros. The highest scores are from Singapore, Denmark, New Zealand, United States, and Canada.

The level of corruption control is measured as the perceptions of the extent to which public power is exercised for private gain and ranges from -2.5 (least effective) to 2.5 (most effective). Its mean is .15 and its standard deviation is 1.07. With a score of 2.59, Finland is the most transparent country in the sample. Unfortunately, the lowest score (-2.06) goes to Democratic Republic of the Congo again. The average corruption control scores by countries are listed in Table 4.7.

With a high standard deviation of 547.07, the variable of population density shows a large variation among the countries in the sample. While there are 7,250 people per square kilometer in Singapore in 2010, Namibia's population density is only 1.23 in 1980.

A correlation matrix of the variables is shown in Table 4.8. It is noted that the correlations among these variables are moderate or low.

Table 4.6 Regulatory Efficiency Scores by Countries (1980-2010 Average)

Quartiles	25% least efficient	26% -50% efficient	51% -75% efficient	25% most efficient
Countries	Congo, Dem. Rep.	Senegal	Papua New Guinea	Namibia
	Zimbabwe	Bolivia	Mexico	Malaysia
	Sudan	Bulgaria	Morocco	Italy
	Venezuela, RB	Guatemala	Uruguay	France
	Comoros	Philippines	Algeria	Tunisia
	Turkey	Egypt, Arab Rep.	Swaziland	Chile
	Ecuador	Lesotho	Colombia	Netherlands
	Mozambique	Nicaragua	Hungary	Kuwait
	Sierra Leone	China	Greece	Finland
	Zambia	Kenya	Latvia	Saudi Arabia
	Malawi	Syrian Arab Republic	Sri Lanka	Austria
	Paraguay	Albania	Portugal	Belgium
	Ghana	Madagascar	Spain	Sweden
	Honduras	Georgia	Panama	Cyprus
	Bangladesh	Guyana	Mauritius	Switzerland
	Indonesia	Gambia, The	Botswana	United Kingdom
	Central African Republic	Pakistan	South Africa	Ireland
	Congo, Rep.	Peru	Norway	Japan
	Mauritania	Gabon	Germany	Canada
	Rwanda	Costa Rica	Jordan	United States
	India		Korea, Rep.	New Zealand
	Dominican Republic		Thailand	Denmark
	Brazil		Israel	Singapore
	Nepal		El Salvador	

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Table 4.7 Control of Corruption Scores by Countries (1980-2010 Average)

Quartiles	25% least effective	26% -50% effective	51% -75% effective	25% most effective
Countries	Congo, Dem. Rep.	Philippines	Saudi Arabia	Uruguay
	Sudan	Gambia, The	Bulgaria	Israel
	Paraguay	Georgia	Turkey	Portugal
	Zimbabwe	Nepal	Morocco	Cyprus
	Central African Republic	Malawi	Ghana	Spain
	Bangladesh	Guyana	Lesotho	Japan
	Papua New Guinea	China	Madagascar	France
	Congo, Rep.	Mozambique	Brazil	Belgium
	Venezuela, RB	Egypt, Arab Rep.	Tunisia	Chile
	Kenya	El Salvador	Latvia	United States
	Pakistan	India	Jordan	Ireland
	Sierra Leone	Rwanda	Malaysia	Germany
	Ecuador	Mauritania	Namibia	United Kingdom
	Comoros	Panama	Italy	Austria
	Honduras	Mexico	Greece	Canada
	Syrian Arab Republic	Swaziland	South Africa	Norway
	Indonesia	Peru	Korea, Rep.	Switzerland
	Gabon	Senegal	Mauritius	Netherlands
	Albania	Colombia	Hungary	Singapore
	Zambia	Sri Lanka	Costa Rica	Sweden
	Nicaragua	Thailand	Kuwait	New Zealand
	Guatemala		Botswana	Finland
	Algeria			Denmark
	Bolivia			
	Dominican Republic			

Table 4.8 A Correlation Matrix of the Variables (Model 3, 4, and 5)

	SRT	RGDP	GDPGR	CREDIT	ADRAT	URB	FEPOP	SSN	POLISYS	POLISTA	REGUEFF	CTRLCORR	POPDNST	REGION
SRT	1													
RGDP	0.309	1												
GDPGR	0.0831	-0.2216	1											
CREDIT	0.1755	0.7028	-0.2481	1										
ADRAT	-0.4438	-0.5358	0.0539	-0.5568	1									
URB	0.4363	0.5883	-0.1363	0.3653	-0.5735	1								
FEPOP	-0.303	0.0635	-0.1639	0.0857	0.001	-0.0584	1							
SSN	-0.1425	0.3843	-0.2043	0.2661	-0.217	0.236	0.0734	1						
POLISYS	-0.1266	0.3574	-0.1436	0.3379	-0.3162	0.2303	0.4368	0.1259	1					
POLISTA	0.2085	0.6264	-0.1217	0.441	-0.3876	0.4414	0.1801	0.399	0.3549	1				
REGUEFF	0.2952	0.651	-0.1204	0.5507	-0.5088	0.4722	0.0238	0.3767	0.2035	0.5656	1			
CTRLCORI	0.2589	0.8455	-0.1643	0.6167	-0.5719	0.5762	0.1509	0.4758	0.4259	0.7624	0.7275	1		
POPDNST	0.2207	0.2115	0.0756	0.045	-0.2001	0.1765	-0.0447	-0.1195	-0.1102	0.1273	0.2587	0.2165	1	
REGION	0.0351	-0.309	0.1092	-0.1511	0.3186	-0.2668	-0.0895	-0.3203	-0.1672	-0.2143	-0.1461	-0.3039	0.1756	1

Results of the Panel Data Models

Table 4.9 presents the results of the estimation. Since a large number of variables from a variety of sources are combined in this study, there are many more observations for some of the explanatory variables than for others. There are more than 3000 observations for the dependent variable and for 9 of the explanatory variables, including real GDP per capita, GDP growth rate, domestic credit, urbanization level, age dependency ratio, female ratio, social security net, population density, and region. However, there are only 1000 observations for the remaining four explanatory variables: political system, political stability, regulatory efficiency, and control of corruption. All of these are political and governmental factors. Consequently, I estimate mainly two specifications, one with the more restricted set of 9 explanatory variables for the full sample, and one with the complete set of 13 variables for the more limited sample.

Column (1) and (2) show the results of the fixed effects model and the random effects model without political and governmental factors (full sample). Column (3) and (4) demonstrate the results of the same fixed effects model and the random effects model including political and governmental variables (limited sample). Taking political and governmental factors into account, the R^2 of Model (3) and Model (4) is higher than that of Model (1) and Model (2), respectively. In the random effects model that includes political system, political stability, regulatory efficiency, and corruption control, the R^2 is .3970, indicating that the independent and control variables in the model account for about 40percent of the variance in national savings

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rate. Moreover, in either case, the R^2 of the random effects models is higher than that

of the fixed effects models.

Table 4.9 Estimation Results

Variables	(1) Fixed effects	(2) Random effects	(3) Fixed effects	(4) Random effects	(5) Hausman-Taylor estimator
Real GDP per capita	.0002**	.0003***	**.0005****	**.0004****	**.0004****
	(.0001)	(.0001)	**(.0002)**	**(.0001)**	**(.0001)**
GDP growth rate	.2209***	.2205***	**.1617****	**.1655****	**.1628****
	(.0264)	(.0264)	**(.0447)**	**(.0443)**	**(.0441)**
Domestic Credit	-.0214***	-.0224***	**-.0260****	**-.0255****	**-.0279****
	(.0046)	(.0046)	**(.0088)**	**(.0083)**	**(.0087)**
Urbanization Level	.1130**	.1322***	.0265	.1249*	.1672**
	(.0332)	(.0293)	(.1027)	(.0544)	(.0636)
Age Dependency	-.0323	-.0337	-.0414	-.0686	-.0003
Ratio	(.0200)	(.0189)	(.0504)	(.0400)	(.0445)
The Percentage of	-1.8469***	-1.7994***	**-2.6357****	**-2.6587****	**-3.3507****
Women	(.3584)	(.3175)	**(.8775)**	**(.5552)**	**(.7754)**
Public Health	.2799***	-.2811***	**-.7329****	**-.7426****	**-.7427****
Expenditure	(.0332)	(.0328)	**(.0714)**	**(.0679)**	**(.0704)**
Political System			. 0839	-.0077	.0400
			(.0800)	(.0757)	(.0764)
Political Stability			**1.7617****	**1.8887****	**1.6954****
			(.5246)	**(.5019)**	**(.5045)**
Regulatory			**.0701***	**.0824****	**.0785****
Efficiency			**(.0275)**	**(.0272)**	**(.0271)**
Control of			.7602	.6644	.7792
Corruption			(.7857)	(.7168)	(.7247)
Population Density	.0024*	.0019*	-.0007	-.0001	.0008
	(.0010)	(.0009)	(.0026)	(.0014)	(.0025)
Region	--	.2042	--	.6350	.8229
	--	(.5370)	--	(.5923)	(.7503)
R-sq	.3057	.3258	.3239	.3970	
Number of Observations	2884	2884	1010	1010	**1010**
Number of Countries	100	100	91	91	**91**

*5% significance level, ** 1% significance level, *** 0.1% significance level

To decide between the fixed or random effects models, I ran a Hausman test where the null hypothesis is that the preferred model is the random effects model. It tests whether the individual country-specific random effects are correlated with the regressors. The null hypothesis is they are not. With 13 independent variables and 1010 observations (see Table 4.4), the value of the Hausman test's chi-squared statistic is 30.72, rejecting the null hypothesis even at the 1percent significance level. Therefore, the Hausman test suggests choosing the fixed effects model.

However, the fixed effects models are unable to estimate the coefficients of explanatory variables that vary across countries but are invariant over time. For example, the variable of region is omitted in both of Model (1) and Model (3). In examining the determinants of savings rate, I am anxious to explore the effects of time-invariant variables as well as those that vary over time in each country. And therefor I resort to the Hausman-Taylor model where "*some* of the regressors are correlated with the individual effects" (Baltagi, Bresson, and Pirotte 2003, 361). Different from either fixed effects model or random effects model, the Hausman-Taylor model assumes some of the regressors independent of the random individual effects, but others are correlated with this country-specific component of the disturbance and thus endogenous.

One difficulty with Hausman-Taylor estimator is how to identify which of the regressors should be viewed as correlated with the unobserved country-specific effects, and which should be considered exogenous. Following Elbahnasawy and Revier (2012), I checked the statistical significance of the difference between the fixed-effects and random-effects coefficients for every explanatory variables, which

is available in the results of the Hausman test. If the difference is significant, then that variable will be regarded as endogenous in the Hausman-Taylor procedure. "The logic here is that the fixed-effects estimators are consistent no matter what, so when the random-effects estimators are significantly different, that must be because those variables were correlated with the disturbance term and therefore endogenous" (Elbahnasawy and Revier 2012, 321). In this study, time-varying explanatory variables treated as endogenous are: real GDP per capita, growth rate, borrowing constraints, female ratio, age dependency ratio, social safety net, regulatory efficiency, population density. Time-varying explanatory variables treated as exogenous are: urbanization level, political system, political stability, and control of corruption.

Economic Factors

The variable of income, indicated as real GDP per capita, is statistically significant in all five models. In the Hausman-Taylor model, its coefficient is .0004. Holding everything else constant, a one-standard-deviation increase in real GDP per capita increases national savings rate by .0004. Although the coefficient is not very large (ranging from .0002 to .0005), it confirms that there is a positive relationship between a country's income and savings rate.

Another economic factor, GDP growth rate, is statistically significant at 0.1percent significance level in all three models. Its coefficient is .2209 in Model (1), suggesting a strong relationship between growth rate and savings rate: a one-standard-deviation increase in GDP growth rate enhances national savings rate by

.2209. This result is consistent with life-cycle hypothesis: Savings rate depends on the long-term rate of income growth (Modigliani and Cao 2004).

Measured as the percent share of domestic credit of GDP, domestic credit is statistically significant and negative in all five models. Its coefficient in Hausman-Taylor model is -.0279. One thing needing our attention is that domestic credit is used to measure the borrowing constraint. The higher a country's domestic credit, the less stringent the borrowing constraints are likely to be. Accordingly, there is a positive relationship between a country's borrowing constraints and its savings rates. The more stringent a country's borrowing constraints, the higher the national savings rate is likely to be.

Demographic Factors

The level of urbanization is significant and positive in all the models except Model 3. That is, the higher a country's level of urbanization, the higher the national savings rate is likely to be. This finding is not consistent with what was expected. However, it partly accords with Lewis (1954)' predictions of developing economies where a labor transition happens between agricultural sectors and modern sectors. With ample labor resources moving to urban areas, developing economies are able to gain more profits and have a higher savings rate.

Surprisingly, the age dependency ratio is not significant in all the models, which contradicts with the life cycle hypothesis. However, this result is, to certain extent, in accordance with Chamon and Prasad's argument that demographic shifts cannot explain the increase in savings in China and demographic factors play at best a minor role in explaining this increase (2008). They found a U-shaped profile of

savings in China instead of the traditional "hump-shaped" pattern in the life cycle model.

The percentage of female population in the total population, one of the demographic factors, has a negative and significant relationship with savings rate. The coefficient is -3.3507, suggesting a strong effect of female ratio on savings rate: each one-standard-deviation decrease in the proportion of women in the population enhances savings rate by 3.3507. This accords very well with Wei and Zhang's theory of competitive motive for saving: a rising gender imbalance makes parents (especially Chinese parents) with sons save a larger share of income to increase the odds of winning a bride.

Political and Governmental Factors

Social safety net has a large impact on savings rate. Operationalized as the percentage of public health expenditure in total health expenditure, social safety net is statistically significant in all five models. Its coefficient in the Hausman-Taylor Model is -.7427. That is, there is a negative relationship between the size of a country's social safety net and its savings rate. The more comprehensive a country's social safety net, the lower the national savings rate is likely to be.

However, political system is insignificant in all the three models. Political regime doesn't exert an influence on savings rate. It appears that Przeworski's argument is right: "there is no trade-off between democracy and development" (2000, 178).

Indicated as perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, political stability is

statistically significant and positive in all the three models taking political factors into account. According to the Hausman-Taylor estimation, a one standard deviation rise in political stability increases national savings rate by 1.1765. It confirms that political stability is a critical factor in terms of determining economic development and savings rate (Przeworski et al. 2000; Aisen and Veiga 2013; Venieris and Gupta 1986; Alesina and Perotti 1996; Londregan and Poole 1990; Fielding 2003).

The quality of government regulation is measured by the regulatory efficiency in the Index of Economic Freedom from the Heritage Foundation. Regulatory efficiency is statistically significant and positive among all the three models, indicating a positive relationship between regulatory efficiency and savings rate. The higher the regulatory efficiency in a country, the higher the national savings rate is likely to be.

Unexpectedly, control of corruption is insignificant in all the three models. It seems like there isn't a significant relationship between control of corruption and savings rate in these specifications.

Control Variables

The results of population density are mixed. Its coefficients are significant in the specifications without political and governmental factors, but they turned insignificant in the specifications with political and governmental factors. The newly added political and governmental variables most likely picked up some of the variations in the dependent variable, reducing the impact of this variable compared to models 1 and 2.

The other control variable, region, is not statistically significant. There must be some other variables that are playing a role. Moreover, if we regard region as a proxy of culture, which is often see in studies, then culture is not a determining factor of savings rate. This might explain why the validity of the cultural argument has been doubted by a lot of scholars (Garon 2011; Guo and N'Diaye 2010; Hung and Qian 2010; Modigliani and Cao 2004).

To summarize, according to the estimation results, political and governmental factors do exert an influence on national savings rate. First, the R^2 of the models including political factors is much higher than that of the specifications without political factors. Second, both the political stability and regulatory efficiency are statistically significant and positive in all the specifications that include them. This accords very well with what is hypothesized. Moreover, other determinants of national savings rate include real GDP per capita, GDP growth rate, domestic credit, urbanization level, female ratio, and social safety net.

CHAPTER 5 FACTORS OF CHINA'S HIGH SAVINGS RATE

Introduction

According to the results of the panel data study in Chapter 4, primary

determinants of savings rates include GDP per capita, GDP growth rate, borrowing

constraints, gender imbalance, social safety net, political stability, and regulatory

quality. Will these findings hold true in China, the country that has one of the highest

national savings rate across the world? As seen in Figure 1.1 in Chapter 1, East Asian

countries have the highest national savings rates in the world.[8] From 1980-2010, East

Asian countries' national savings rates were much higher than the world average most

of the time. While these economies are at different stages of economic

development—and have distinct histories, political systems, and societal

characteristics—all their savings rates are relatively high. Common factors behind the

high savings rates include: relatively high growth rates, the important role of

government in economic development, and an export-oriented development approach

(Park and Patrick 2013; Jha et al. 2009; Carroll 2010). However, from 2000 onwards,

China's national savings rate increased along a steep trajectory, leaving its East Asian

neighbors far behind.

Take Japan and China, two of the economic powerhouses of East Asia, for

example (see Figure 5.1). Between 1980 and1992, the difference between China and

Japan's national savings rate was small (around five percentage points). In 1989,

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[8] East Asian countries in Figure 1.1 include China, Japan, and The Republic of Korea (South Korea).

China's national savings rate was 35.99 percent of GNI, and Japan's national savings

rate was 33.87 percent of GNI. Starting from 1993, the difference became

increasingly large.

Figure 5.1 Gross National Savings Rate (percent), China and Japan, 1980-2010

Source: World Bank World Development Indicators
(http://data.worldbank.org/indicator)
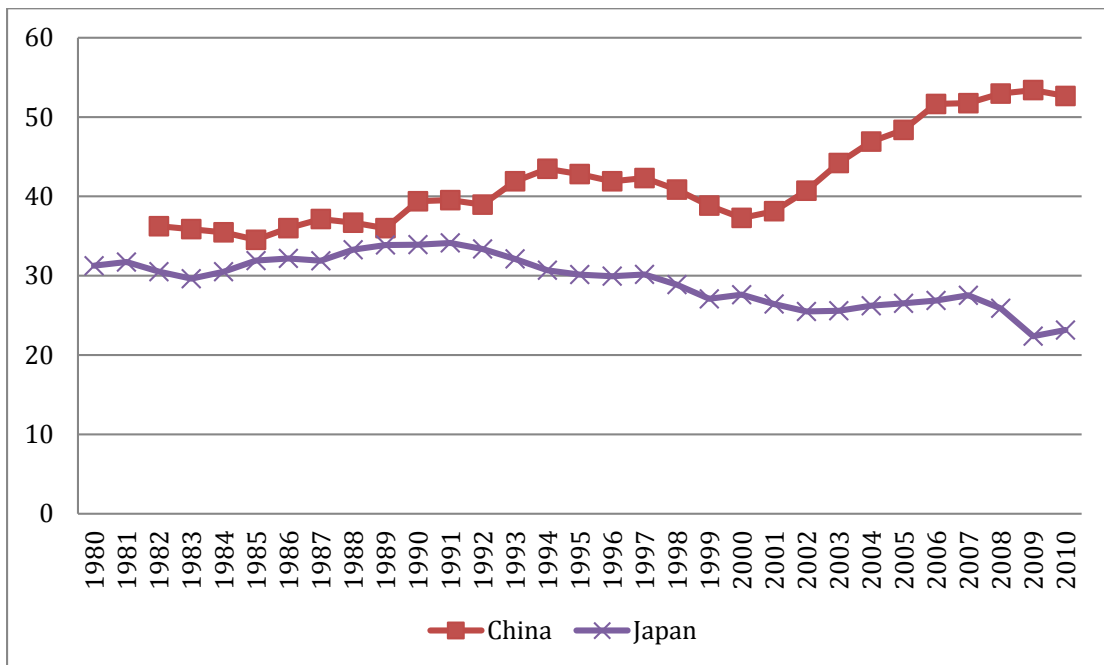
Since 2002, China's savings rate started growing at an unprecedented pace of 23

percent. [9] In 2009, Japan's savings constituted only 22 percent of its national income,

but China's national savings took up 53 percent, more than twice of the savings rate

of Japan. It is well known that the decline in Japan's savings rate since 1993 is mainly

because of its economic recession beginning in the early 1990s. From 1990 to 2009,

Japan's GDP average growth rate was only 0.77 percent. The period of the long

stagnation of the Japanese economy is called "the lost decade[s]." But what are the

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[9] From 2002 to 2010, based on data on gross savings (in current US dollars) from World Bank's World
Development Indicators

factors that have made Japan's and China's savings rates diverge in 2000? Why did China's national savings rate skyrocket since 2000?

In this chapter, I apply the results of the panel data study to China's case and explore the factors of China's high savings rate, especially after the year of 2000. In addition, to understand the sources of the high Chinese savings, China's gross national savings will be analyzed through its components: household, corporate, and government savings. This breakdown can also highlight the changing part of the three sectors during the process of China's economic development.

A Comparison of China and Japan's Savings Rate

In this section, I explore the factors identified through the panel data regression analysis to understand China's sustained and increasing savings rate as other countries' savings rates have leveled off or declined during the same period.

High Income Growth Rate and Low Per Capita Income

According to the estimation results in chapter 4, the (log) level and the growth rate of real per capita GDP have a positive and significant effect on national savings rates. According to the World Bank, from 1980 to 2010, China's average GDP growth rate was 10 percent, whereas the GDP of Japan grew at about 2 percent per year during the same period. Based on the positive link between growth rate and savings rate, China's savings rate should be relatively high. This accords very well with the fact.

In December 1978, China started the most important economic reform in its history: *Gaige Kaifang* (Reform and Opening Up). Under the leadership of Deng Xiaoping, state control of the economy was significantly reduced. Market forces were

allowed to play an increasingly important role. Private enterprise was encouraged. The government also allowed unprecedented levels of foreign investment. Moving from a command toward a market economy China's economic growth has been phenomenal. Since 1978, China's economy has grown at an impressive annual growth rate (see Figure 5.2). For one five-year period between 1992 and 1996, moreover, China's growth rate averaged an astounding 12.44 percent per annum. According to the World Bank, China overtook Japan to become the second largest economy after the United States in 2010. In addition, the International Monetary Fund for the first time ranked China's economy as the world's biggest this year in purchasing-power-parity terms. [10]

Figure 5.2 GDP Growth Rate, percent, 1980-2010

Source: World Bank World Development Indicators
(http://data.worldbank.org/indicator)

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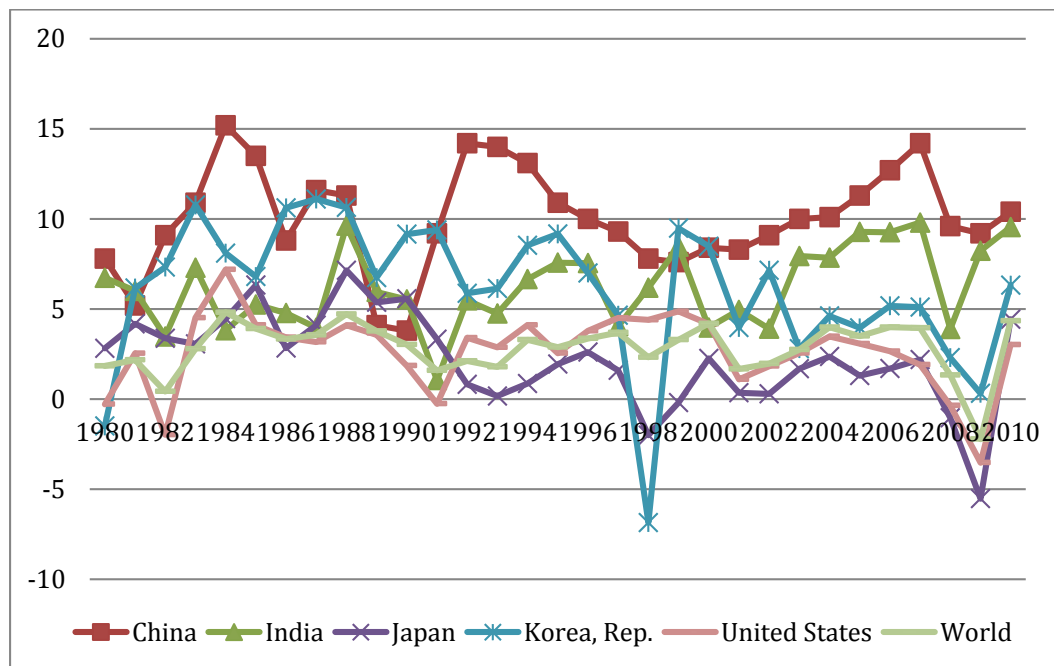
[10] China's back. The Economist. http://www.economist.com/news/finance-and-economics/21623758-chinas-back

Despite rapid economic growth in recent years, China still has a relatively low

per capita income (see Figure 5.3). During the period of 1980-2010, Japan's average

Figure 5.3 Real GDP Per Capita, constant 2000 US$, 1980-2010

Source: World Bank World Development Indicators
(http://data.worldbank.org/indicator)
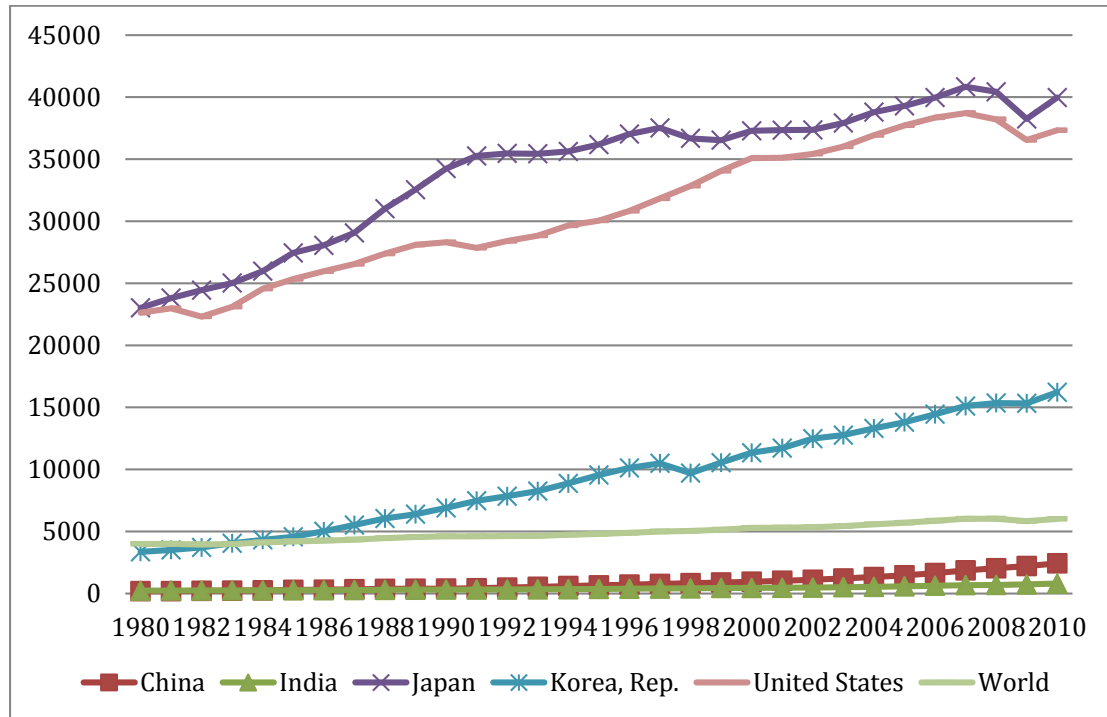
GDP per capita is $34122.29, whereas China's is only $848.42.[11] In 2013, while

China's GDP per capita was $3583.38, Japan's GDP per capita was $37432.91, more

than ten times of China's.[12] According to the World Bank, China remains a

developing country. [13] The effect of income is greater in developing than in

developed countries, tapering off at medium or high income levels. In developing

countries, a doubling of income per capita is estimated to raise the long-run private

savings rate by ten percentage points of disposable income (Loayza, Schmidt-Hebbel,

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[11] Both in constant 2000 US dollars.
[12] Both in constant 2005 US dollars.
[13] China Overview. http://www.worldbank.org/en/country/china/overview

and Servén 2000a). This may explain why China has a much higher savings rate than Japan during 1980-2010 despite Japan's higher per capita income.

It is also argued that China's economic rise is because China's economy is firmly situated within the international economic system and other countries need China's participation (Lim 2010). The large market, the very low labor costs, and the cheap land made China an extremely attractive location for investment and production. At the same time, China's economic growth also needs capital. Across countries higher savings rates tend to go hand in hand with higher income growth (Loayza, Schmidt-Hebbel, and Servén 2000a). This pattern of rapid income growth resulting in high savings rates has previously been observed in many high-growth economies such as Japan and South Korea. With the later rise of China's economy, a similar pattern is also working. As income grows rapidly, households often cannot adjust their living standards and consumption patterns at the same pace, and therefore savings tend to increase (Carroll and Weil 1994). Many empirical studies found that there is a strong relationship between China's savings rate and its stunningly high income growth rate (Modigliani and Cao 2004; Horioka and Wan 2007; Hung and Qian 2010).

In short, China is still in an early stage of development with a remarkably high growth rate and a relatively low per capita income. With rapid economic growth, households move away from subsistence levels of income; greater capital accumulation is needed to finance investment and growth, and therefore savings naturally rise (Guo and N'Diaye 2010).

Borrowing Constraints

Based on the results of the panel data study, there is a positive relationship between a country's borrowing constraints and its savings rate. The more stringent a country's borrowing constraints, the higher the national savings rate is likely to be. According to the World Development Indicators, domestic credit provided by the banking sector constitutes 147percent of GDP in China in 2010, and that number is 221percent in the United States and 337percent in Japan (World Bank 2010). And between1980 and 2010, Chinese domestic credit provided by the banking sector is below the world average all the time (see Figure 5.4). With limited access to credit, the Chinese has no other options but to save.

Figure 5.4 Domestic Credit Provided by the Banking Sector (percent of GDP), 1980-2010

Source: World Bank World Development Indicators
(http://data.worldbank.org/indicator)
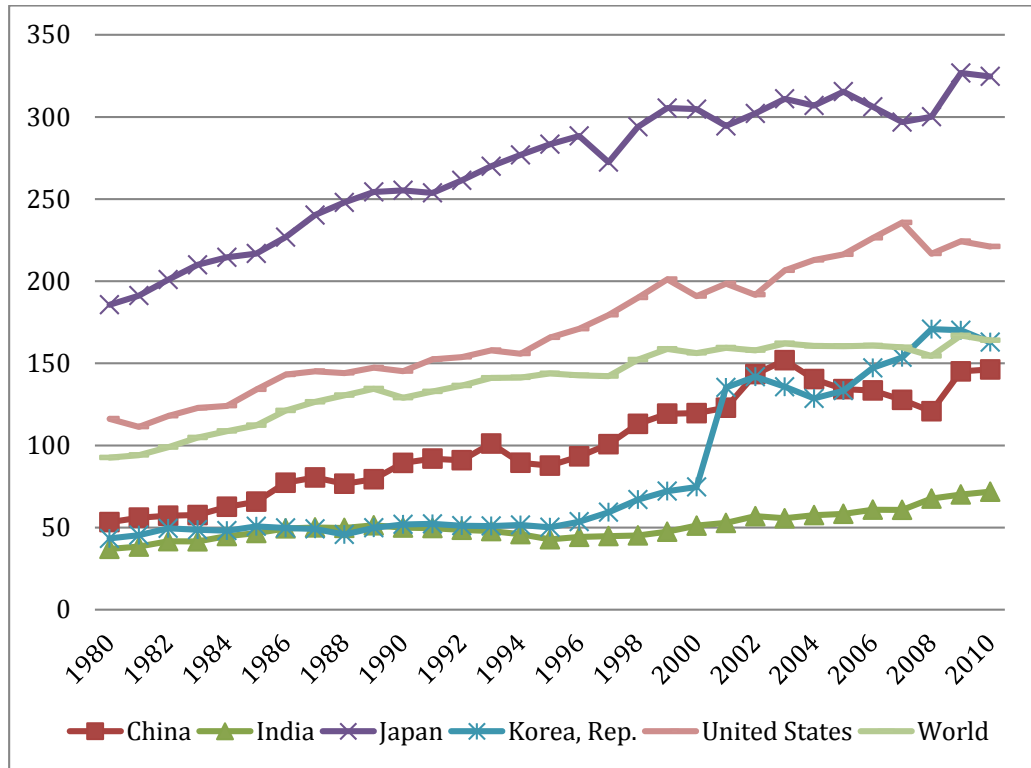
Since 1978, China's reforms have laid the foundation for a modern financial system, but the financial reform is incomplete. Caballero, Farhi, and Gourinchas (2008) argue that financial underdevelopment and saving are closely related. In a fast-growing economy where the desired consumption bundle shifts toward durable goods such as cars and houses, the inability to borrow against future income streams could lead to households saving more to self-finance their purchases. Moreover, lacking diversification opportunities for financial assets could in fact lead households to save more for precautionary purposes.

The low penetration of consumer credit in China is evident in a wide range of consumption expenditures, from consumer durables to housing to higher education spending. Chinese consumers' purchases in these categories typically require the accumulation of a large pool of savings that could be avoidable if consumers had the ability to finance them through borrowing. In 2008-2009, Nielsen's Personal Finance Monitor reported that 73 percent of home owners did not take mortgage loans, 95 percent of car owners bought cars from their own savings, and more than two-thirds of credit card holders claimed to pay their entire outstanding balance every month.[14] According to the 2012 China Payment System Development Report, only 331 million credit cards had been issued in the domestic market by the end of 2012, compared with 3.2 billion debit cards.[15] Garon (2011) writes,

> Chinese save more because of poor access to credit. American
> journalists glory in the story of Chinese conspicuous consumption and

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[14] The Nielsen Company. Saving a Top Priority for Chinese…But Why? Understanding the motivations behind China's   high savings rate.
http://www.nielsen.com/content/dam/corporate/us/en/newswire/uploads/2010/10/nielsen-china-savings-rate-oct-2010.pdf
[15] People's Bank of China.
http://www.pbc.gov.cn/publish/zhifujiesuansi/1071/2013/20131227100311612536873/2013122710031
1612536873_.html

the spread of credit cards. Most of these "credit cards" are, in fact, debit cards tied to bank accounts. Only a small fraction offer revolving credit. The heavily regulated banks have been miserly in extending consumer credit, and they generally require stiff down payments before lending money to homebuyers (313).

Besides individuals, the borrowing constraint for small and medium-sized enterprises (SMEs) is also very tight. SMEs are generally private companies, and they constitute the majority of economic activity in China since the 1978 reform. However, SMEs garner a relatively small share of credit. China's lending to the private sector has been considered "the most discriminatory" among developing countries (Pei 2006, 116). In 1999, China's lending to the private sector was ranked the 63th of the 78 countries surveyed by the World Bank (Pei 2006). The reason the private sector has limited access to credit is that China's investment and export-led development policy greatly favors state-owned enterprises (SOEs). Lacking access to credit forced private firms to turn to internal financing by saving.

Gender Imbalance

The estimation results suggested that there is a negative and significant relationship between savings rate and the percentage of women in the population. That is, the higher the proportion of women in the population, the lower the national savings rate is likely to be. Is this contention applicable to China? As in Figure 5.5, from 1980 to 2010, China consistently had a lower percentage of women than the United States, Japan, and Korea. Moreover, China's percentage of women in the total population was even lower than the world average. According to the 2010 Social Blue Paper released by the Chinese Academy of Social Sciences, there is currently a

serious gender imbalance among the population aged 19 and below in China. For every 100 girls below four years old, there are about 123 boys in the same age range. If this situation remains unchanged, China in 2020 will have 30-40 million more men than women (aged 19 and below), meaning that one in five young men would be unable to find a Chinese bride because of the dearth of young women. [16]

Figure 5.5 Female Population (percent of total population), 1980-2010

Source: World Bank World Development Indicators
(http://data.worldbank.org/indicator)
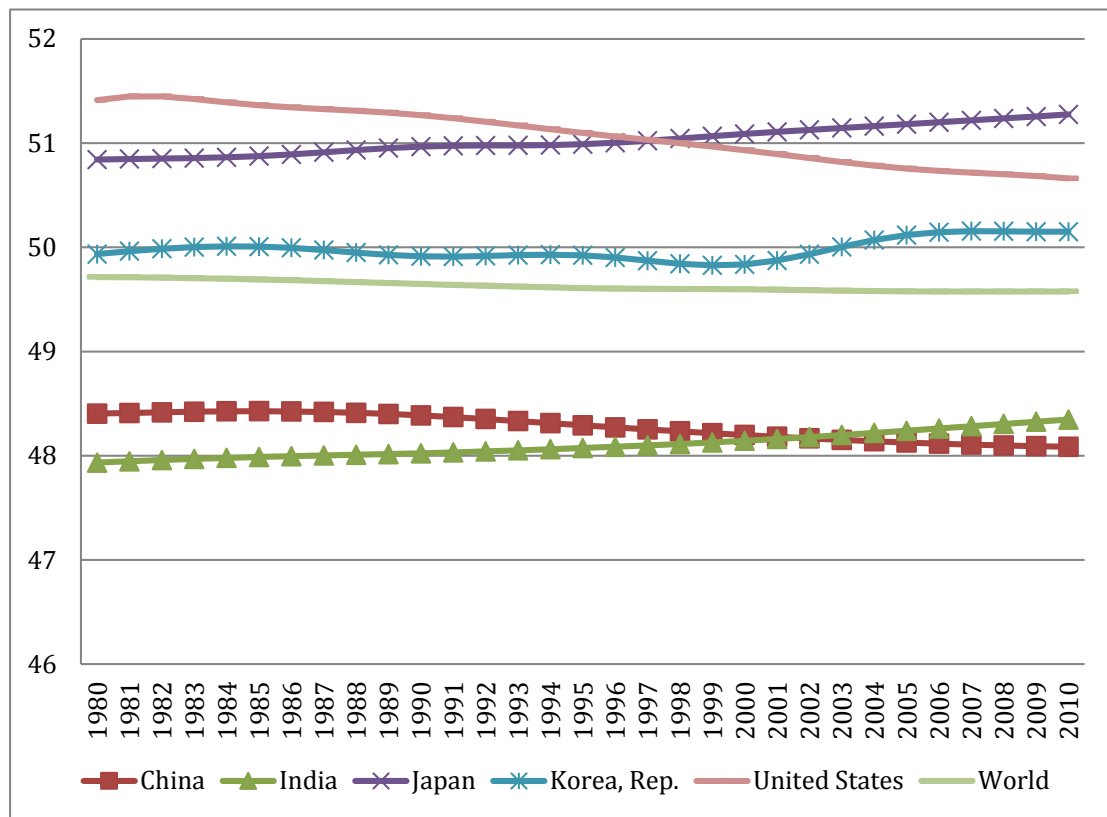
Many scholars contend that the gender discrepancy in China is partly related to its One-Child Policy (Zhu et al. 2009; Yang et al. 2006; Ding and Hesketh 2006; Hesketh, Lu, and Zhu 2005). Beginning in the 1980s, the Chinese government had

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[16] 1 in 5 marriage age Chinese men to remain bachelors within 10 years.
http://en.people.cn/90001/90782/90872/6867770.html

enforced a strict population control policy that has used various means to encourage or even force couples to have only a single child. Traditionally, male children have been preferred in China—particularly in rural areas—as sons inherit the family name and property and are responsible for the care of elderly parents. [17] With the implementation of the one-child policy, most families were restricted to one child. Having only a girl became highly undesirable, resulting in a rise in illegal gender selective abortions. Over time, the overall gender ratio became skewed toward males. As these children came of age, it led to a situation in which there were fewer females available for marriage. Facing the reality of a scarcity of women in the marriage market families with sons compete to increase their savings rate to improve their son's relative attractiveness for marriage (Wei and Zhang 2011).

In a rural income survey from the 2002 Chinese Household Income Project, households were asked to answer what's their main purpose of saving (Shi 2009). There were seven options: (1) Retirement, (2) medical expenses, (3) children's education, (4) building a house (5) children's wedding (6) bequest to children, (7) others (8) hard to say. Among households with husband and wife plus a child, 29.8 percent of households with a son listed savings for their son's wedding as the primary or secondary most important reason for savings versus only 18.3 percent of households with a daughter who gave the same answer. In addition, controlling for local income, social safety net, the age profile of the local population, and province and year fixed effects, Wei and Zhang (2011) found that the local savings rate tends to be higher in provinces and years in which the local gender ratio (the number of men per woman in the premarital cohort) is higher.

[17] One-child policy. http://www.britannica.com/EBchecked/topic/1710568/one-child-policy

Social Services

     The results of panel data study suggest that there is a negative relationship between the coverage of a country's social services system and its savings rate. The percentage of public health expenditure in total health expenditure was used to measure the comprehensiveness of a country's safety net. That is, the more governments spend on health services, the less the need for individuals to save. As seen in Figure 5.6, while Japan's public health expenditure constitutes 80 percent of total health expenditure in 2010, China's only takes up 54 percent. Although China's public health expenditure is not the lowest, but it is still below the average level across the world. According to the World Bank, health expenditure per capita in Japan was $4,752 in 2012, but China's health expenditure per capita was only $322 (both in current U.S. dollars). Limited social services encourage Chinese to self-insure by saving.

Figure 5.6 Public Health Expenditure (percent of health expenditure), 1980-2010

Source: World Bank World Development Indicators
(http://data.worldbank.org/indicator)

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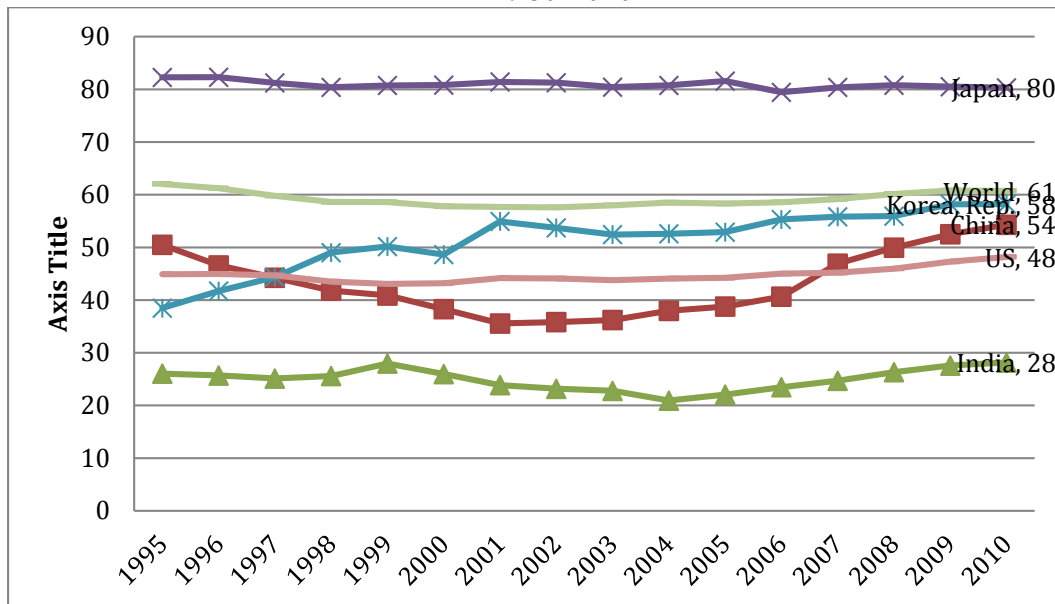
In addition to health expenditure, consider also the pension systems. Japan has a unified two-tier pension system. The first tier is the National Pension system. It is a non-income-related pension that is designed to provide a basic income guarantee for old age, and the participation is mandatory to all residents of Japan. The second tier is the Employees' Pension Insurance system, which provides the earning-related pension on top of the Basic Pension provided by the National Pension system. The Ministry of Health, Labor and Welfare is responsible for pension finance and administration, while the operations are delegated to the Japan Pension Service, a public corporation with non-government employees. [18] In 2005, the level of coverage, the proportion covered by mandatory pension program, was 75 percent in Japan for the population aged 15-64. For the labor force the coverage rate was 95.4 percent, the highest in the world (OECD 2013, 36).

By contrast, China doesn't have a unified national pension system. Urban workers, mainly employees of SOEs and large private enterprises, are covered by the Urban Enterprise Pension System (UEPS). Government employees are covered by the civil service pension system. A recently established Rural Pension program allows rural workers to make voluntary contributions to individual accounts that are subsidized by local and central governments. Overall, in 2010, only 27.7 percent of population aged 15-64 was covered by mandatory pension program. For the labor force, the coverage rate was 33.5 percent (OECD 2013, 36).

Before 1997, state-owned enterprises (SOEs) provided their workers with pensions without regular contributions. In 1997, China established a contributory

pension system by the State Council's Document #26. In late 2009, China has

established a pension program for rural workers. The whole system has three pillars: a

pooling account to redistribute to all beneficiaries; compulsory individual accounts;

and voluntary supplementary pensions provided via commercial insurance.

The contributory system has long been insufficient to support current retirees

(Naughton 2007). Individual contributions designed to fund future retirement are

being "borrowed" to pay those who have already retired. In 2012, the shortfall

widened by another 24 billion yuan to more than 2.6 trillion yuan, according to

the China Pension Report 2013.[19] Funding shortfalls have been caused by the

inability and unwillingness of enterprises to pay into their accounts, combined with

the generous retirement benefits that have been extended to younger retirees shed by

state-owned enterprises during a downsizings of the 1990s (Naughton 2007). As a

result, many individual accounts are actually empty. According to the Center for

International Social Security Studies at the Chinese Academy of Social Sciences,

individual accounts held assets worth only 270 billion yuan at the end of 2011, even

though 2.5 trillion yuan had been paid into them.[20] The remainder had been used by

local authorities for their own priorities.

The reform of the late 1990s also reduced the replacement ratio of pensions

for enterprise workers. The replacement ratio is an important indicator of pension

systems. It shows the value of pension as a percentage of wages. The combined target

replacement ratio of the first and second pillars of the pension system is 58.5 percent,

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[19] China's Pension System Gets More Troubled.
http://www.forbes.com/sites/ywang/2013/12/12/chinas-pension-system-gets-more-troubled
[20] Fulfilling promises. China is beginning to face up to its pension problems.
http://www.economist.com/node/21560274.

down from 75 percent in the pre-reform period (Feng, He, and Sato 2011). As a result, households build up saving to self-insure against uncertainty, especially about pension and health care needs. Using two sets of cross-section data, one for 1995 (before the pension reform) and one for 1999 (after the reform), Feng, He, and Sato (2011) found there is a relationship between the rising household savings rates in urban China and the declining pension benefits. The pension reform increased household savings rates in 1999 by about 6–9 percentage points for cohorts aged 25–29 and by about 2–3 percentage points for cohorts aged 50–59 (Feng, He, and Sato 2011).

Regulatory Quality

In the estimation results of the panel data study, regulatory quality is statistically significant and positive among all the three models, suggesting that there is a positive relationship between regulatory quality and savings rate. All other things being equal, the higher the regulatory efficiency in a country, the higher the national savings rate is likely to be.

Both the Chinese and Japanese governments have played a large and active role in economic development. However, in terms of regulatory efficiency, Japan does a much better job than China. For instance, Japan exceeds China in terms of regulatory efficiency in the Index of Economic Freedom (see Figure 5.7). On a scale between 0 and 100, China's regulatory efficiency score was 58 in 2010, but Japan's score was 88. In the Index of Economic Freedom, regulatory efficiency includes three

Figure 5.7 Regulatory Efficiency, 1996-2010
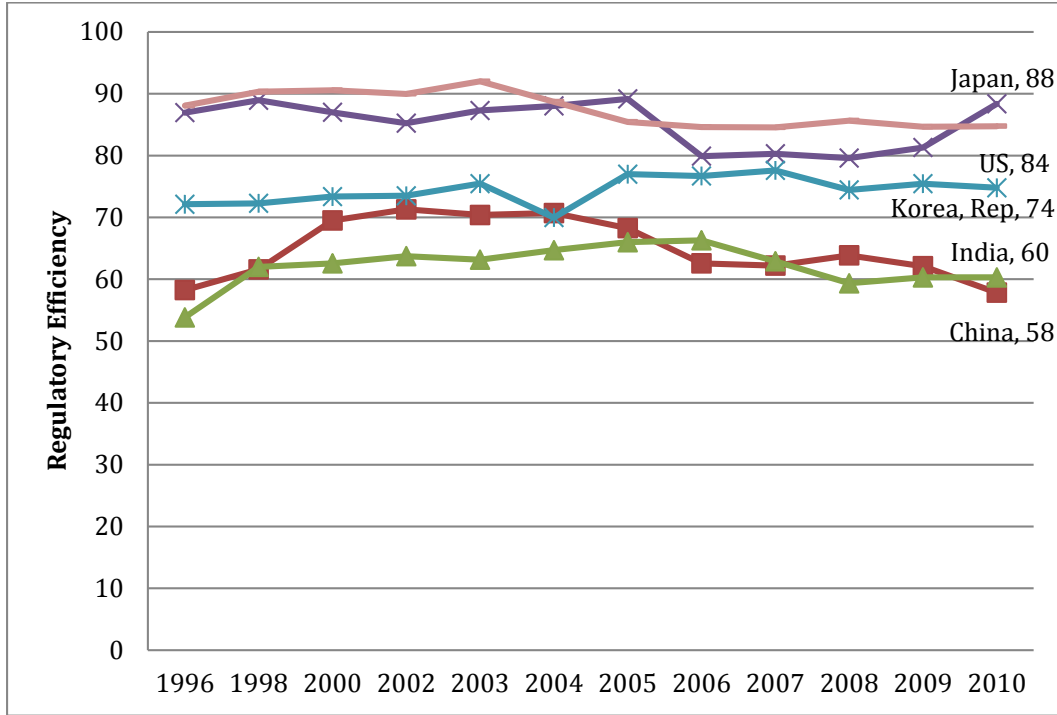
Source: Index of Economic Freedom (http://www.heritage.org/index/explore)

aspects: business freedom, labor freedom, and monetary freedom. As shown in Table

5.1, Japan gets significantly higher scores than China in all the three aspects:

monetary freedom, business freedom, and labor freedom (see Table 5.1).

Table 5.1 Regulatory Efficiency in 2014, Japan and China

Countries	Regulatory Efficiency		
	Business Freedom	Labor Freedom	Monetary Freedom
Japan	80.0	79.8	87.5
China	49.7	61.9	73.3

Source: 2014 Index of Economic Freedom, Heritage Foundation.

With such low regulatory efficiency, why is China's savings rate higher than

other countries? Banking regulation, for example, is closely related to a country's

savings rate and may help explain the high Chinese saving. The banking sector has

been "one of China's most protected industries, overregulated, dominated by state ownership, and protected from international competition (Naughton 2007, 449). According to Pei, "China's financial sector, dominated by the state-controlled banking system, is the weakest among the world's major economies, with a very high level of NPLs (Non-Performing Loans), pervasive corruption, and low efficiency" (2006, 110).

The Chinese banking system consists of a core of state-owned institutions. There are four state-owned commercial banks (the "Big Four"): the Industrial and Commercial Bank of China (ICBC), the Agricultural Bank of China (ABC), the Bank of China (BOC), and the China Construction Bank (CCB). According to Fortune's 2014 Global 500, the Industrial and Commercial Bank of China ranked No. 25 this year and is the world's largest bank by asset size. In addition, the China Construction Bank, the Agricultural Bank of China, and the Bank of China rank 38th, 47th, and 59th, respectively. [21] In addition to the "Big Four" , virtually all the other major joint-stock banks are owned by state-affiliated entities and local governments. The newly formed city commercial banks are owned and controlled by local governments and SOEs. Even rural credit cooperatives, nominally owned by farmers, are run by local governments. The only truly private financial institution is Minsheng Bank. However, with assets of $30 billion in 2003, this bank is a relatively small player.

Although many reform steps have been taken in the banking sector, the dominance of the state-controlled banks remains intact. The government has used regulatory tools to stifle competition and protect the state-owned banks. "The most immediate and important impact of the state's dominance in the banking sector" is the

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[21] Fortune's Global 500 2014. http://fortune.com/global500/

government's tight control of the interest rates (Pei 2006, 114). Deposit rates for all banks were set by the central bank, the People's Bank of China (PBC). The PBC also determines loan rates in the state-owned banks and joint-stock commercial banks that controlled more than 80 percent of the loan market. Under the protection of the Chinese government, SOEs can finance their loans and pay their debts at interest rates significantly lower than the prevailing market rates. Depressed interest rates are "like subsidies to investor s and exporters, and therefore are favorable for boosting investment and exports," leading to rapid economic growth in China (Huang et al. 2013, 120). Since rapid growth is itself a producer of high savings, China has been able to re-invest savings, leading to even higher growth and savings. The depressed interest rate policy was useful for mobilizing resources for economic development at times when the financial system was underdeveloped (Huang et al. 2013). Enterprises, mostly SOEs, were provided a cheap source of funding, which would not have been possible without a state-controlled banking system.

Political Stability

Measured as the perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, political stability is statistically significant and positive in all the three estimation models taking political factors into account. As to the size of the impact of political stability on savings rate, according to the Hausman-Taylor estimation, one-percentage-point rise in political stability increases the national savings rate by 1.1765 percentage points. According to the World Bank's Worldwide Governance Indicators, on a scale of -2.5 (unstable) to 2.5 (stable), Japan's political stability score was 1.01 on average from 1996-2010.

The average score for China was -0.47 (see figure 5.8). Based on a study by the

Chinese Academy of Governance, the number of protests and riots in China doubled

between 2006 and 2010, rising to 180,000 reported " mass incidents." [22] According to

Figure 5.8 Political Stability (-2.5-2.5), China and Japan, 1996-2010
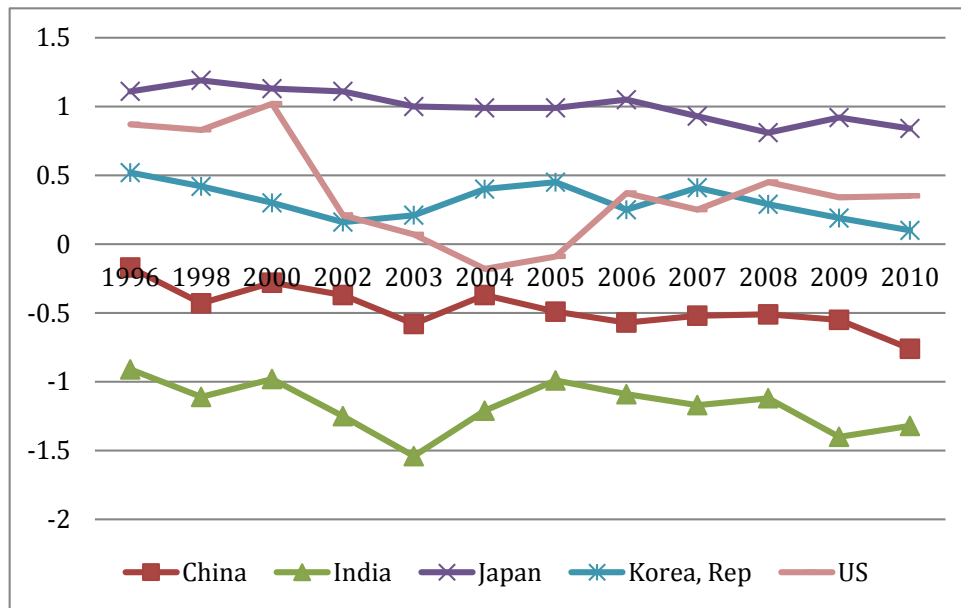
Source: World Bank Worldwide Governance Indicators
(http://data.worldbank.org/data-catalog/worldwide-governance-indicators)

 the Annual Report of Rule of Law in China 2014, public protests in China since 2000

were usually sparked by labor disputes, land acquisitions, forced demolitions,

pollution, traffic accidents and incidents involving ethnic groups. [23] Zheng (2012)

selected a total of 12 sets of indices to measure political instability, and placed China

on a global scale of comparisons. His study has shown that China is ranked better

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[22] "Mass incidents" are officially defined as any kind of planned or impromptu gathering that forms because of "internal contradictions", including mass public speeches, physical conflicts, airing of grievances or other forms of group behavior that may disrupt social stability.
http://www.ft.com/intl/cms/s/0/9ee6fa64-25b5-11df-9bd3-00144feab49a.html#axzz3IX5ENTXw;
Rising Protests in China. http://www.theatlantic.com/infocus/2012/02/rising-protests-in-china/100247/
[23] The Annual Report on China's Rule of Law No.12 (2014) is based on research into 871 mass incidents involving more than 2.2 million people that occurred between Jan 1, 2000, and Sept 30, 2013. The research includes only incidents reported by the mainstream media. Incidents that were reported on micro blogs or online forums were excluded.
http://www.chinadaily.com.cn/china/2014-04-09/content_17415767.htm

than average on four instability/fragility indices; worse than average on six

instability/fragility indices. And China has achieved an average performance

according to only two indices (see Table 5.2).

Table 5.2 Rankings of China's Political Stability in the World

Categories	Political Instability/fragility Indices	China
Better than average	The Political Instability Index by the Economist Intelligence Unit (165 countries)	41st
	The Peace and Conflict Instability Ledger-Instability Index by the University of Maryland (162 countries)	47th
	The Index of State Weakness in the Developing World by the Brookings Institution (141 countries)	68th
	The Corruption Perceptions Index by Transparency International (178 countries)	78th
Worse than Average	The World Bank's Worldwide Governance Indicators-Political Stability and Absence of Violence (213 economies)	25th-50th Percentile
	The State Fragility Index by George Mason University (162 countries)	86th
	The Country Indicator for Foreign Policy-Fragility Index by Carlton University (192 Countries)	103rd
	The Failed States Index by the Foreign Policy and the Fund for Peace (177 countries)	115th
	The Bertelsmann Transformation Index--Status Index by the Bertelsmann Stiftung Foundation (128 countries)	88th
	The Global Peace Index by Transparency International (153 countries)	80th
Average	The Global Political Risk Index by Euroasia Group (24 countries)	12th
	The Bertelsmann Transformation Index--Management Index by the Bertelsmann Stiftung Foundation (128 countries)	64th

Source: Zheng (2012)

Since the Tiananmen Square Event of 1989, the "largest and most protracted

public demonstrations" against the Chinese government in recent years have been

carried out by the "Falun Gong" (or "Falun Dafa", literally means "Dharma Wheel

Practice", FLG) (Lum 2006). According to its official website, FLG is an advanced

self-cultivation practice originated from Buddhism.[24] It was founded in the early

1990s by Li Hongzhi, a one-time government employee now living in the United

States. The movement had 70 million members in China in 1999, rivaling the number

of members of the Chinese Communist Party. [25] Reacting to the movement's growing

popularity, the Chinese government began a crackdown on Falun Gong in 1999.

About ten thousand FLG followers responded that April by holding a peaceful protest

near Zhongnanhai compound where China's top leaders live and work. The Ministry

of Civil Affairs outlawed Falun Gong as an "evil cult" that "had been engaged in

illegal activities, advocating superstition and spreading fallacies, hoodwinking

people, inciting and creating disturbances, and jeopardizing social stability."[26] It is

not only the movement's size that alarms the Chinese party-state but also its ability to

communicate with and mobilize its members and spread its message through both

electronic means and by word of mouth. There have been a few small protests by

FLG followers after the 1999 demonstration, including one in Tiananmen Square in

January 2001 that involved self-immolation. Since 2003, FLG has been largely

suppressed in China while it has thrived in overseas Chinese communities (Lum 2006;

Griffiths 2014).

Compared with developed countries, China is still a developing country

experiencing rapid economic and social changes, which include vast conflicts of

interests in the society. According to Jha, " rapid growth shortens the time period

within which social and political adjustments have to be made. Therefore, the more

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[24] http://en.falundafa.org/
[25] Notoriety Now for Exiled Leader of Chinese Movement. The New York Times.
http://partners.nytimes.com/library/world/asia/042799china-protest-leader.html
[26] China Bans Falun Gong. People's Daily.
http://english.people.com.cn/special/fagong/1999072200A101.html

the growth accelerates, the more does it become a political and not merely an

economic challenge" (2009, 7). Carroll also writes, "the price of rapid growth is rapid

change, and the drawback of rapid change is that it is inexorably associated with

uncertainty"(2010, 8). Living in an unstable environment full of uncertainty and

insecurity, saving became a rational way for self-protection. As seen in Figure 5.9,

the pattern of national savings rate in China for 1996–2010 basically mirrors the

pattern of perceptions of political stability. The low points in political stability

matched the high points in national savings rate. The perceptions of political stability

declined markedly in the 2000s, and plummeted in 2010 with a score of -0.76

Figure 5.9 National Savings Rate and Political Stability (Right Axis) in China, 1996-2010
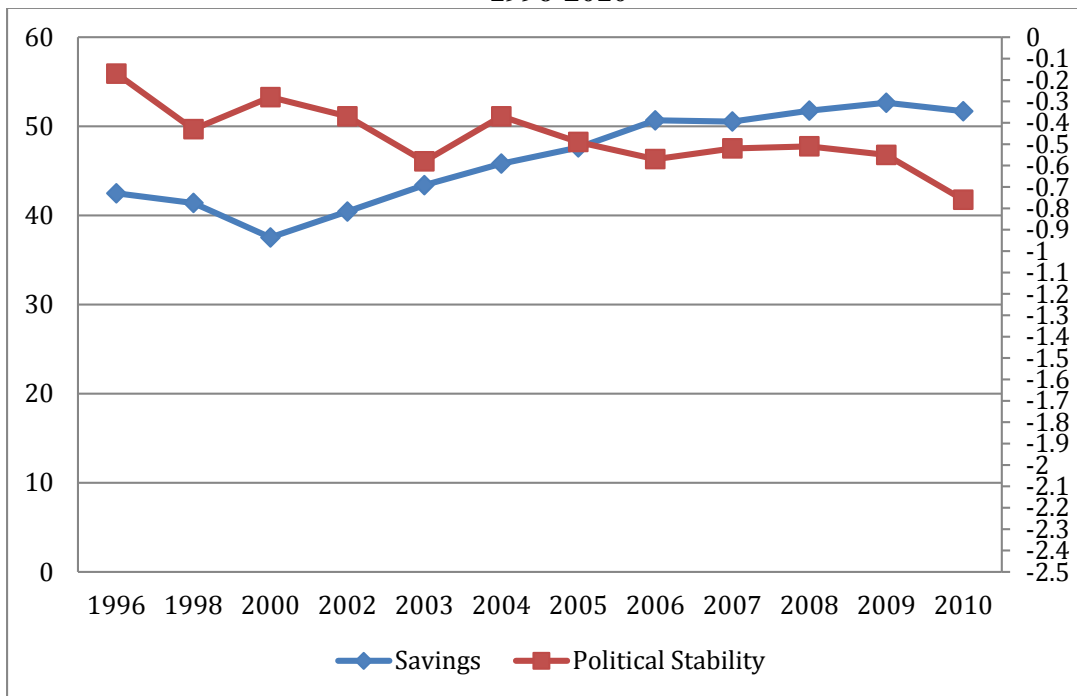
Source: World Bank Worldwide Governance Indicators
(http://data.worldbank.org/data-catalog/worldwide-governance-indicators

During the same period, the national savings rate in China increased significantly in

the 2000s, and peaked in 2009-2010 with savings rates around 52 percent of GNI.

There is a strong correlation between the savings rate and the Chinese's perceptions of political stability.

Since Japan does a better job than China in regulatory quality and political stability, why is Japan's savings rate lower than China's? While political stability and high regulatory quality facilitate economic development and savings, there is another possible explanation of the relationship between political factors and savings on the individual level. Rational choice theory assumes that individuals are motivated by their self-interests (Downs 1957; Olson 1965). Rationalists also assume that individual behavior is influenced by a range of constraints. One of the most important constraints relate to institutions and organizations. Institutions are "sets of rules that structure social interaction and whose existence and applicability are commonly known within the relevant community" (Levi, 25). As to organizations, they "affect what information and payoffs are available to the relevant actors" (Levi, 26). In a broad sense, institutions and organizations constitute the decision-making environment. Political environment and government regulation exert an influence on people's saving behavior. For example, in a high-risk environment rife with inefficiency and corruption, in the absence of freedom and justice, rational individuals set aside a certain amount of resources for precautionary purposes. The extraordinary transformation of economic life in China over the past 30 years has fostered a sense that the future is full of changes. And the political environment and inefficient governance aggravate that sense of insecurity. Facing higher uncertainty about the future, Chinese reduces current consumption and raises saving.

In short, China's experience over the past 30 years is in many ways a close replica of the experiences of Japan that went down the same path earlier. Japan preceded China in, first, embarking on a path of rapid and sustained economic growth and, as growth continued, in racking up ever-higher savings rates (Carroll 2010). However, Japan's savings rate has declined since the mid-1970s. The reason of the decline is that the "the factors that caused Japan's household savings rate to be high until the mid-1970s gradually became less applicable after the mid-1970s" (Horioka 2007, 14). "The factors" mainly include the high growth rate of income, the unavailability of consumer credit, and the low level of public pension benefits (Horioka 2007). The fact that China's national savings rate is much higher than Japan's national savings rate in recent years is because that some of the same factors are still applicable to China, such as remarkably high GDP growth rate, stringent borrowing constraints, and limited pension benefits. Moreover, when these factors interact with gender imbalance, political instability, and poor regulatory quality, the Chinese's precautionary savings are largely boosted.

The Decomposition of China's National Savings

The national savings rate is comprised of the savings rates of three sectors: households, firms, and government. Thus, the national savings rate can rise either because the savings rate within one or more sectors rises, or because a high saving sector expands while a low-saving sector contracts (Yang 2012). While it is well-known that China's national savings rate is astonishingly high, we actually don't know who is saving. To better understand the high level of Chinese saving, it is useful to examine the breakdown of China's gross national saving by its components:

household, corporate, and government saving (Bayoumi, Tong, and Wei 2010; Kraay 2000; Kujis 2006; Ma and Yang 2013; Ma and Yi 2010b; Yang 2012). The discussion will be based on China's flow-of-funds data, which provides the breakdowns of gross national saving by sector starting from 1992.

Figure 5.10 The Composition of China's National Savings (percent of GDP), 1992-2010
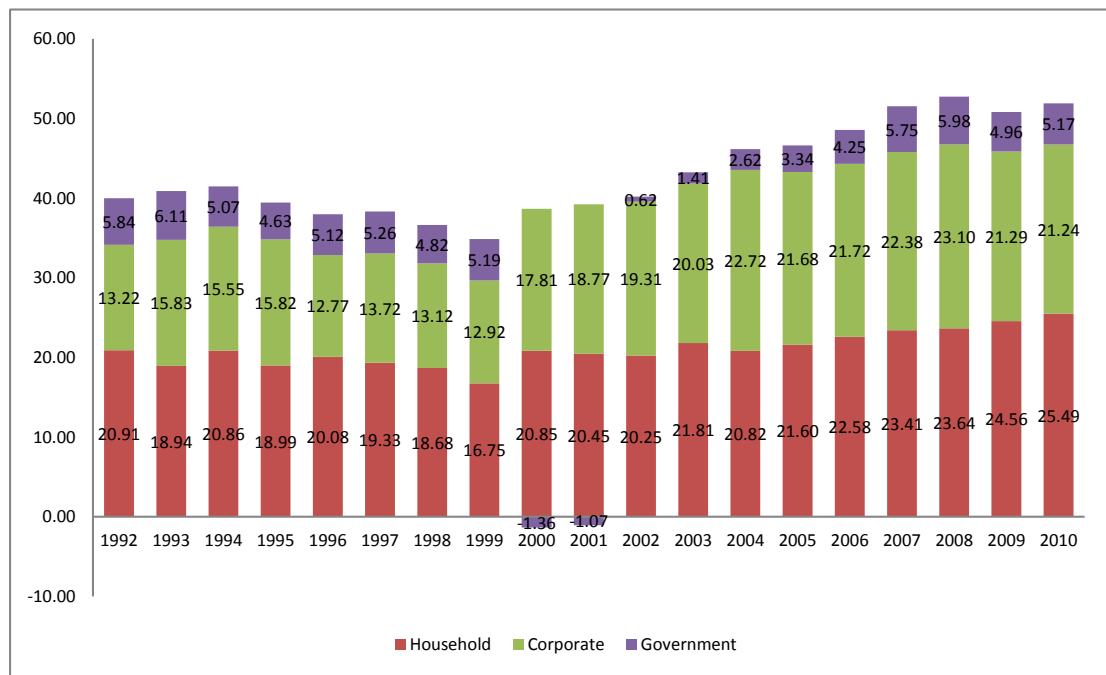
Source: China Statistical Year Book (2013, 2012, 1999)

Table 5.3 The Changes of China's National Savings (percent of GDP), 1992-2010

Year	Household	Corporate	Government	Total
1992-2010	4.58	8.01	-0.67	11.93
1992-1999	-4.16	-0.30	-0.65	-5.11
2000-2010	4.65	3.43	6.53	14.60

Sources: China Statistical Year Book (2013, 2012, 1999); author's estimate

Table 5.4 Savings Distribution in China

Year	Household	Corporate	Government	Total
1992	52.31%	33.08%	14.61%	100.00%
1993	46.32%	38.72%	14.96%	100.00%
1994	50.29%	37.50%	12.21%	100.00%
1995	48.15%	40.11%	11.74%	100.00%
1996	52.88%	33.65%	13.47%	100.00%
1997	50.46%	35.82%	13.73%	100.00%
1998	51.00%	35.83%	13.17%	100.00%
1999	48.04%	37.06%	14.90%	100.00%
2000	55.89%	47.75%	-3.64%	100.00%
2001	53.61%	49.19%	-2.81%	100.00%
2002	50.39%	48.06%	1.54%	100.00%
2003	50.43%	46.32%	3.25%	100.00%
2004	45.11%	49.22%	5.67%	100.00%
2005	46.34%	46.50%	7.16%	100.00%
2006	46.51%	44.73%	8.76%	100.00%
2007	45.42%	43.42%	11.16%	100.00%
2008	44.84%	43.81%	11.35%	100.00%
2009	48.33%	41.90%	9.76%	100.00%
2010	49.12%	40.92%	9.96%	100.00%

Sources: China Statistical Year Book (2013, 2012, 1999); author's estimate

Figure 5.10 shows the composition of China's national savings. Table 5.3 presents the changes of China's national savings from 1992 to 2010. Table 5.4 shows the shares of corporate, household, and government saving in national saving during the same period. Three observations are worth highlighting. First, the household sector is the largest saver today, contributing about 49 percent of the national savings in 2010 (Table 5.4). Second, the corporate sector has been the principal driver behind the rise in the aggregate savings rate during 1992-2010 (Table 5.3). Third, the year 2000 is a turning point when the aggregate Chinese savings rate started its skyrocketing climb of 15 percentage points, as a share of GDP (Figure 5.10 and Table 5.3). Almost half of this increase so far in the 2000s has come from the government

sector (6.53 percent). The reasons the year of 2000 is a turning point will be explored later in this section.

Corporate Savings

Corporate savings are the profits that are not paid out as dividends. China's corporate saving increased from 13 percent of GDP in 1992 to a peak of 23 percent of GDP in 2008, but has since trended down to 21 percent in 2010 (Figure 5.10; Table 5.3). During the period of 1992-2010, corporate saving contributed about 67 percent of the increase in the Chinese aggregate saving. The rise in the corporate savings is mainly due to two reasons: the enterprise reform that began in the late 1970s and the Chinese government's distortions and subsidies.

The Enterprise Reform. Starting from the late 1970s, China went through its toughest corporate reform but also reaped remarkably high corporate profits. In 1978, the Chinese authorities began to separate SOEs from government departments and to give their managers greater autonomy in making business decisions. Several innovative, market-oriented methods were introduced to motivate SOEs and improve efficiency, such as the Dual Price system[27]. Beginning in the mid-1990s, authorities began a comprehensive overhaul of the SOE sector, named "*zhuada fangxiao*" (grasping the largest while letting go the smaller). On one hand, small and medium-sized state firms owned by local governments were privatized or closed down; on the other hand, the largest, mostly central government-owned state firms were kept under state control (Naughton 2007; Ho and Young 2013; Geng, Yang, and Janus 2009).

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[27] The existing planned price for within-the-quota output and the new market price for above-the-quota output. If enterprises exceeded their production quotas, they were allowed to sell their products outside the state plan at as much as 20 percent above the state price. This was referred to the Dual Price (Dual Track) System.

Most of these large firms concentrated on energy and natural resources. Between 1995 and 2001, the number of SOEs fell by 60 percent (OECD 2009, 42). Nearly 45 million SOE workers—nearly one-third of total SOE employment prior to the reform—were laid off from 1998 to 2003 (OECD 2009, 43). In addition, the remaining SOEs stopped providing basic social services to their employees. The "iron rice bowl" , the traditional lifetime job guarantee system with basic social services, was smashed. Laid-off workers were channeled into re-employment centers providing temporary income support and job-search assistance. However, they experienced dramatic reductions in their income and standard of living. For example, laid-off workers in the province of Heilongjiang received stipends from their re-employment centers equal to only 6 percent of the average SOE wage in 1997, compared with 43 percent in Shanghai (Naughton 2007, 188). Large-scale protests erupted in Heilongjiang, and eventually the central government was forced to step in and share some of Heilongjiang's pension obligations. As a result, the corporate restructuring directly reduced SOEs' cost, enhanced corporate efficiency, and increased job insecurity, lifting both corporate and household saving.

The corporate reform also facilitated the privatization of enterprises. By 2001, the private sector had surpassed the public sector in contributing to real GDP: it accounted for nearly 55.5 percent of total output and 51.8 percent of the non-farm sector, compared to the 35.7 percent and 37.1 percent, respectively, contributed by SOEs (OECD 2009, 42). In 2004, the Chinese Constitution was amended to guarantee

private-property rights. [28] In the Fourth Amendment of the Chinese Constitution,

Article 11 states,

> The State protects the lawful rights and interests of the non-public
> sectors of the economy such as the individual and private sectors of
> the economy. The State encourages, supports and guides the
> development of the non-public sectors of the economy and, in
> accordance with law, exercises supervision and control over the
> non-public sectors of the economy. [29]

The private sector is currently the fastest growing part of China's economy. As a

result, "efficiency gains from corporate restructuring and an expanding indigenous

private sector have intensified competition, raised productivity, and helped drive fast

economic growth, deliver cost saving and lift corporate profits" (Ma and Yi 2010b,

18). The enterprise reform also helped explain why increases in China's savings rate

have exceeded those elsewhere in East Asia in the 2000s.

Government regulation. The rising enterprise savings are also attributable to

government distortions and subsidies. To increase the industrial competitiveness of

the enterprises, the Chinese government implemented many policies that

characterized the central planning era, such as low-interest payments on loans to

SOEs, and low land rentals to subsidize enterprises. For example, SOEs financed

their loans and paid their debts at interest rates significantly lower than the prevailing

market rates. In addition, the Chinese government did not ask SOEs to pay dividends

until 2007, although they have enjoyed improved profits since the state sector

restructuring in the late 1990s. As a result, a large portion of profits is retained, lifting

the savings rate. Moreover, the government also removed much of the social

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[28] Constitution of the People's Republic of China was adopted on December 4, 1982, with further
revisions in 1988, 1993, 1999, and 2004.
[29] Constitution of the People's Republic of China.
http://english.people.com.cn/constitution/constitution.html

responsibilities that SOEs previously held and placed them on the shoulders of local governments. However, the private enterprises don't have the privilege of enjoying the low-interest loans. The borrowing constraint is very severe for small and medium-sized enterprises. As mentioned before, they have to rely on their own savings to meet their funding needs. "Credit creation in China is mostly controlled by state banks, which have an intrinsic bias in favor of state-owned enterprises" (Yang 2012, 134). The major driver of the enterprise saving, to a large extent, is the Chinese government's regulation and policies.

Household Savings

Household saving is generally defined as the difference between household disposable income and household consumption expenditures. According to the flow-of-funds data, the household sector is the largest saver in China. However, household saving fell from 21 percent of GDP in 1992 to a low of 17 percent in 1999 before staging a marked comeback to 26 percent by 2010 (Figure 5.10; Table 5.3). During the period of 1992-2010, the household sector contributed about five percentage points of the 12-percentage point rise in China's aggregate savings rate.

Precautionary Savings. The high and rising household savings rate has been a subject of intense research (Qian 1998; Kraay 2000; Modigliani and Cao 2004; Horioka and Wan 2007; Chamon, Liu, and Prasad 2010). Precautionary saving motives are often-cited factors accounting for the high household savings (Meng, 2003; Blanchard and Giavazzi, 2005; and Chamon and Prasad 2008). Indeed, the panel data study showed that limited social services, borrowing constraint, gender

imbalance, and political instability all encouraged Chinese households to save rather than consume.

Limited social services are one of the strongest candidates for explaining the increase in household savings rates, especially during a transition period from central planning to a market economy. As discussed above, the large-scale corporate restructuring and downsizing increased both job insecurities and income uncertainties and weakened the enterprise-based social safety net, thus strengthening the precautionary motives to save. Additionally, "the new social service system has been taking shape but did not expand fast enough to offset the holes created by a shrinking enterprise-based social safety net" (Ma and Yi 2010b, 25). As discussed before, the 1997 pension reform transformed the previous pay-as-you-go system to a partially funded three-pillar scheme. The new program reduced pension benefits, increased contributions and introduced pre-funded individual pension accounts. Comparing China and India's social sector, Bardhan writes, the social sector is "one area where the Chinese differential advance was achieved in the socialist period and, if anything, the period of market reform has eroded some of this advance" (2007, 104). Reduced pension wealth and increased health care costs may have helped to lift the household savings rate in China.

Income disparity. It is widely acknowledged that income inequality has risen sharply in China with its economic growth (Li, Sato, and Sicular 2013; Riskin, Zhao, and Li 2001). With the rise of a class of economic elite, a huge group of low-skilled workers has also been created. Moreover, a new, relatively prosperous middle class

has also emerged. Figure 5.11 shows the savings rates of four different income

groups. The savings rates of the lowest income group fluctuated around 0.05,

Figure 5.11 Urban Household Savings Rates by Income Levels, 1988-2007
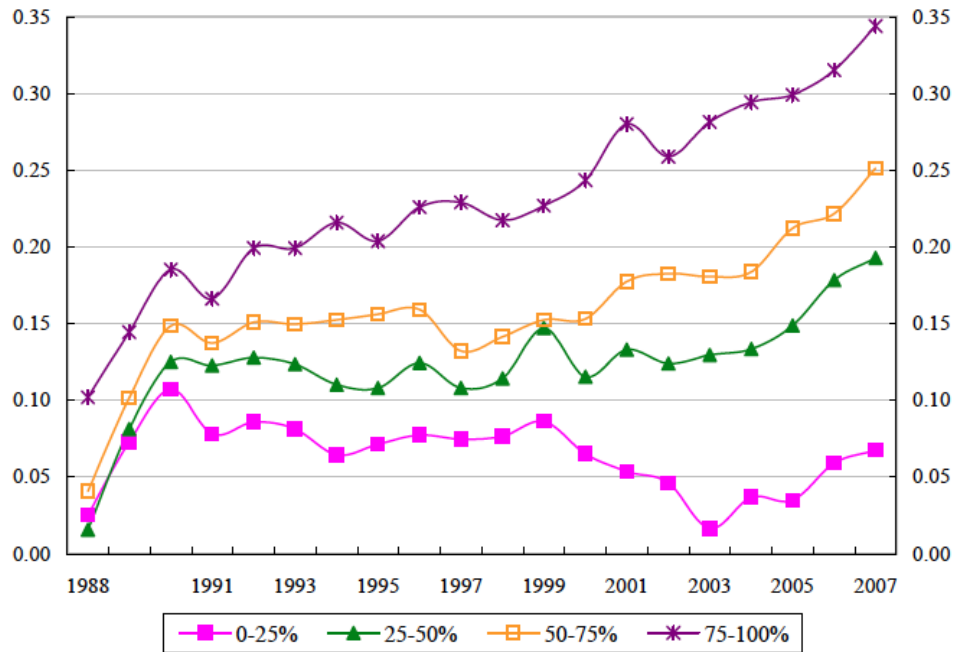
Source: Yang, Zhang, and Zhou (2012)

ending at 0.07 in 2007. In contrast, the savings rate of the highest income quartile

started at 0.1 in 1988 and increased to about 0.34 in 2007, a level that is 27

percentage points higher than that of the lowest income group. This positive

relationship between income and savings rate is consistent with the findings of the

panel data study. However, it also indicates that the high-income group is saving the

most, and the income disparity and a higher concentration of wealth among the rich

tend to increase the household savings.

Culture. Some scholars contend that culture is one of the major reasons for

the high savings ratio in East Asia (Hofheinz and Calder 1982; Zhou 2009). Zhou

(2009) ascribes high savings rates in East Asia, in a large part, to Confucianism which

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"values thrift, self-discipline, zhongyong or Middle Ground (low-key), and anti-extravagancy" (Zhou, 2009). It is also argued that culture explains why Latin American countries have similar levels of GDP as the East Asian countries but lower savings ratios. Hofheinz and Calder (1982) also contend that Confucianism affects East Asians' attitudes toward accumulation. Confucian philosophy, with its emphasis on proper behavior and respect for one's position in life, hails prudence and frugality, demands sacrifice for future enjoyment, and condemns parents who failed to provide for their offspring (Hofheinz and Calder 1982).

According to an urban depositor survey conducted by the People's Bank of China in March 2014, while 34 percent of interviewees would like to have more investment, 47.6 percent of interviewees prefer to have more savings deposits. Based on another survey conducted by McKinsey Global Institute, when interviewees are asked to choose a preferred payment method when monthly income is insufficient to cover a purchase, 48 percent of respondents chose to use savings, 37 percent chose to borrow from friends or family, and only 20 percent would use their credit cards.[30]

While the effect of culture on savings rate is recognized, the validity of the cultural argument has also been questioned (Garon 2011; Guo and N'Diaye 2010; Modigliani and Cao 2004). As proof, Garon pointed out that the Chinese people were "terrible savers" (Garon 2011, 312) from the 1950s to the 1970s although they save a lot now. However, some scholars find that a large part of China's savings rate remains unexplained even after accounting for many factors (Kraay 2000; Hung and Qian 2010). There still may be some room for culture, but it is unlikely to be the

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[30] McKinsey Global Institute China Urban Consumer Savings Behavior Survey, April 2009, n=994.

dominant factor (Harbaugh 2004). Because culture is an unobserved variable, there is no empirical evidence on the relationship between culture and China's savings rate.

Government Savings

Although the government is the smallest saver in China (Table 5.4), it contributed half of the 15-percentage point rise in China's savings rate during the 2000-2010 period (Table 5.3; Figure 5.10). In 1994, the Chinese government enacted a sweeping reform of the fiscal system. The fiscal reform had three crucial elements: new taxes, a tax assignment and sharing system, and a new central government taxation agency (Naughton 2007). The most important of the new taxes was the value added tax (VAT) levied on most manufactured goods at a uniform rate of 17 percent. The VAT revenues are designated as shared income, with 75 percent going to the central government and 25 percent to the local government. In addition, a profit tax and a consumption tax were introduced. Moreover, a new central government taxation authority was created. Under the new system, the central government first collected the bulk of revenues and then shared them with the provinces. Under the old system, local governments collected nearly all the tax revenues and then transferred a negotiated percentage to the central government. The reform dramatically boosted the government's revenue, especially the central government's share (Figure 5.12). According to the National Bureau of Statistics, national government revenue increased about 15 times from 1994 (522 trillion yuan) to 2010 (8310 trillion yuan) (National Bureau of Statistics of China 2013). Moreover, in 1994, the revenue of the central government exceeded that of local governments for the first time since 1978.

Figure 5.12 National Government Revenue of China (100 million yuan), 1980-2012
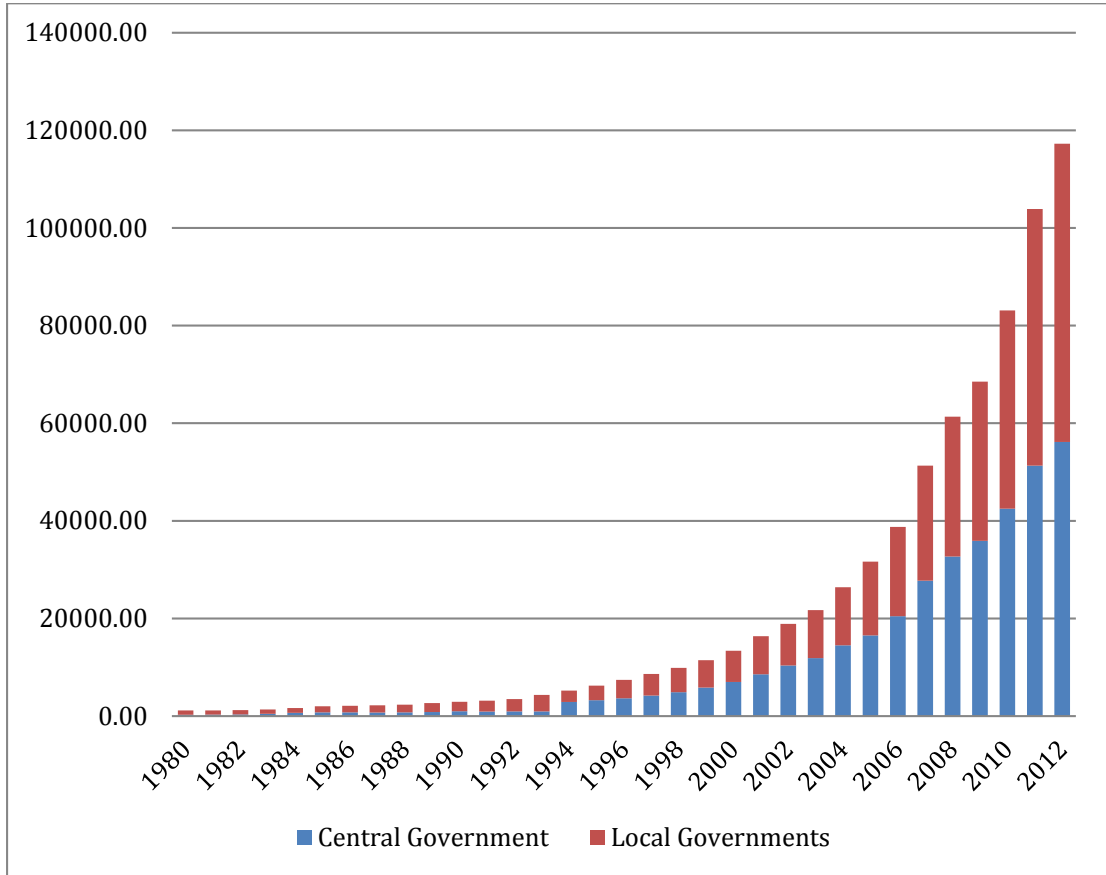
Source: China Statistical Year Book 2013

Additionally, high government savings have also been the result of the growth-oriented economic policy emphasizing investment. The promotions of local government officials have been mainly determined by performance indicators such as GDP. For example, in the performance target of Changtai County, Fujian Province, economic growth is the main focus, and performance indicators were centered on outputs as well as determinant factors leading to GDP growth like the volume of outside investment and the tax revenue (see Table 5.5). Since the early 1980s the promotion of Chinese local officials has been significantly linked to the GDP growth in their jurisdictions (Chen, Li, and Zhou 2005; Li and Zhou 2005). For a given

amount of government revenues, local officials tend to invest more rather than to provide additional public services, thus facilitating government savings (Ma and Yi 2010b).

Table 5.5 Performance Targets for a Township Government in China
(Changtai County, Fujian Province), 1999

Dimensions	Targets	
	Task	Weight
1. Agriculture		100
1) Total value of production (in million yuan renminbi)	184	10
2) Structural adjustment		25
Banana planting (in hectares)	1 050	
3) Fruit production (in tons)	22 200	10
4) Mushroom planting		25
Hectares	110	
Volume of production (tons)	11 800	
5) Number of pigs provided (in thousands)	25.6	20
6) Aquiculture production (tons)	790	10
2. Private and small business development		100
1) Construction of development zone for private and small businesses		40
Number of new businesses	4	
Total volume of investment (in thousand yuan renminbi)	2 000	
2) Private businesses with investment above CNY 100 000		60
Number of new businesses	16	
Total volume of investment	240	
3. Outside investments		100
1) Production value by joint ventures (in million yuan renminbi)	62	15
2) Volume of foreign investment in contract (in thousand United States dollars)	7 500	30
3) Volume of foreign capital invested (in thousand United States dollars)	3 500	20
4) Number of new enterprises by overseas investors	3	20
5) Number of new businesses above CNY 500 000 by investors outside the region	2	15
4. Fixed assets investment		100
1) Volume of investment (in thousand yuan renminbi)	23 000	20
2) Volume of investment by key projects (in thousand yuan renminbi)	5 000	80
5. Tax revenue		100
1) Volume of tax revenue		80
2) Contribution to the county		10
3) Tax revenue per capita		10

Source: Burns and Zhou (2010)

In this chapter, the findings of the panel data study are tested China's case. It turns out that the factors identified in the quantitative study are applicable to China. The fact that China's national savings rate is high (even higher than its high-saving East Asian neighbors) is due to China's remarkably high GDP growth rate, low GDP per capita, stringent borrowing constraints, gender imbalance, limited social services, political instability, and poor regulatory quality.

In addition, China's national savings is analyzed by its components: enterprise, household, and government savings. In terms of the share in the aggregate savings, the household sector is the largest saver. In terms of the increasing rate, the corporate sector has the highest increasing rate during 1992-2010. However, starting from 2000, almost half of the rise in the aggregate savings has come from the government sector. Yang writes,

> Due to a set of institutional rules that centered on export promotion and that favored firms and government over the household sector, a high percentage of this windfall gain of profits was either saved in the corporate sector or was collected by the government, which has not accordingly adjusted its social welfare spending upward. The result was an extraordinary upsurge in aggregate savings, along with weak domestic consumption and anemic demand for imported goods (2012, 125).

All of the three sectors—enterprise, household, and government—have contributed to the high aggregate savings rate in China. However, the real driver behind the high aggregate savings rate is the Chinese government. It's the government's regulations that have favored investment and export at the expense of consumption. It's the government's policies that facilitated economic growth at the expense of people's welfare. Political and governmental factors do exert an influence on a country's economic development and individuals' savings behavior. The government's investment and export-oriented policy worked in China. China's economy had been growing at a remarkably high rate of ten   of GDP between 1980 and 2010. However, rapid economic change also leads to vast conflicts of interests, generating a sense of insecurity and instability. Moreover, the social service system and the financial system are still in an early stage of development. The joint effects of

economic factors, demographic factors, and political and governmental factors

produced China's high savings rate.

Why is there a noticeable spike in the Chinese savings rate since 2000? First,

the Chinese economy had been growing for more than a decade. Second, a number of

major institutional reforms started in the mid or late 1990s have significantly

influenced the Chinese saving trends, such as the 1994 fiscal reform, 1997 pension

reform, and 1998 corporate restructuring and downsizing.

CHAPTER 6 CONCLUSION

Why is China's savings rate so high? This is the research question of this dissertation. It seems an economic question; however, it is more than an economic question. Through the lens of savings rate, many issues of China's development are presented, such as limited social services, undeveloped financial system, inefficient government, and gender imbalance.

Review of Findings

In this study, I used a mixed-methods approach to explore the factors that have driven China's high savings rate. First, a panel data study covering 91 countries from 1980 to 2010 is conducted to figure out the reasons why different countries have different savings rates. I found that the main determinants of savings rates include GDP per capita, GDP growth rate, borrowing constraints, gender imbalance, social services, political stability, and regulatory efficiency. Second, a comparison of China and Japan is conducted. The findings found to be most significant in the panel data study are applied to China and Japan's cases. And the results of the comparison basically confirmed the findings of the panel data study (see Table 6.1). Additionally, to further explore the sources of China's high savings, national savings are broken down into three parts: enterprise, household, and government savings. While the household sector is the largest saver today, the corporate sector and the government sector made a greater contribution to the rise in the aggregate savings between 1992 and 2010.

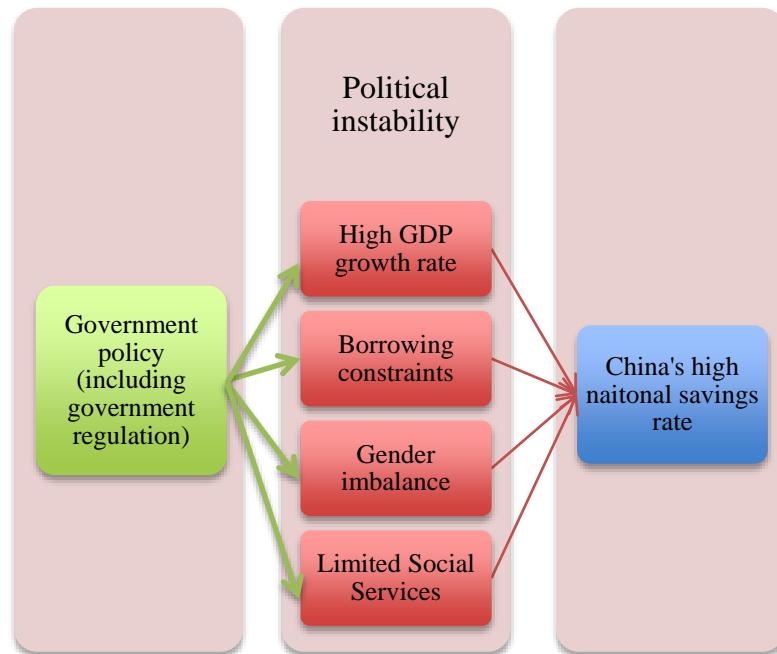## Table 6.1 An Overview of Research Findings

Research Question: Why is China's Savings Rate so High?	Hypothesis	Support of the Panel Data Study	Support of the Comparison between China and Japan
Economic Factors	H1: The higher a country's per-capita income, the higher the national savings rate is likely to be.	**Yes**	**Yes**
	H2: The higher a country's growth rate, the higher the national savings rate is likely to be	**Yes**	**Yes**
	H3: The more stringent a country's borrowing constraint, the higher the national savings rate is likely to be.	**Yes**	**Yes**
Demographic Factors	H4: The higher a country's age-dependency ratio, the lower the national savings rate is likely to be.	**No**	
	H5: The higher a country's level of urbanization, the lower the national savings rate is likely to be.	**No**	
	H6: The higher a country's percentage of female population in the total population, the lower the national savings rate is likely to be.	**Yes**	**Yes**
Political Factors	H7: The more comprehensive a country's social safety net, the lower the national savings rate is likely to be.	**Yes**	**Yes**
	H8: The more democratic a country is, the lower the national savings rate is likely to be.	**No**	
	H9: The higher the level of political stability in a country, the higher the national savings rate is likely to be.	**Yes**	**Partial Support**
	H10: The higher the regulatory quality in a country, the higher the national savings rate is likely to be.	**Yes**	**Partial Support**
	H11: The more effective the control of corruption in a country, the higher the national savings rate is likely to be.	**No**	

In short, all of the three sectors—enterprise, household, and government—

have driven up the savings rate in China, but the real driver behind the high aggregate

savings rate is the Chinese government (Figure 6.1). It is the government's

investment and export-oriented policy that has stimulated China's rapid economic

growth. It is the government's strict banking regulation and SOEs-centered policies

that have imposed tight borrowing constraints on individuals and SMEs. It is the

government's One-Child policy that has resulted in a gender imbalance in China. It is

also the government's decision to remove corporations' responsibility to provide

social services that has increased households' precautionary savings. Moreover, rapid

economic and social change also brings about vast conflicts of interests. Living in an

unstable environment full of uncertainty and insecurity, saving is a natural way to

survive. China's high savings rate is systemic—the product of a series of economic

policies that have prioritized investment over household income and consumption.

Political and governmental factors indirectly affect a country's savings rate.

This study adds to the current literature by utilizing a newer and larger panel

data of 91 countries over the time span from 1980 through 2010 (Hung and Qian

2010; Loayza, Schmidt-Hebbel, and Servén 2000b). In addition, this study provides a

new perspective to study China's high savings rate. Although numerous studies about

savings have been published, this work has been mainly focusing on economic factors

of savings rate. In this dissertation, several new explanatory variables—regime types,

political stability, regulatory quality, and control of corruption—are added to explore

the effects of political and governmental variables on savings rates. It turns out that

political stability and government regulation do exert an influence on a country's economic performance and individuals' saving decisions.

Figure 6.1 A Model of China's National Savings Rate

Political instability

Government policy (including government regulation)

High GDP growth rate

Borrowing constraints

Gender imbalance

Limited Social Services

China's high naitonal savings rate

Approaches to Promote Consumption and Rebalance China's Economy

Identifying the causes of China's high savings rate could shed light on approaches to stimulate domestic consumption. Based on the findings of this dissertation, to promote domestic consumption and restructure the economy, China needs to improve its financial system and social service system. In addition, the Chinese government should find its appropriate role in economic development.

Improve China's Financial System

As discussed above, China's financial system still has many problems, such as an undeveloped consumer loan market, very limited SME access to capital, and a highly regulated banking system. To rebalance its economy, the Chinese government should improve the access of individuals and SME to credit and increase competition

in the banking sector. In terms of the consumer credit, the availability of consumer loans has a direct impact on consumption by helping households to purchase big-ticket items. Consumer loans can also help households cope with adverse shocks, reducing the need to save for precautionary motives. The payroll loans programs in Latin America are a good example of reforms to raise access to finance. [31] Under the payroll loans system, banks first offer credit to individuals and then get repaid through an automatic deduction of individuals' paychecks, increasing the likelihood of repayment. These often small and relatively low-risk loans can help banks decide whether to deepen their relationship with a borrower. Regarding the risk to the financial system, the cost of creating payroll loan programs is very small (Chamon and Chandra 2011). A natural strategy for China could be to start with public sector workers, where the government is in a good position to control the wage stream (Chamon and Chandra 2011). Payroll loans might help the Chinese households finance consumption expenditures and reduce precautionary savings.

Strengthen the Social Service System

It has often been argued that the high level of household savings has resulted from the "rising private burden of expenditures on housing, education, and health care" (Chamon and Prasad 2008, 1). Since the beginning of the reform era, large changes in the funding and delivery of social services such as health care and pensions have undermined both the quantity and quality of benefits provided to Chinese citizens. China needs to shift more of the growing burden of paying for health care back to the government. China should also expand the coverage,

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[31] The Wall Street Journal. Latin America's New Credit Frontier.
http://online.wsj.com/articles/SB10001424127887323689604578222130866020660

reliability, and efficiency of the pension system to boost consumption. Reducing the uncertainties about the social provision will significantly lessen the strong precautionary saving motive and give households the confidence to increase their consumption. But improving China's social service system is more than a crucial step forward to boost consumption (Woetzel et al. 2009). Expanded public provision will help guard against the potential for sociopolitical instability that may result from the inequities engendered by the rapid economic growth that China is experiencing today. Over the long term, higher quality health-care and pension systems that provide benefits for a greater share of China's populace will foster a healthier and more productive society, contributing to productivity gains and further improving China's growth prospects.

The Role of the Chinese Government

As China moved from a command toward a market economy, government commands and central planning have been greatly reduced in scope, but they have not disappeared altogether. National and local bureaucrats continue to exercise a great of control over the production and distribution of resources, goods, and services, and the state still wields the power to make economic policy. As discussed above, China's rapid growth in recent years has depended on a development model that has rested heavily on government investment and exports. Generally, the Chinese government has followed the same path as the other East Asian states and regions, including Japan, South Korea, and Taiwan (Lardy 2007; Carroll 2010). During their periods of most rapid economic growth, all had strong, highly interventionist, and developmentally oriented states—the so-called "developmental state" (Leftwitch

1995; Woo-Cumings 1999). Chinese aspects of this developmental state include a priority of economic development, government support of heavy industry, capital intensive, export-oriented industrialization, the legacy of central planning. China's investment-led, industry-centered policy and its emphasis on exports have favored corporations and crowded out consumption.

Rebalancing China's economy requires "active involvement by the government in the form of policy changes and reforms" (Aziz and Dunaway 2007, 30). Markets in China are still immature and prices do not reflect true supply and demand conditions. Instead, they are influenced, to varying degrees, by the government. To promote domestic consumption and restructure China's economy, the Chinese government should redistribute some of the benefits of economic progress from rich to poor as well as from corporations to households. Desirable policy reforms include restoring the prices of resources and capital to market values; breaking up state monopolies in industries such as financial services and natural resources; supporting the development of SMEs; and shifting investment to labor-intensive service sectors. China also needs to review the population control policy in the context of the gender imbalance and the anticipated rise in the old dependency ratio over the following decades. [32]

Limitations of the Study

First, there is a lack of objective indicators of some political variables in this study. The data source for two political variables, political stability and control of corruption, is the World Banks's Worldwide Governance Indicators (WGI). WGI

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[32] In November 2013, following the Third Plenum of the 18th Central Committee of the Chinese Communist Party, China announced the decision to relax the one-child policy. Under the new policy, families can have two children if one parent is an only child.

combines the views of a large number of enterprise, citizen and expert survey respondents in industrial and developing countries. They are based on 37 individual data sources produced by a variety of survey institutes, think tanks, non-governmental organizations, international organizations, and private sector firms. In this study, political stability is measures as "perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including politically-motivated violence and terrorism." And control of corruption is indicated as "perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as 'capture' of the state by elites and private interests." However, there is "a substantial difference between measuring a thing and measuring perceptions of it" (Thomas 2009, 36). For example, perceptions of corruption have been shown to differ from actual corruption levels; and trust in government has been shown to differ from administrative performance (Thomas 2009). In addition, it is argued that the individual indicators underlying the WGI may be biased towards the views of business elites. For example, several of WGI's data sources are commercial risk rating agencies. While businesspeople prefer low taxes and minimal regulation, the public demands reasonable taxation and public services. Estimates of governance based on the perceptions of businesspeople therefore may be biased (Arndt and Oman 2006).

The second limitation is that there are a limited number of low-income countries included in the sample of the panel data study. Based on data availability, 91 countries and a time period from 1980 to 2010 are selected (see Table 3.2). As mentioned in the methodology chapter, among the 91 countries, based on the World

Bank's classification, there are 27 high-income countries, 25 upper-middle-income countries, 25 lower-middle-income countries, and 14 low-income countries. Wealthier countries are included in this study mainly because these countries generally have better resources and infrastructure for assembling and publishing national data. However, it is possible that the findings of the panel data study lack generalizability to the low-income countries. It is anticipated that a dataset with more countries would help the model to perform better. However, this was not an option since many low-income countries don't have data on savings rate and/or the explanatory variables.

Future Research Directions

This research represents probably the first attempt to systematically study the political factors of savings rate. However, it would be unreasonable to expect this single study to reap definitive answers. Additional research clearly is needed on an issue as pressing as China's economic development and savings rate. To be sure, this dissertation raises several interesting research questions and offers some directions for future studies.

Many of the operational definitions used in this study are new. Future studies of the political factors of savings rate can build upon this one by developing their own measures for some of the concepts in the model. One promising candidate is the concept of political stability. As mentioned in the literature review, there is still a lack of consensus on the definition of political stability. Moreover, Zheng (2012) used a total of 12 sets of publically available indices to measure political instability (see Table 5.3). In this study, I used the data from the World Bank's Worldwide Governance Indicators to measure political stability. Although it is statistically

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significant in the panel data analysis, it is not in the expected direction. Trying other measures of political stability might produce valuable results.

Future research can also probe other factors that drive China's high savings rate, for example, income equality. It is widely acknowledged that income inequality has risen sharply in China since the reform period began at the end of 1970s (Khan and Riskin 2005; Li, Sato, and Sicular 2013; Riskin, Zhao, and Li 2001). However, many countries don't have open data on income equality, and therefore income inequality is not included in the model of national savings rate. While some studies find positive and significant effects of personal income inequality on aggregate saving (Cook 1995), other studies do not (Valle and Oguchi 1976; Edwards 1996; Schmidt-Hebbel and Serven 2000). Taken together, these literatures imply that the overall impact of inequality on aggregate saving is ambiguous. As to China, Naughton (2007) claimed that there is no other case where a society's income distribution has deteriorated so much, so fast as China. The enormous income disparity pushes the Chinese to save for the unsecure future. The high savings rate in China, to some extent, represents exactly the tension between the dominant groups and the subordinate groups. Yang (1999) argued that urban-biased policies and rural-urban income differentials have been the driving factor behind the rising inequality in China. Jin, Li, and Wu (2011) proposed another potential explanation for the inequality–savings link at the household level: people's desire to improve their social status. They contend that people save to improve their social status, which is associated with pecuniary and non-pecuniary benefits. Rising income inequality can strengthen the incentives of status-seeking savings by increasing the benefit of

improving status and by enlarging the wealth level required for status upgrading. It is expected that the larger the level of income inequality, the higher the national savings rate is likely to be.

It will also be very intriguing to do a comparison of China and India's savings rates. China and India are two emerging Asian powers that have many commonalities such as a huge population, a long history, rich cultural traditions, Western colonial legacy, and high growth rate. However, India's savings rate is not as high as China's (see Figure 1.1). In 2012, while China's national savings constituted 51percent of its national income, India's national savings took up 31percent. Since China and India have so many similarities, why India's savings rate is much lower? With these two cases, China and India, a most similar system can be built to explore the reasons behind China's high savings rate.

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