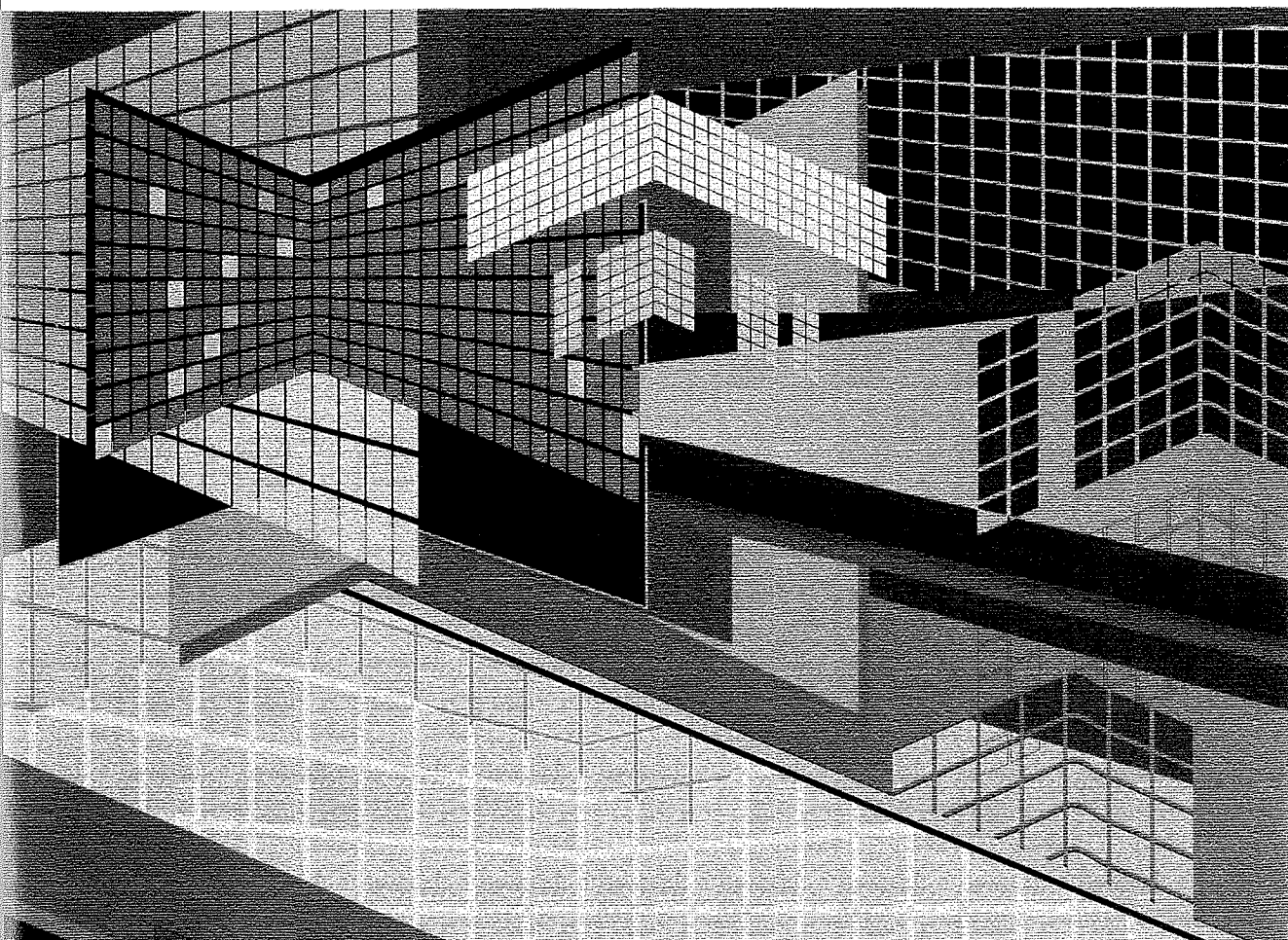


GLOBAL HOUSING MARKETS

Crises, Policies, and Institutions



Ashok Bardhan, Robert H. Edelstein, Cynthia A. Kroll, Editors

KOLB SERIES IN FINANCE

Essential Perspectives

CHAPTER 20

Taiwan: Housing Bubbles and Affordability

CHIN-OH CHANG

Distinguished Professor, Department of Land Economics, National Chengchi University, Taiwan

MING-CHI CHEN

Professor, Department of Finance, National Sun Yat-Sen University, Taiwan

This chapter begins with a general description of Taiwan's housing development and finance systems that influence the evolution of the housing market. Four periods of housing price jumps occurred in the past 40 years. We describe how these jumps occurred and how the government responded. We also show the sizes of housing bubbles in relation to housing prices, indicating a serious housing affordability problem in Taiwan. We present the current status of the housing market and discuss the major concerns for the current housing policy. We also present two important progresses in the Taiwan housing market: real estate securitization and reverse mortgage.

INTRODUCTION

Taiwan, officially named the "Republic of China," is an island located in the western Pacific Ocean, off the southeastern coast of mainland China. The area of Taiwan is only 36,000 square kilometers, but it has a population of approximately 23 million people (2010 figures). On average, there are 639 people per square kilometer and 3.3 people per household. Approximately two-thirds of the total area is unfavorable to land development due to site gradients. The island is roughly divided by the Central Mountain Range from north to south, with most settlements developed in the western Taiwanese plain. There are four major cities: Taipei, Taichung, Tainan, and Kaohsiung. Taipei is the capital and the largest city, with a population of 2.6 million. The second largest city is Kaohsiung, which has a population of 1.5 million. However, the population distribution is unbalanced in Taiwan. The Taipei metropolitan area (Taipei city and county) has a population of 6.5 million, accounting for almost one-third of the Taiwanese population.

During the past 40 years, the average annual population growth rate in Taiwan reached a peak of over 3 percent, but then declined to less than 1 percent after 1990.

Taiwan now has a 0.83 percent birth rate (2010), which is among the lowest rates in the world. On the other hand, life expectancy (for male) at birth in Taiwan increased from 62 in 1970 to 76 in 2009. The population aged over 65 made up 10.5 percent of the total population in 2009. Taiwan has begun to face severe population aging, as in other developed countries.

Taiwan's economy underwent a rapid transition and industrialization led by export growth during the post-war period. Economic growth recorded an impressive rate of increase, with an average of 9 percent per annum during the 1960s and 1970s. Although two oil crises and recessions occurred in the 1980s, Taiwan recovered faster than most other countries, with a peak economic growth rate of 12 percent in 1987. However, Taiwan's economy began to show signs of maturity, and economic growth began to slow down after the 1990s. Because of a conservative financial system, Taiwan suffered little compared with many of its neighbors in the 1997 Asian financial crisis. After 1997, economic growth rates fell below 6 percent. The global economic downturn, political turmoil, and an increasing amount of bad debt in the banking system pushed Taiwan into recession in 2001, the first full year of negative growth since 1947. Currently the electronics industry is the most important industry in helping to maintain Taiwan's economic growth. Exports, led by electronics and machinery, generate 70 percent of Taiwan's GDP growth and have provided the primary impetus for industrialization. This heavy dependence on exports made the economy vulnerable to the downturns in world demand resulting from the U.S. subprime crisis in 2007. However, Taiwan has shown signs of recovery, with an economic growth rate of 13.27 percent in the first quarter of 2010. Taiwan currently still runs a large trade surplus, and its foreign reserves are the world's fourth largest, behind China, Japan, and Russia. Recently, opened cross-strait travel, transportation, and tourism links are likely to increase Taiwan and China's economic interdependence.

HOUSING DEVELOPMENT, FINANCE, AND MORTGAGE

We briefly describe the development of the housing, finance system, housing finance system, and mortgage market as the background for understanding why housing price cycles have occurred for the past 40 years.

Housing Development

Investment in housing as a percentage of the gross domestic product has not been very stable, varying from 1.15 to 4.21 percent over the past 40 years. There is evidence of a significant decrease from the past decade, dropping below 2 percent since 1997. The housing stock closely matches the household number. The ratio of housing stock to household number is generally slightly higher than one, indicating no sign of a housing shortage. During the early years, new housing completions were occurring at around one hundred thousand units per year, whereas the ratio of completions to housing stock in Taiwan was approximately 2 to 3 percent. However, this ratio has dropped below 2 percent over the past 10 years, as in other developed countries where the population growth rates are decreasing.

In terms of housing space, the living standards have improved gradually over the past few years. The average floor area of a household increased from 106 square meters in 1987 to 142 square meters in 2008. According to the "2005 Report of Housing Status Survey," 32.10 percent of households were accommodated in apartments, 24.58 percent in town houses, 5.91 percent in duplexes, 18.86 percent in single-family houses, and 8.55 percent in farmhouses. This report also indicated that 31.44 percent of houses were built before 1980, 31.72 percent were built between 1970 and 1980, 29.42 percent were built between 1980 and 1990, and 7 percent were built after 1990.

The proportion of owner-occupied dwellings in Taiwan increased significantly from 66.3 percent in 1970 to 87.4 percent in 2008, corresponding with a decline in the number of privately rented properties. One important characteristic of Taiwan's housing market is its comparatively large number of owner-occupied dwellings and a relatively small rental sector. Exhibit 20.1 shows the Taiwan housing market development in recent years.

Financial System Development

Taiwan's financial institutions can be classified into two groups. One group is established under laws, whereas the other is not based on laws and involves underground financial institutions. Legal financial institutions include commercial banks, specialist banks, savings banks, and so forth. One commercial bank, Taiwan Land Bank, specializes in real estate and handles real estate loans pursuant to government policies to enhance national economic development. However, Taiwan Land Bank is still a full-scale financial institution, and all other financial institutions can provide loans for real estate. The principle government agency responsible for the supervision of financial institutions is the Central Bank, which is responsible for implementing monetary policies and handling a considerable amount of financial supervision.

The financial system in Taiwan transformed slowly, from a backward and controlled system to a modernized and liberalized system. Before 1975, the interest rate was wholly determined by the Central Banks. All of the banks were either entirely or partly owned by the government and had to accept the designated interest rate. In 1980, the "Essentials of Interest Rate Adjustment" was promulgated and implemented with the purpose of allowing banks more flexibility in determining interest rates during times of change in the money-market situation. A loan rate liberalization policy was further implemented in 1985, in which 10 leading banks were required to set their own prime rate according to their own position and the market position. This so-called "basic lending-rate system" was followed by other banks in September 1987.

Some other important financial changes also occurred in the late 1980s. Before 1987, Taiwan adopted a fixed exchange-rate regime. Because of its huge export surplus from the early 1980s, market forces exerted a strong upward pressure on the exchange rate. After the Central Bank adopted a managed floating exchange rate regime in 1987, the exchange rate began to rise rapidly, from NT\$36 = US\$1 to NT\$25 = US\$1 from 1987 to 1989. Furthermore, foreign exchange control was abolished in 1987. The restrictions on capital flows were lifted, enabling capital to move freely in the foreign exchange market, which resulted in higher speculative

Exhibit 20.1 The Taiwan Housing Market and Development

	2004	2005	2006	2007	2008
<i>Housing Demand and Supply</i>					
Households	7,179,943	7,292,879	7,394,758	7,512,449	7,655,772
Housing stock (dwelling-unit)	7,297,358	7,409,953	7,531,797	7,659,643	7,767,945
Housing supply ratio (%)	101.64	101.61	101.85	101.96	101.47
Housing surplus (dwelling-unit)	117,415	117,074	137,039	147,194	112,173
Number of units by building permit	110,981	121,622	116,165	106,197	70,318
Number of units by occupancy permit	96,614	114,904	123,853	130,515	111,057
<i>Housing Market</i>					
Transaction registered buildings	418,187	434,888	450,167	414,641	379,326
Auction registered buildings	54,717	33,295	25,467	25,596	24,954
Price-income ratio (house-owners)	6	6.9	6.6	7	7.1
Mortgage payment-to-income ratio (%)	27.1	28.4	30.9	30.8	29.6
Outstanding construction loan (million NTD)				694,838	708,350
Outstanding house loan (million NTD)				4,069,802	4,677,643
Loans (including NPL) (million NTD)				4,542,354	4,737,824
The amount of NPL (million NTD)				67,621	68,435
NPL ratio (%)				1.49	1.45
<i>Housing tenure</i>					
Ownership (%)	86.8	87.33	87.83	88.14	87.36
<i>Dwelling level (m²)</i>					
Average living space per household	140	139	131	143	143
Average person per household	3.5	3.42	3.41	3.38	3.35
Average living space per person	40.0	40.7	41.4	42.3	42.5

Source: Housing Statistics Annual Report (2007), Construction and Planning Agency, Ministry of the Interior.

movements during this period. All of these financial changes caused an imbalance in the macroeconomy in the late 1980s, which can be gauged from the increase in the money supply, which was as great as 50 percent per annum during the late 1980s. It seems that financial liberalization and loose monetary policy unleashed investment activity in both the stock and real-estate market, causing dramatic booms.

After 1990, Taiwan's bubble economy began to collapse. Economic growth tended to decline, and the trade surplus began to decrease. The new Taiwanese dollar also began to depreciate against the U.S. dollar. Missile tests and other military activities conducted by mainland China in 1997 and the Asian financial crisis in 1997 further caused capital outflow and NT dollar depreciation. The Central

Bank had to release U.S. dollars into the foreign exchange market to stabilize the fluctuations. On the other hand, as a step toward financial liberalization, the government lifted its ban on new establishments of commercial banks in 1991, creating a competitive situation in the banking sector.

Housing Finance Development

Whereas private housing accounts for most of the housing stock in Taiwan, Taiwan did not have mature housing finance until 1990. The financial system in Taiwan before the 1990s was criticized as being underdeveloped and inefficient. Due to the underdeveloped finance system of the early years, private developers usually obtained loans for land acquisitions with land as collateral because they had difficulty obtaining loans during the construction stage. Private developers had to devise various strategies, such as cooperative construction and pre-sales systems, to solve the problem of funding. These strategies were proven to be successful in the development of the Taiwanese housing system.

The pre-sales system, which was developed in the 1960s and is still very popular in the Taipei area, can be thought of as a kind of self-financing system for house-buyers and developers. Once a building permit is obtained, the developer can pre-sell the property before construction to real estate buyers who will then pay based on an agreed schedule according to the construction progress. From the speculative buyer's viewpoint, because only 5 percent of the housing price or even less is required in cash, the leverage is very high. There is also no transaction tax before the property is completed because the property has no record on the official property registrar. Pre-sale contracts have therefore served as popular investment vehicles.

Mortgage Market

Financial institutions are the main sources of construction and housing loans. Because of their conservative economics, Taiwan's financial institutions tend not to engage in risky construction and housing loans. The government is another source of housing loans, but only for public housing, which accounts for less than 5 percent of the total housing stock. In recent years, the government has tended to subsidize mortgage rates instead of providing housing loans.

Exhibit 20.2 illustrates the house-purchasing and construction loan trends for the past 20 years. Both loans show rapidly increasing trends. Construction loans show strong cyclical behaviors because of the boom-and-burst cycle in the housing markets. Following the authorization of 16 new banks in 1991, stiff competition has caused the banking industries in Taiwan to loosen their lending requirements. The growth of mortgage loans is largely driven by private banks. However, after the 1997 Asian financial crisis, the macroeconomy declined and the real estate market became sluggish, leading to increases in the non-performing loans ratio in Taiwan's banking industries. Housing, renovation, and construction loans were equal to about half of Taiwan's gross domestic product. Household mortgage loans accounted for 38.4 percent of the GDP, whereas the proportion of household total debt to the GDP was 54 percent, the highest in the Asian region.

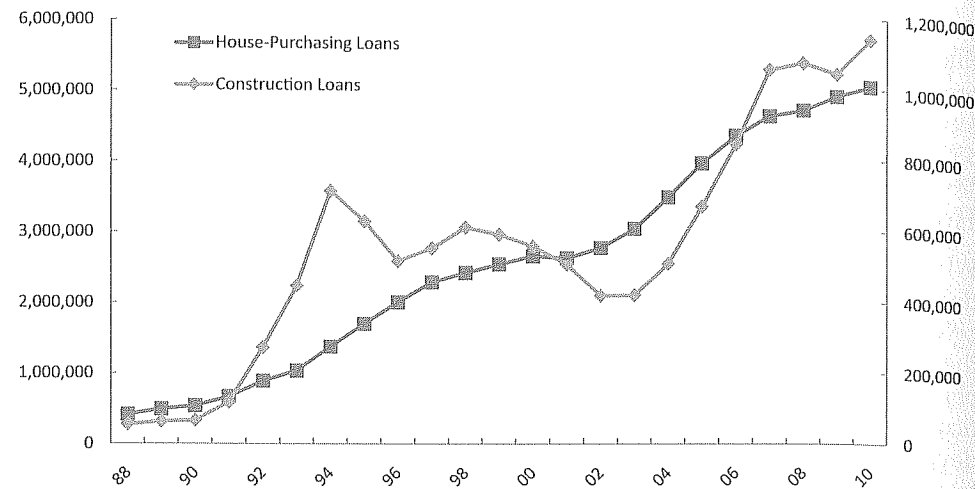


Exhibit 20.2 House-Purchasing and Construction Loans (million NTD)

Sources: Financial Statistics Monthly 2010; the Central Bank of China.

The debt burden of households is heavy in Taiwan, especially for the Taipei area. Mortgage payments for Taipei households may be up to 40 percent, whereas households in other cities have relatively lower percentages, around 30 percent. Owner-occupied residential loans usually have a term of 20 years, but favorable bank customers may obtain a loan of maturity for 30 years. The term of maturity is influenced by the borrowers' credit record or investment relationship with the bank and appears to be a measure of distinguished borrower segments rather than borrowers' self-selection behaviors, as in the U.S. market.

Mortgage contracts in Taiwan were mostly nominated adjustable rates, which are adjusted according to the basic rate of mortgage determined by the Central Bank. However, this basic rate is sticky so Taiwan mortgage contracts were fixed rates in nature before 2000. During the late 1990s, the market interest rates spiraled down, but the overall banking industries in Taiwan tended not to mark down mortgage rates to earn extra spread to cover their substantial mortgage losses. Therefore, the Central Bank improved the basic point mortgage and asked banks to make the mortgage rate more flexible in 2001. There have been many banks offering adjustable-rate mortgages since then. In term of the loan-to-value ratio (LTV), 70 percent is the average figure, whereas the max LTV was 80–90 percent. The LTV varied according to the market situation.

Government Housing Policy Using Mortgage

Starting in 1999, Taiwan's government introduced a series of policies to encourage households and housing developers to enter the housing market. The most important policy for promoting housing market growth is the mortgage-interest-rate subsidy to first-time home buyers. In 1999, the government provided a budget of 150 billion NTD (about 4.5 billion USD) to subsidize first-time home buyers with a lower mortgage interest rate. All qualified first-time home buyers were

allowed a mortgage of 2 to 2.5 million NTD with a subsidized interest rate about 0.25 percentage points lower than the market rate. These subsidies remained in place until 2008. The goal of the Taiwanese government's housing policies was to make owner-occupied housing more affordable by subsidizing the mortgage interest rate, increasing the maximum amount of mortgage loans eligible for subsidy, and relaxing the requirement that only lower-income households would be eligible for subsidies. These subsidies enhanced and strengthened the linkage between housing and credit markets.

The housing subsidy policy in Taiwan has for a long time overwhelmingly concentrated on promoting home ownership, but has done very little to subsidize renters, whose income is usually lower and who also need more subsidies than home-buyers. As a result, many studies have indicated the inequality of housing subsidies, which is a critical issue in Taiwan.

Housing Cycles and Policy against Bubbles

Taiwan has experienced high growth rates in housing prices over the past 40 years. Exhibit 20.3 shows Taipei's household disposal income and pre-sale housing prices in real term from 1973 to 2010. During this 38-year period, the nominal average annual price increase was 9.96 percent, but the real price increase was 5.53 percent. The standard deviation of average nominal housing prices was almost 25.34 percent over the sample period, indicating that housing prices were highly volatile and that there were periods of remarkable fluctuations in their rate of growth.

There were four cycle periods: 1972–1974, 1978–1980, 1987–1989, and 2004–2010. Nominal housing prices doubled during the first and second cycle,

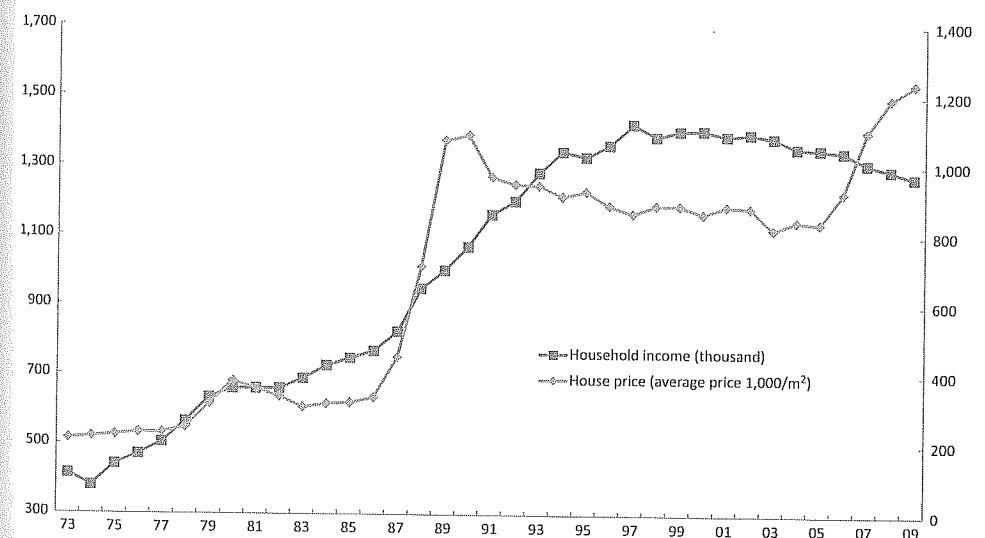


Exhibit 20.3 Taipei Household Incomes and Housing Prices from 1973 to 2010 (in Real Terms)

Sources: Household Income: Taipei City Statistical Abstract and Taipei Country Statistics; Housing Prices: Taiwan Real Estate Research Centre, National Chengchi University.

tripled in the third, and have almost doubled so far in the present cycle. The last year of the first cycle period was 1974, which was followed by three years of recession. During the second cycle, the real price increases were 27.5 percent and 20.3 percent in 1979 and 1980, respectively. Prices then declined by an average of 3.6 percent per annum over the next six years. In 1987, 1988, and 1989, real prices increased by 33.3 percent, 69.5 percent, and 43.2 percent, respectively. During the third cycle the rate of real price increase peaked in the third quarter of 1989 and then declined by 14.1 percent in 1991. The housing market went into a very long recession of about 13 years after the third boom and then began to rise again after 2004. Thus far (up to 2010), housing prices have increased by almost 70 percent in the city of Taipei.

In terms of periods of expansion and contraction, we can see that the first and second cycles had an approximately two-year expansion period and a seven-year contraction period. The third cycle had a three-year expansion period and a 13-year contraction period, and the recent cycle so far has had a five-year expansion period. One phenomenon found in the Taiwan housing market is that expansion periods are short, whereas contraction periods are long. This appears to be different from the housing markets in other developed countries, such as the United States, where there are long expansion and short contraction periods. If this phenomenon continues to persist, one might expect the Taiwanese housing market to go into a long recession period after this boom. Furthermore, when periods of expansion and contraction increase, it means that the degree of volatility is decreasing. This appears to suggest that the Taiwan housing market is becoming more stable, which has been observed in other developed countries.

The First Cycle (1972–1974)

The rise in housing prices in the early 1970s was commonly understood as caused by the oil embargo. Being a small open economy, Taiwan is rapidly affected by external shocks caused by changes in international prices and currencies. The effects of the oil embargo were worldwide and were especially severe in oil-importing countries. Because 75 percent of energy and all oil is imported, the housing market as well as the whole economy was seriously affected by this crisis. The sudden increase in oil prices led directly to high inflation in most commodities. The oil embargo caused inflation rates to jump around 80 percent from 1973 to 1974. It also led to a sharp rise in the cost of construction and the cost of capital on the supply side, and triggered the expectation of housing price increases.

Money supply is believed to be an important factor behind the housing price rise. Money supply increased rapidly in the early 1970s. Before the oil embargo, Taiwan had a few years of high economic growth, which maintained a high rate of around 12 to 13 percent from 1971 to 1973. The trade surplus caused foreign money expansion and also led to increases in the domestic money supply. In this period, lower interest rates further caused an expansion of domestic money supply of more than 30 percent and stimulated investment in the housing market.

Controlling inflation has always been a primary objective of Taiwan's macroeconomic policy. In order to stabilize the inflation caused by the oil embargo, the government proposed some programs. In 1973 and 1974, the government announced the "Economic Stabilization Program" in order to control the negative effect of inflation on economic growth. Programs relating to the housing market included

credit restrictions and termination of permits on vacant development land. Because some developers hold vacant land and delay the timing for development, this program forced them to release vacant land in the market in order to increase housing supply. Mortgage interest rates also rose from 11.3 percent in 1973 to 16.5 percent in 1974. These policies successfully stabilized the economy as well as housing prices.

The Second Cycle (1978–1980)

After four to five years of recession in the housing market, housing prices began to rise again in 1978. The factors that stimulated the increase in housing prices were similar to those that caused the first boom. Inflation caused by oil price increases again resulted in higher costs on the supply side and expectations of price increases on the demand side. Money supply was also considered as a secondary factor. The causes behind the money supply expansion were the low interest rates, high economic growth, and the trade surplus. These are also the same causes as the causes of the first boom.

Again to dampen the real estate boom, the government proposed programs similar to those in the first boom period, such as termination of construction permits, an increase in land value for tax base, and so forth. In addition, zoning was approved in the councils of the cities of Taipei and Kaohsiung, which caused developers to build more houses ahead of these changes. These measures again successfully brought the boom to a halt. Unfortunately, worldwide economic recession began after this boom and affected the Taiwanese economy. This economic slump affected the investment demand and also severely damaged the construction industry. About 13 percent of property developers declared bankruptcy by 1981.

The Third Cycle (1987–1989)

The main cause of housing price increases during this boom was the rapid expansion of the money supply. The inflation rate on the general price level was relatively stable and did not play a significant role in this boom compared with the previous booms. The primary reason behind the increase of the money supply was the consistently high economic growth rate of around 12 to 13 percent. First, credit restrictions were relaxed in 1987, causing the expansion of lending volume to the housing sector by banks. Second, a change in the foreign exchange rate regime and the liberalization of foreign exchange control (removal of foreign exchange limitations) induced speculative activity in the foreign exchange market, causing foreign money to flow into and out of domestic financial markets. Taiwan's currency finally appreciated by almost 40 percent, and this raised the level of domestic money supply. Foreign exchange reserves increased rapidly during 1985–1987 and clearly displayed a jump just before the third housing price boom. The increase in foreign exchange reserves reflects the rapid economic growth in Taiwan and appears to show a higher correlation with housing prices than the GNP. Third, expropriation for reserved land for public facilities caused large amounts of compulsory purchase cash to go into the investment market. The government reserved large amounts of land for public facilities, which were supposed to be mandatorily purchased within 15 years of 1973. However, because of budget shortages, the government had difficulty in purchasing during these years. The government finally prepared a budget in 1989 and gave a large amount of cash to the owners of reserved land. The

owners of reserved land invested this cash in the asset markets. In addition, due to the fewer investment assets in Taiwan, the expansion of money supply flowed into the stock market and the property market as a store of wealth and created this amazing boom in both markets. Real housing prices increased threefold and the stock price index dramatically rose from 2,000 to 12,000 points during this period.

The government again proposed programs such as raising interest rates and loan controls to reduce the money supply in 1989. The Central Bank adopted selected credit control measures, including stopping uncollateralized loans for land and restricting the amount of construction loans and LTV below 50 percent. This helped to push the economy into recession and weakened the housing market considerably. Despite success in smoothing out the housing price increases, housing prices increased three-fold, reaching a peak in 1989 and then settling down into a long quiet period until 2004.

The Fourth Cycle (2004–2010)

After 13 years of recession from 1990 to 2003 in the Taiwan housing market, housing prices began to rise again in 2004. However, the difference of this cycle from the previous cycles is that it occurred in the major metropolitan areas but was not widely spread out in Taiwan. The Taipei metropolitan area had a much higher housing price growth rate than the other cities. This phenomenon is fundamentally related to unbalanced resource distribution in Taiwanese regional development because Taipei is the political and economic center and has more job opportunities than other cities. Another difference is that this cycle has lasted much longer in terms of expansion and contraction as compared with the previous cycles. This cycle is basically fueled by low interest rates, which give business conglomerates and speculators leverage to play the market. This record-low interest-rate environment may prolong the bubble-to-burst cycle.

Other factors attributed to Taipei's rising housing prices may include the surging stock market, reduced estate and gift taxes, an easing of cross-Taiwan Strait regulations and a lack of confidence in derivatives or other sophisticated financial instruments. This long-lasting cycle may be partly driven by expectations of Chinese investments. In 2010, Memorandums of Understanding (MOUs) on financial supervisory cooperation signed by Taiwan and China and the Economic Cooperation Framework Agreement (ECFA) between the two countries widened market openings for Taiwan and China. These closer trade ties with China have increased investors' expectations.

In June 2010, the Central Bank raised the re-discount rate and secured the financing interest rate and short-term interest rate by 0.125 percent respectively. The Central Bank also adopted targeted credit tightening measures in specific areas (including the city of Taipei and 10 cities in Taipei County). Under these measures, if those who are already homeowners want to apply for mortgages for newly acquired residential properties in those specific areas, the mortgages are subject to the following three stipulations: (1) approved loans must not exceed 70 percent of the value of the collateral, (2) no grace periods can be allotted, and (3) no additional loans such as home renovation loans against the same collateral can be taken. Other anti-bubble measures taken by the government included increasing the supply of low-cost housing and discontinuing the sale of government-owned lands. The

Ministry of Finance is also contemplating the implementation of a progressive real-estate tax system.

Because of such measures, there were signs that housing prices would decline as transaction volume began to contract. However, none of these steps were found to be very effective in taming Taipei real-estate prices, and housing prices remained resilient. This is also probably due to historically low interest rates. In addition, at the same time, the government carried out a series of stimulus measures, such as extending the expiration of construction license permits and offering additional preferential mortgage loans for home buyers as well as opening local real estate to investors from China. Housing prices are still increasing.

An Estimation of Housing Bubbles

Chang, Chen, Teng, and Yang (2009) and Chang, Chen, and Yang (2010) quantitatively analyzed bubbles for the Taipei housing market. These two studies derived the market fundamental housing price as the sum of the expected present values of rent or permanent housing income. Then they used a state space model to estimate the exact bubble values. The underlying hypotheses are that deviations from the fundamental outcome are bubbles. The rent model assumes that the present value of rent is the fundamental value of housing. The income model assumes that the affordable values are the fundamental values of housing.

By using the housing prices in Taipei from the first quarter of 1973 to the first quarter of 2010, it can be seen that bubbles are statistically significant in Taipei for 1988 to 1990 and 2004 to 2010 for their models. Exhibit 20.4 shows the estimation of the housing bubbles. The bubble accounts for 57 percent of the housing price from the housing rent and income models. The bubble prices estimated by the two models for the present are close to 43 percent of the housing price.

A Survey of the 2010 Housing Market

Based on a 2010 housing demand survey conducted in five major urban areas by the Construction and Planning Agency, the Ministry of the Interior stated that new homeowners and first-time self-use buyers composed the largest portion

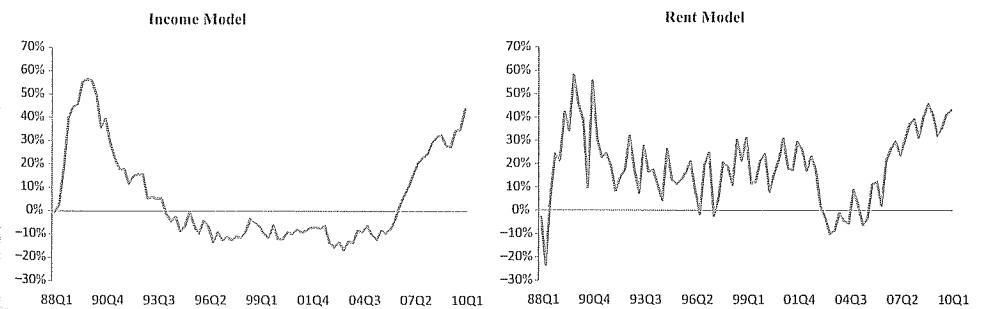


Exhibit 20.4 Percentage of Housing Bubble to Housing Price

Source: Chin-Oh Chang, Ming-Chi Chen, Chih-Yuan Yang (2010), "Re-examination of Taipei Housing Bubbles," Taiwan Real Estate Center, National Chengchi University.

(58 percent), and owners for investment purposes accounted for 17 percent. The Taipei County area has the largest portion of first-time self-use buyers, whereas Taipei City has a higher percentage of buyers for investment purposes; Kaohsiung has a higher percentage of buyers for replacement purposes. Among all purchases, secondhand houses/apartments accounted for the largest portion (62 percent), followed by newly built (31 percent), pre-sale (6 percent), and foreclosure properties (1 percent). Taichung has the highest pre-sale percentage as compared with the others, whereas Kaohsiung has the highest foreclosure percentage. The price is negotiable for up to 11 percent on average below listing price and Taipei has the largest price negotiation range (13 percent). The average searching period was six and one-half months, and the average number of houses viewed by the purchaser was 13. In these five major urban areas, the average housing price-to-income ratio (PIR) was 7.7 for homebuyers, and the monthly mortgage payment over income ratio was 31.6 percent. Taipei City has a higher PIR (10.9) and mortgage-payment-over-income ratio (43.0 percent), whereas Kaohsiung has a lower PIR (6.4) and mortgage-payment-over-income ratio (25.1 percent).

HOUSING AFFORDABILITY AND POLICY

Housing affordability problem is always a major concern for housing policy in Taiwan. Rapid economic growth in Taiwan has resulted in both income growth and monetary growth. The growth in income has increased residential demand for houses, and monetary growth has caused further investment demand for houses. These strong demands for houses have caused housing prices to rise quickly and have produced heavy housing cost burdens for households. This burden is especially heavy in the Taipei area, where strong investment demand for housing persists.

Housing Affordability

There are several possible underlying causes of Taiwan's affordability problem. First, its high population density is the fundamental cause, as is the case in other Asian cities. Second, the Chinese traditional preference to own property could be another reason. One characteristic of Taiwan's housing market is its comparatively large number of owner-occupied dwellings and a relatively small rental sector. Third, housing policy has been considered as a low priority in Taiwan's development agenda, with public housing comprising less than 5 percent of the total housing in the market. Fourth, financial liberalization and loose monetary policy might have caused the PIR to shift even higher. Domestic monetary growth has been considered as an important factor in explaining housing price fluctuations in Taiwan. In a rapidly growing economy, economic growth will certainly cause income and housing prices to rise. However, it is questionable that housing price will climb faster than income in the long run because houses will eventually become unaffordable.

Chen, Tsai, and Chang (2007) examined the relationship between housing prices and income in Taiwan over the past few decades. They found that the

PIR has varied from 5 to 13 because income shows a steady growth, but housing prices shoot up every other time. Their empirical analysis provides evidence of a long-term equilibrium between housing prices and income, although short-run deviations exist, explaining why the PIR ratio sometimes climbs up to 13. This study suggests that housing and income may not always correspond to each other but will return to an equilibrium level in the long run. This study also suggests that, due to inefficiency in the Taiwan housing market, the market may take quite a long time to recover. If the housing affordability problem becomes very serious, the government should act more quickly to intervene with policies to help the ratio recover sooner. In recent years, the housing bubble has widened the gap between the real estate haves and have-nots. Wealthy people with substantial capital can buy luxury condominium units, whereas workers with average salaries cannot buy even a regular apartment unit. However, Taiwan's government is still hesitating to dampen the real estate boom because of its low economic growth since the U.S. financial crisis.

Housing Policy

As a result of the increases in housing prices over the past five years, there have been considerable differences in housing prices in Taiwan's main metropolitan regions. Prices have risen most sharply in Taipei due to strong demand. The sharp increases in housing prices in the Taipei metropolitan area have created a heavy burden for low- and middle-income earners and salaried employees. This phenomenon is closely related to factors such as limited land supply, regional development, and the spatial distribution of industries. Because the real-estate sector is an important part of the overall economy, the Council for Economic Planning and Development (CEPD, Cabinet) has drawn up a proposal for a Plan to Enhance the Soundness of the Housing Market, with the aim of promoting socioeconomic stability and meeting the basic housing needs of low- and middle-income earners and the salaried class. This plan is based on the six core principles of (1) tailoring measures to the needs of localities and populations, (2) acting moderately but effectively, (3) stressing soundness and stability, (4) pursuing social equity, (5) maintaining information transparency, and (6) taking relevant complementary measures. It contains 21 working principles and 44 specific measures to address the six tasks of achieving a balance of housing supply and demand in the Taipei metropolitan region, helping low- and middle-income earners and salaried employees increase their ability to purchase or rent a home, improving housing information, enhancing risk management for real estate loans, enhancing social fairness, and taking relevant complementary measures.

In February 2011, the Finance Ministry proposed a luxury tax, which targets real-estate speculation and expensive goods and services. The plan calls for a luxury tax of 15 percent on properties sold within a year of purchase. Although this luxury tax will be not launched until mid-2011, it has already exerted a strong influence and is now cooling down the housing market. On the other hand, Central Bank is also trying to strengthen the central bank's audits to block speculative funds from flowing into the housing market.

FUTURE MARKET REVOLUTION IN TAIWAN

Two important policies came into effect recently for the long-term development of the housing market. The first concerns real-estate securitization, which helps to liquidate mortgages for financial institution and to provide an effective channel for real-estate developers. Real-estate securitization also helps to direct investment demand for real estate from the real-asset market to the financial-asset market. The policy of real-estate securitization aims to regulate the fluctuating real-estate market. Reverse mortgage is another important housing policy. The population in Taiwan is aging rapidly and reverse mortgage can solve the problems of senior citizens for both residential and living expense.

Real-Estate Securitization

Taiwanese real-estate finance has made substantial progress since 2000, when the secondary-mortgage market and real-estate securitization policies began to take effect. The Financial Asset Securitization Act was promulgated in 2002, and Taiwan's Real Estate Securitization Act was enacted in 2003. The Financial Asset Securitization Act allows Taiwan's financial institutions to create mortgage-backed securities (MBS). On the equity side, the Real Estate Securitization Act allows two types of real estate securitization structures to be created: Real Estate Investment Trusts (REITs) and Real Estate Asset Trusts (REATs).

The creation of mortgage-side securitization of real estate was intended to help Taiwanese financial institutions transform their mortgages into liquid and tradable capital market instruments to replenish their funds. Cash flows from mortgages should become the focus of the banking and securities industries for mortgage pricing in the secondary mortgage markets. However, the liquidity of mortgages is not a major concern for current Taiwanese financial institutions because credit has over-expanded. Thus far, there have been very few MBSs created in Taiwan.

Taiwan's REITs are basically similar to those of other countries but with some major differences. For example, Taiwanese REITs only allow the operation type of investment trust, not the corporation type. In addition, Taiwanese REITs do not allow investing in real-estate development activities. The first REIT, FuBon REIT number one, was listed on the exchange in 2005; thereafter, seven other REITs were listed consecutively, which increased market capitalization to US\$1,588 million by the first quarter of 2009. This activity is nonetheless small compared with other Asian countries. On the other hand, the REATs were established to first hold defined real estate for specific periods of time, and then to raise funds in exchange for the properties. Rental and other incomes generated from the properties are also distributed to investors during the holding periods.

Although real-estate securitization opens up new sources of capital through public market listing (providing a good channel for developers or real-estate owners to raise funds), the impact of securitization in the real-estate capital markets is not strong. This is because Taiwan only allows REITs/REATs to invest in the properties that have produced income, but not in real-estate developing projects. In addition, because the low property rental rates have caused very low yields of Taiwanese REITs/REATs compared with other countries, current Taiwanese REITs/REATs are not attractive investments.

Reverse Mortgages

The Taiwanese government plans to design a feasibility and implementation plan for a reverse mortgage program for senior citizens. The CEPD plans to introduce this program in 2011, with "house-rich, cash-poor" senior citizens being the main targets. Chang (2009) proposed three reverse mortgage models. The first reverse mortgage design allows a homeowner to defer his obligation to repay the loan until he dies or leaves or the home is sold. The second one is sale-and-leaseback, which requires that a homeowner sell his or her property. However, the original homeowner can pay a small rent to remain in the house. The third mode is a social-care scheme, in which a homeowner donates his property to social welfare organizations, or the home-owner's property is held in trust and a social-welfare organization is the beneficiary. The organizations must then take care of the homeowner until he or she dies.

Reverse mortgages, sale/leasebacks or social-care schemes are very useful for helping senior citizens who have low incomes but a house of their own to boost their disposable income. Reverse mortgages are simply loans made to a homeowner against the property's equity. The money can be released in one lump sum or in multiple payments and is repaid when the property is sold or refinanced by the borrower's heirs after he or she dies. The mortgage allows seniors, when needed, to use their own properties as guarantees to obtain funds for post-retirement expenses including medical care fees. The sale/leasebacks option would allow the elderly to sell their homes to insurance firms, which in turn offer the seniors annuities based on the value of their property, while still allowing them to reside in their own homes as tenants. The social-care scheme, which was developed by Chang (2009), combines social care and donations or a trust system. Social-welfare organizations will take care of the elderly and keep their property in either a donation or trust system.

Taiwan has a rapidly aging population. At the end of 2009, the number of people who were 65 years and older reached 10.5 percent of the overall population, and this figure may rise to 14.7 percent in the next 10 years, according to estimations by the CEPD. Mortgages allow homeowners, usually retirees, to borrow money in the form of annual payments that are charged against the equity of their property. By offering a reverse-mortgage system, the Taiwanese government provides an opportunity to help property owners aged 65 and above in difficult financial situations to enjoy a higher standard of living.

However, reverse mortgages may cause the next subprime crisis. Some of the same U.S. lenders that helped drive the real estate boom with loans to home buyers who could not afford the payments are now targeting seniors. Taiwan should treat schemes that help the elderly live off the equity built up in their homes as commercial products rather than social-welfare benefits to ensure that the system can be sustained. The policy could be cost-free for the government except that it would be obliged to take over a property when most of its value has been converted into payments to the borrower, who will continue to receive subsidies from the government for as long as the borrower lives.

This extra cost, however, should not be seen as a burden since it has long been one of the government's responsibilities to look after the nation's financially marginalized groups, especially elderly citizens who may be homeless and

penniless. It is never too early for the government to begin with the creation of a social welfare safety net for Taiwan's growing population of seniors. Another question that needs to be addressed is whether the government should invite the private insurance or banking sectors to participate in the system. The answer in the foreseeable future may not be possible since private companies generally seek a profitable business model when deciding whether to enter a potential market.

The great incentive behind the growing popularity of reverse mortgages, at least in the United States, is that if a borrower outlives the loan's term, he or she can continue to stay in the property while being entitled to government subsidies. However, when a borrower sells his or her home, he or she can use part of the proceeds to repay the lender's loan plus interest and other fees, whereas the remaining equity in the property still belongs to the borrower or his or her estate. This is a losing deal for private companies.

Additionally, the U.S. experience shows that more than 90 percent of reverse mortgage borrowers prefer a safe plan, such as that provided by the federal-government-insured U.S. Home Equity Conversion Mortgage program. Therefore, it is generally agreed upon that full government support will be key to the success of this initiative in Taiwan.

CONCLUSION

The Taiwan housing market has been quite volatile with four booms having occurred over the past 40 years. Measures by the government have successfully dampened price increases during the first three booms. However, housing prices have continued to rise during the current boom since 2004. The U.S. financial crisis occurred in 2007 and hit Taiwan's economy resulting in low and negative economic growth in 2008 and 2009. However, the Taiwan housing market appears to be intact and housing prices continue to climb. The government, so far, has not used strong policy measures to dampen housing price increases. Economic growth slowdowns over the past 20 years and the U.S. financial crisis have caused the government to hesitate using strong measures during the current housing market boom. Historically low interest rates might have sustained housing prices, preventing them from bursting. As the price-to-income ratio increased to a new high in the Taipei area, the government needed to take effective action to reduce the housing burden. For a long time, the Taiwan housing market has come under pressure from demographic influence, scarcity of land, and fast economic growth. However, a low birth rate and the slow economic growth over recent years should lead the housing market toward different developments. For the future housing market, the government should establish housing policy from a new line of thinking.

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ABOUT THE AUTHORS

DR. CHIN-OH CHANG is Distinguished Professor in the Department of Land Economics and the Director of Taiwan Real Estate Research Center, National Chengchi University, Taipei, Taiwan. He received his Architecture Master's degree at MIT (Massachusetts Institute of Technology) in 1980, and a City and Regional Planning PhD degree at the University of Pennsylvania in 1986. He was President of the Asian Real Estate Society (AsRES) in 1997-1998, and the President of Global Chinese Real Estate Congress (GCREC) in 2009-2010. His research is published in *Urban Studies*, *Housing Studies*, *Journal of Property Research*, *Habitat International*, *International Real Estate Review*, and several other journals. He has concentrated his research in areas related to housing and land policy, real-estate investment, and financial analysis.

DR. MING-CHI CHEN is a Professor of Finance at National Sun Yat-sen University in Taiwan. He received his MS degree in Business Administration from Pennsylvania State University in 1993 and his PhD degree in Land Economy from the University of Cambridge in 1999. His primary research interest is in real-estate finance, economics, and investment; applied econometrics; and project financing. He has published in many international journals such as the *Journal of Risk and Insurance*, *Journal of Real Estate Finance and Economics*, *Journal of Housing Economics*, *Journal of Real Estate Portfolio Management*, *Journal of Property Investment and Finance*, and so forth. He currently serves as an editor of *Journal of Housing Study* (Taiwan).