



## Workshop

### “Monetary Policy and Inflation Targeting”

### “Inflation Control and Economic Instability”

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*Inflation Control and Economic Instability*

By Hassouna Moussa

Acadia University, Canada

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The famous monetarist A. Schwarz blamed A. Greenspan, the former chairman of the Federal Reserve Board (Fed) of the US, for keeping the interest rates too low for too long thereby precipitating the current subprime prime financial crisis in the US, (Schwartz, 2008). The latter responded that he was praised earlier for things he did not do and now he is blamed for things he did not do.

A monetary policy of inflation control needs to use interest rates to control inflation and the control mechanism is not precise and error proof. Indeed, there are more ways than one to interpret the actions of the Fed or any other monetary authority. One interpretation of the Fed's actions during the last seven years is that it kept the interest rates low too long in order to prevent a deflation in the US economy, a persistent threat to the US economy that was hard to shake off. That is, the Fed was mainly concerned about maintaining price stability and the goal of its monetary policy was to control inflation although it does not seek formally to target any particular inflation rate. The second interpretation is that the Fed has a dual goal of maintaining full employment and price stability in accordance with its legal statute. That is, the Fed wanted to keep the US economy from falling deeper into a recession. However, recessions are associated with deflation. Thus, under either interpretation, inflation control is a distinctive characteristic of the Fed's monetary policy.

Unfortunately, while the Fed was busy trying to prevent the US economy from sliding into a deflation, the subprime market came into full bloom and collapsed right at the time when the Fed changed its chairperson and shifted gears to move in the opposite direction, citing the threat of a rising inflation rate. The current financial crisis ensued and led to economic instability in the US and in the rest of the world albeit to a lesser degree. Now, there is simply too much coincidence for a prominent monetarist to resist accusing of mismanagement a monetary authority known for its heavy handed discretionary monetary policy. Since interest rates are the main mechanism of inflation control, blaming the former chairman of the Fed is thus an indictment of a monetary policy of inflation control.

Using three case studies of monetary policy in Japan, the US and Canada, this paper attempts to show that it is not a monetary policy of inflation control that we should blame, it is rather a failure of the regulatory system that is responsible for the current economic crisis in the US and the missed decade in Japan. A consistent timely and scrupulous application of an appropriate regulatory system to the entire financial system in Canada helped the Canadian economy to escape at least for the time being the crises that befell the US and the Japanese economies. This paper is organized as follows. The first section deals with the Japanese financial crisis in the nineties. The second section deals with the current subprime financial crisis in the US. The third section deals with the Canadian experience. The last section draws the lessons learned from comparing the Japanese, the US and the Canadian experiences.

## **Monetary Policy and Financial Crisis in Japan**

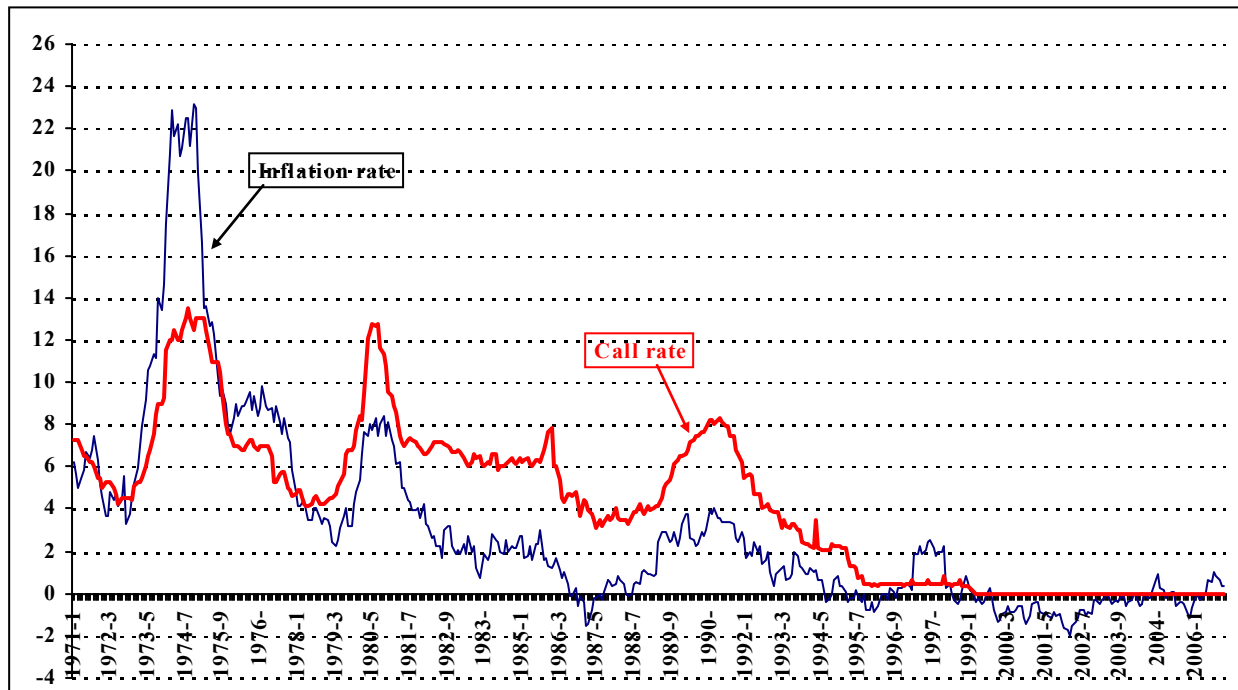
The record of the inflation rate in Japan since 1970, measured by the consumer price index, suggests that the central of Japan (BOJ) has been practicing implicitly an anti-inflation policy for at least the last thirty years. Figure 1 shows that, except for the oil shocks of 1973 and 1979, the inflation rate never exceeded 5%. Although the inflation rate increased during the worldwide expansion at the end of the 1980's it was never higher than 4%. Part (one percentage point) of the increase was due to the imposition at the end of 1989 of a 5% consumption (sales) tax.

### ***Nature of BOJ's monetary policy***

According to the OECD economic survey of Japan (OECD, 1988), the central bank of Japan was concerned about inflation and it was also concerned about the appreciation of the yen after the G5

meeting in September 1985. The continuous appreciation of the yen since 1985 and trade liberalization produced negative inflation rates of the prices of certain products that directly compete with imports. The lower prices of these products helped to partially quell the inflationary pressures on the CPI that were fuelled by a relatively rapid rise of the prices of services, especially rent. These pressures continued unrestrained until BOJ started to raise quickly its discount rate in a series of steps from 2.5% to 6% at the end of 1990. The inflation rate stopped rising at the end of 1990 and started falling.

**Figure 1** *Inflation rate and call rate in Japan*



According to OECD economic surveys, one of the reasons for changes in BOJ's discount rate in either direction is price stability. Although, it was not officially announced, the goal of the monetary policy of the bank of Japan has been to maintain price stability or a low inflation rate. The behaviour of the call money market rate in Japan between 1971 and 1996 supports this conclusion. The call rate is the interest rate determined in the inter-bank loans market that the bank of Japan used to conduct its monetary policy. Figure 1 shows clearly the close correlation between the call rate and the inflation rate until 1996. Indeed, according to Okina, Shirakawa, and Shiratsuka, (2001), "the basic objective of the central bank [BOJ is] to achieve price stability."<sup>1</sup>

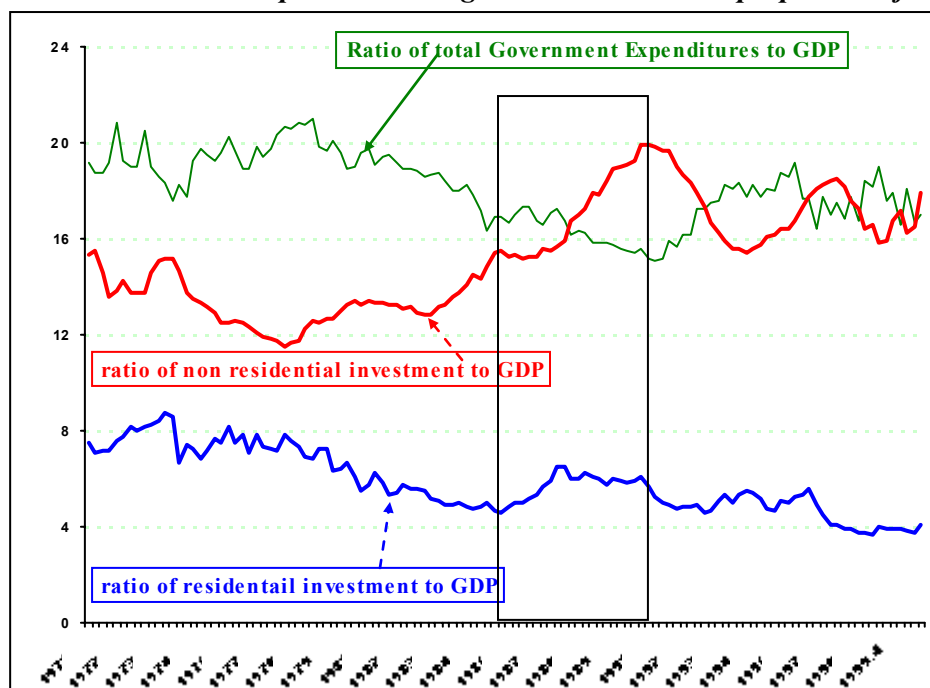
### ***The 1985 Plaza Accord Consequences for Monetary Policy***

Since inflation control was not an official goal, the Japanese government could from time to time assign to BOJ other temporary goals for its monetary policy. Under pressure from the US government and the governments of other advanced European countries, the Japanese government committed itself under the 1985 Plaza Accord to stimulate domestic aggregate demand, encourage imports from

<sup>1</sup> The quote is from page 421. At the time of writing their paper, the authors were economists in the Bank of Japan. The paper contains a footnote that states, the opinions of the authors do not reflect necessarily the official opinion of BOJ.

other countries, allow Japanese companies to borrow and lend on international financial markets and implement a policy of export restraints. The burden of stimulating domestic aggregate demand fell on monetary policy. As figure 2 shows, non residential investment as a share of GDP increased from 15% in 1985 to 20% in 1990 corresponding to the fall of the call rate from 6% in 1984 to less than 3% in 1989.

**Figure 2** *Government expenditures on goods and services in proportion of GDP, Japan*



Source: <http://www.esri.cao.go.jp/en/sna/qe011-68/gdemenu68.html>

Figure 2 shows also that the ratio of non-residential investment to real GDP increased from 4.7% in 1985 to 6.5 % in 1988 when it reached a peak and started falling. Accordingly, the Japanese economy maintained the growth rate of real GDP between 4 and 6% between 1986 and 1990.<sup>2</sup> In contrast, figure 2 shows that total government expenditures on goods and services did not change much relative to GDP, showing clearly that the government did not use fiscal policy to stimulate aggregate demand. Monetary policy had to bear the whole burden of compliance with the government's commitments under the 1985 Plaza agreement. BOJ had to change temporarily the goal of its monetary policy from inflation control to trade surplus control and the promotion of imports through a higher exchange rate and stimulation of domestic aggregate demand, regardless of whether the Japanese economy needed the stimulus or not.

### ***Consequences of the 1985 Plaza Accord and Financial Deregulation for the financial and non financial sectors***

In the beginning of the 1980's, the modus operandi of the Japanese financial and non financial systems started to change drastically. Acting on the US request and advice, the Japanese government implemented reluctantly several reforms designed to deregulate progressively the financial sector, free up domestic capital flows and international capital flows between Japan and the rest of the world,

<sup>2</sup> See Okina & al. Figure 1 p. 398

and encourage imports and restrain exports. Competition in domestic products and financial markets increased dramatically.

Starting in the early eighties, there has been a sea change in the institutional and regulatory framework of the financial system. The government of Japan started a slow deregulation process of banks, interest rates and credit in 1979 and completed it in 1991. By July 1991, the government abolished direct control of credit extended by financial institutions to the rest of the economy, removed existing barriers among various sectors of the industry and opened it up to foreign competition. Starting in 1980, large Japanese companies could issue bonds on international financial markets and borrow overseas. Furthermore, the government started to enforce one of the core principles of the Basle Committee on Banking Supervision that banks must maintain a ratio of capital to the total (risk adjusted) value of assets no lower than 8%.

Before 1985, BOJ and the Ministry of Finance (MOF) exercised a complete quantitative control on credit and interest rates despite the fact that most banks were privately owned banks (except for two large government owned long-term credit banks). The government (including the central bank, the ministry of finance, and the ministry for international trade and industry) used administrative guidance to limit competition in key industrial, commercial and financial sectors. Furthermore, banks did not have to maintain any sort of ratio between capital and the total risk adjusted value of their assets.

Although BOJ and MOF maintained control over interest rates paid on small deposits, starting in 1985 banks can fix freely interest rates on large certificates of deposits. This happened after banks complained to MOF about the higher interest rates paid by the Ministry of Post and Telecommunication (MOPT) on postal savings. Practically, the Postal Office Savings is the largest bank in Japan and this bank is not under the tutelage of MOF or BOJ. The interest rates paid on postal savings have never been subject to the maximum interest rate paid on bank deposits. MOF and MOPT reached in 1981, the compromise that banks and the postal savings may offer large money market certificates (larger than US\$ 30 000 at ¥100 a dollar) with a common interest rate that allows for a certain spread above the interest rate paid on the banks large deposit certificates. The postal savings maintained their independence in fixing interest rate on their small deposits, (McCall-Rosenbluth, 1999). Thus, banks now have to compete for large deposits of large companies and businesses increasing their costs of raising funds.

In 1979, regional banks, which are relatively smaller banks, enjoyed up to a 3% interest rate margin between deposits and loan rates. Large city banks enjoyed a 2% to 3% interest rate margin. By 1990, the interest rate margin dropped to 2.5% for the regional banks and 1.6% for city banks. Japanese banks that went eventually bankrupt in the late nineteen eighties offered after the onset of the 1990 crisis interest rates on term deposits that were up to one percentage point higher than the interest rates charged by sound banks for terms that were up to two months shorter. The unsound banks were competing fiercely for funds to cover their non-performing loans and to meet cash withdrawals by depositors. This kind of competition was not possible before 1985 and it squeezed banks profits.

Nakaso (2001) provides evidence that shows the average interest rate on term deposits exceeded the average interest rate on loans of all banks from 1985 to the end of 1990. This was incentive enough for non-financial businesses to issue commercial paper and use the proceeds to buy large certificates of deposits and pocket the difference, (OECD, 1988 ). The low interest rates on loans were possible thanks to competition and to the decision of the bank of Japan not to raise the call rate during the late 1980's for fear of causing a greater appreciation of the Japanese yen, which appreciated substantially immediately after the 1985 Plaza Accord. Thus, it is not surprising that the rate of return on banks assets fell from 6% in 1985 to 0 in 1993.

Due to the deregulation of the financial sector and the lower interest rate environment, competition among financial and non financial institutions greatly intensified. The loss of their stranglehold on large non financial enterprises forced large city and long term credit banks to compete fiercely among themselves and with other non bank financial institutions. The lower discount rate of BOJ encouraged the aggressive lending by financial institutions and abated competition. Financial and non financial institutions become more aggressive in their lending creating pressures on their profit margins.

On the other hand, the encouragement of imports and the self restraint on exports increased competition in the domestic product market adding to the pressure on the profits of domestic producers. The appreciation of the yen made foreign competition in the markets of non-financial non-agricultural products even fiercer in view of the appearance of the newly industrialized countries as direct competitors to Japanese producers both inside and outside Japan. The Japanese domestic markets are not any more the *chasse gardée* of Japanese producers or financial institutions. Large Japanese companies can now locate their plants outside of Japan to take advantage of cheap skilled labour and export back to Japan. In some cases, Japanese producers had to build production facilities outside of Japan to be able to continue to sell some of their products in certain other countries.

Stiffer competition in the domestic product markets led to a fall in the price index of unregulated products from 105 in the first quarter of 1985 to 80 at the end of 1986 following a similar drop in the index of imported prices. The situation became worse since the prices of regulated products remained essentially unchanged over the same period. Continuous fierce competition from cheaper imports caused a deflation in the product market and the CPI inflation rate dropped from 0% in 1985 to -6% in 1986.

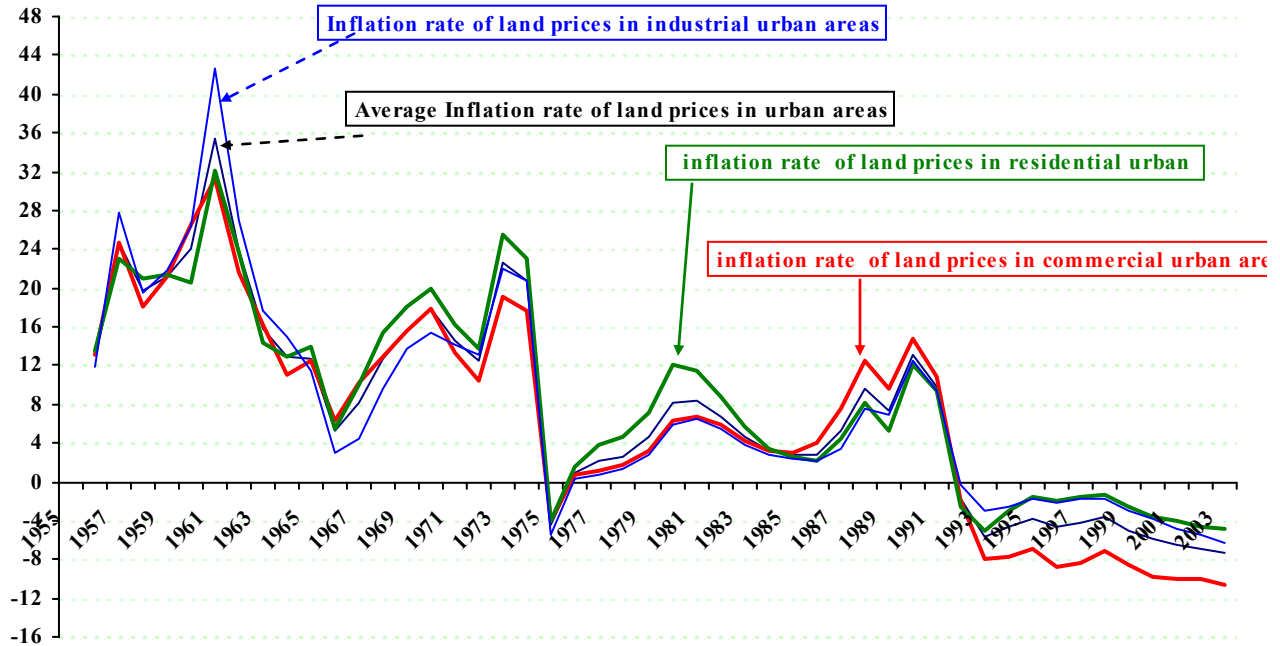
The significant increase in competitive pressures on domestic producers squeezed their profits rates, straining their ability to service their debts to banks and adding more downward pressures on banks' profits. Financial and non-financial institutions needed to shore up their lagging profits. Aggressive lending and borrowing plus investment in real estate seemed to be the solution, as it has been before. As was the tradition, real estate served as collateral and land price inflation offered a source of quick profits. There was a conviction that land prices never fall. Higher real estate prices would provide for enough income to pay for higher interest rates and profits.

In search for better returns on their loans, many banks made dubious loans to real estate developers and other financial and non-financial institution, especially after the Japanese government committed itself in its famous Structural Impediments Initiative Agreement (SII) with the US government to encourage domestic consumption. Loans made directly or indirectly through finance companies to the real estate sector represented respectively 9.9% of total loans in 1980 and 25.7% in 1990, (OECD, 1989) and most bank loans had real estate collateral, Nakaso (2001). Furthermore, the credit granted by all Japanese banks represented 118 % of GDP in 1990 up from 85% in 1980, Nakaso (2001). In the logic of the banks and financial companies that made the dubious loans, higher real estate prices would pay for higher interest rates and BOJ implicitly insures the risk of non-performance of such loans since it always bail out failing banks. Accordingly, it is not surprising that by 1999, the non-performing loans made by banks represented 7.8% of GNP. Indeed, the amount of non-performing loans of all Japanese banks increased from ¥ trillion 13 (approximately US\$ billion 100) in 1992 to ¥ trillion 30 (approximately US\$ billion 230) in 2000, Nakaso (2001).

### *Land prices*

Figure 3 shows that the increase in the inflation rate of land prices during the period 1987 to 1991 was not particularly impressive by the standards of previous economic expansions. It pales in comparison to the average inflation rate of land prices in the late fifties early sixties expansion period.

**Figure 3 Inflation rate of urban land prices, Japan**



True, in certain urban areas, real estate prices quadrupled between 1985 and 1990, Nakaso (2001). However, the average inflation rate of urban land prices hardly exceeded 12% in the late eighties expansion period. Furthermore, Figure 3 shows that there is a difference between the land price inflation in the late nineteen eighties and the land price inflation previous inflations. In certain urban areas, after the burst of the bubble, real estate prices plunged by 80% to pre-bubble levels, Nakaso (2001). In 1993, one year after the start of the deflation, the inflation rate of urban land prices, especially commercial land, became significantly negative and continued to be so until 2003.<sup>3</sup>

***BOJ under stress***

Long before the 1990 land and asset price bubble became entrenched, many observers have urged BOJ to raise its discount rate. However, BOJ could not do it, although it itself warned about the rising inflation rate. Due to the continuous appreciation of the yen and the Japanese government commitments under the 1985 Plaza accord, BOJ found itself between a hammer and a hard rock. It was confused about the proper course of action it should take. The consumer price index inflation rate was -6% in 1986 but increased to 0% in 1987 and eventually to 3% in 1990. The credit GDP ratio increased from 120% of GDP to 255% in 1990. The October 1987 worldwide stock market crash required the injection of extra liquidity in the money market. BOJ's frustration was manifestly clear

<sup>3</sup> According to OECD economic surveys, non real estate businesses and real estate developers invested in land during the late eighties expansion because capital gains are not taxed until they are realized. A collapse in land prices would hurt their balance sheet. It would reduce the collateral value of the loans they obtained from their main bank. During a recession, these businesses would be hard pressed for cash to service their bank debts. The loans granted by banks to those businesses would become non-performing and the banks balance sheets and profits would suffer.

in 1989 when it issued a severe window guidance to banks to slow down the growth rate of their credit but maintained the discount rate at its lowest level. The recovery of the US economy from the 1982 recession, that of the Japanese economy from the 1985 recession and the rest of the developed economies at the end of the nineteen eighties allowed BOJ finally to raise its discount rate from 2.5% in May 1989 to 6% in August 1990. The trouble was the extraordinary fast pace of the increase, probably to cool off the growth of credit and the land prices. In the same vein, the Ministry of Finance instructed banks to stop making additional loans including real estate related loans.

The sudden and steep increase in the discount rate and the curtailment of credit growth caused a sharp reduction of the liquidity of the monetary market and forced many of the non-financial businesses to sell land beginning in the early nineteen nineties. The price of land stopped rising, a fact that validated the persistent negative inflation rates of urban land prices and contributed to the observed deterioration of the balance sheets of many banks. The liquidity positions of financial and non financial businesses deteriorated, starting a scramble for liquidity and the building up of capital by the financial institutions to meet the Basle Financial Committee requirement of an 8% ratio between capital the total risk adjusted value of assets. The scramble burst the land prices bubble and precipitated the nineteen nineties financial crisis.

An interesting question remains, however. Why was the late eighties inflation of urban land prices accompanied by a financial crisis but not the previous inflations? The answer seems obvious. This time around, there were significant changes in the economic environment and the regulatory framework but serious deficiencies crippled the Japanese financial system.

### ***Serious Deficiencies***

Three characteristics of the Japanese banking system before 2000 made the Japanese financial system vulnerable to significant adverse changes in economic policy. They are the lack of a serious deposit insurance system, lack of serious independent supervision and lack of transparency.

#### *Lack of serious Deposit insurance*

Before, 1999, there was no serious deposit insurance. BOJ was responsible for the well-being of all banks and the banks were supposed to be responsible for supporting each other. It was understood that as a lender of last resort BOJ was responsible for bailing out the depositors of failed banks and MOF was responsible for working out rescue arrangements ranging from financial support provided by all other banks in the system to mergers of convenience between the failed bank and one or more other suitably chosen banks. This was a time honoured practice dating back to the beginning of the twentieth century.

#### *Lack of serious independent supervision*

Clearly, the collapse of inflation rates of land prices before 1985 needed not cause panic sales and it did not degenerate into significantly negative inflation rates of land prices. Furthermore, banks did not have to compete by offering higher interest rates on deposits in order to retain existing or attract new depositors. More to the point, BOJ used to give them loans that allowed banks to make more loans than their capital and deposits would warrant. Therefore, a liquidity crisis could never occur before 1985 and there was no independent supervision nor was there a need for it since BOG and MOF controlled and directed the flow of credit directly and indirectly. After the freeing up of capital flows, large Japanese banks expanded abroad to recycle the ever increasing trade surplus of Japan and shore up their flagging profits at home, free from any serious supervision and confident of the backing of BOJ. There was a conviction in Japan that the main reason that the Bank of International Settlements (BIS) introduced the core principles of the Basle Committee on Banking Supervision was

to slow down the expansion of Japanese banks abroad, which were free from any serious supervision at home unlike banks in other developed countries,

The supervision of financial institution with the exception of the postal savings has long been the responsibility of the Ministry of Finance. The postal savings, the largest bank in Japan until 1990, were under the supervision of the Ministry of Communications. Before 2002, MOF's supervision was limited since the BOJ and the Japanese government had implicitly assumed the ultimate responsibility of dealing with failed banks. They were responsible for reimbursing depositors, organizing and implementing rescue operations, reorganizing failed banks, and increasing the capital of failed banks. To discharge their responsibilities, they enlisted other banks and the taxpayer to provide financial assistance and they arranged for merger with other banks and/or for nationalization of failed banks.

Nakaso (2001) acknowledges that the Ministry of Finance and the Bank of Japan did nothing to force banks to deal promptly with inadequate provisioning of non-performing loans. The law left the decision of provisioning entirely to the discretion of bank managers. Furthermore, the Ministry of Finance imposed tight conditions for allowing tax deduction for provisioning non-performing loans. Therefore, financial statements of banks utterly underestimated the risk of non-performing loans. When a serious supervision law was enacted in 1998 to allow for adequate provisioning, the financial situation of many banks has become disastrous and they had to make huge provisions against much thinner profits and/or losses.

#### *Lack of transparency of financial institutions and non financial institutions*

Before 1992 there was no obligation for banks to disclose their non-performing loans. Since BOJ and MOF exercised detailed quantitative controls, banks could not grant risky loans nor did they have to borrow from the call loan market at higher interest rates to cover non-performing loans, loans that did not exist on their books. Every time a borrower falls behind in servicing her/his loans, the lender bank would grant a new loan and/or lower the interest rate on the nonperforming loan. Hence, the practice of not reporting non performing loans and not adjusting the balance sheet accordingly continued until 1999.

After 1992, the Ministry of Finance introduced an inadequate disclosure requirement that did little to remedy the situation. It was only in 1999 that the government enacted a new banking law, which specified a clear and extensive public disclosure procedure of non-performing loans, Nakaso (2001). Until then, transparency was lacking and the financial statements of banks did not reflect accurately their financial position. The ratio of capital to risk adjusted assets based on the official financial statements of banks was higher than 8%. However, banks could not augment their capital by issuing shares simply because the public has grown suspicious that the actual ratio is much lower. The actual ratio was lower, indicating clearly a serious lack of transparency, Nakaso (2001).

While the lack of serious deposit insurance, the lack of serious independent supervision and the lack of transparency were acceptable under quantitative credit control, they became fatal after the liberalization of credit, interest rates and capital flows starting in 1980.

#### *Monetary policy and economic instability in Japan*

Was the monetary policy of inflation control of the Bank of Japan responsible for the economic instability in Japan during the nineteen nineties? The answer is no. However, the clumsy application of the policy did contribute to the economic ills that befell Japan since 1990.

The monetary policy of inflation control that BOJ followed implicitly did help to stabilize the Japanese economy in the absence of political interference. The Bank of Japan intervened as a lender of last resort to save the Japanese payment system from total collapse and the Japanese economy from a serious deflation on several occasions. It intervened correctly when certain banks and other financial institutions went bankrupt during the nineteen nineties and it provided this assistance without stoking inflationary pressures. The bank has achieved this feat with the help of reorganization by the government of the deposit insurance system. The reorganization made it possible for the new deposit insurance corporation to obtain from the Bank of Japan short-term loans not exceeding one year of maturity. The loans served as a financing bridge. The Deposit insurance corporation was obliged to refund them from the proceeds of public auctions to the private sector of government bonds. Eventually, the corporation would purchase those bonds out of its future premiums and destroy them. In this way, the Bank of Japan provided to the Deposit insurance corporation the equivalent of approximately US\$ 75 billion in loans by the end of 1998. By March 2000, the amount of those loans that remained outstanding dropped to US\$ 2.3 billion without changing the inflation landscape or causing a deterioration of economic activity, a clear success of a monetary policy of inflation control.

In contrast, the Bank of Japan did not adhere to the requirements of inflation control during the period 1985-1990. To comply with the Plaza accord and the SII, it reduced its discount rate to 2.5% starting in 1986 and maintained it there until the beginning of 1989. It caused the call rate to fall to 3.75% in the middle of 1987 and maintained it below 4% until the beginning of 1989. It allowed banks to continue to increase their total credit to reach 118% of GNP in 1990 while admitting real estate collateral despite the fact that the Japanese economy was overheating.

The departure from a monetary policy of inflation control was the direct result of adding an additional target for monetary policy, an undisclosed exchange rate target, which prevented the Bank of Japan from raising the call rate on time. It has failed to inform the public or the regulators about the precarious financial situation of many Japanese banks who turned out to be in dire straits after the collapse of the stock market at the end of 1990 and the collapse of land prices after 1991. Beyond this error, the monetary policy of the Bank of Japan contributed little to the 1990's financial crisis. As the facts presented above suggest, the lack of appropriate regulatory institutions for the financial system, the lack of transparency, the weak implementation of the antimonopoly law, the sudden change in trade policy and the incomplete liberalization of prices are most likely responsible for the protracted economic slowdown and the wave of bankruptcies among banks and other financial institutions.

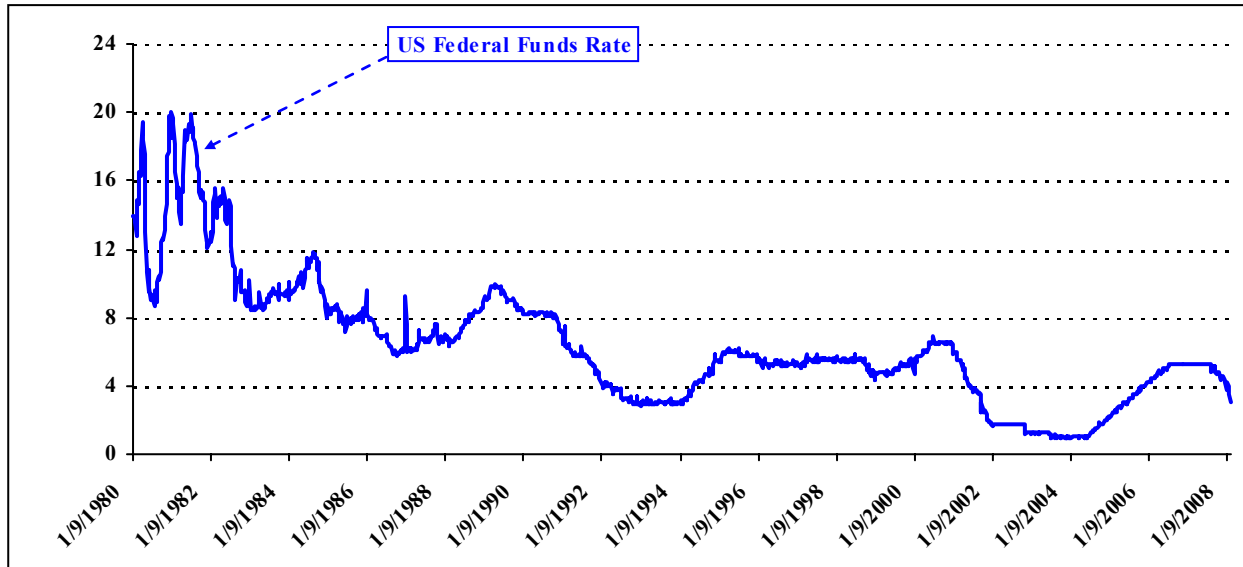
### **US monetary policy and the sub-prime financial and economic crisis**

The US monetary policy is not a self-proclaimed inflation control policy with a target or target range of the inflation rate.<sup>4</sup> Its main instrument is the Federal funds rate. Occasionally, the Federal Reserve Board of the US, Fed, has indulged in anti-cyclical monetary policy while making sure that the inflation rate remains in a two percentage band centered on 2%.

#### ***Figure 4 US Federal Funds Rate***

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<sup>4</sup> <http://www.frbsf.org/publications/federalreserve/monetary/goals.html>



Source Federal Reserve Board

This is consistent with the 1977 amendment of the Federal Reserve Act, which specifies that the Fed's monetary policy has two goals to promote "maximum" sustainable output and employment and "stable" prices". In periods of high inflation, the Fed has acted decisively to reduce the inflation rate even at the expense of a significant increase in the unemployment rate. In periods of significant slowdowns of economic activity, it acted decisively to stimulate economic activity even at the expense of an increase in the inflation rate. Figure 4 shows clearly the alternating pattern of the Federal Funds rate. It illustrates the Fed's monetary policy of alternation between fighting higher inflation and slowdowns of economic activity.

### ***The Federal Funds Rate and Economic Activity***

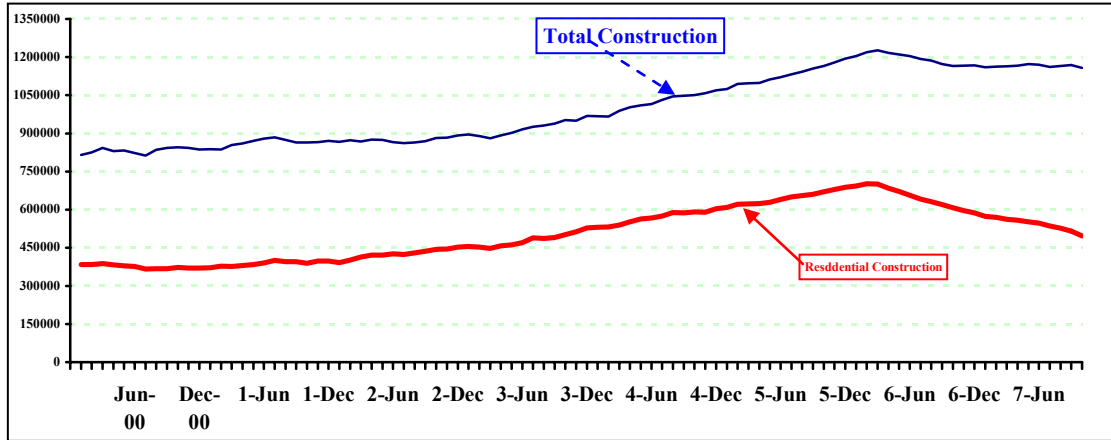
One of the channels through which changes in the Federal Funds rate affect economic activity appears to be the investment in residential construction, a component of aggregate demand. Figure 5.b shows that it represents about 4% of GDP. After the Fed started to reduce its Federal funds rate in 2001, investment in residential construction both in absolute level and as a percentage of GDP started to rise although with a certain lag. Similarly, after the Fed started to raise its Federal Funds rate in early 2005, investment in residential construction started to fall with a certain lag both in absolute level and as a percentage of GDP. Starting at the beginning of 2007, there were a slowdown and later a fall of investment in residential construction. The fall of investment in residential construction more than offset a growth of other investment in construction. Investment in residential construction contracted from March 2006 to November 2007 at the rate of 1.7% a month.

Figure 5.b shows that investment in residential construction increased from 4% of GDP in 2000 to a peak of 5.5% of GDP in December 2005 but it had fallen back to 4% of GDP by November 2007. The total decrease represented 1.2 % of GDP. While the change is substantial the ratio of investment in residential construction to real GDP did not fall substantially below its level in the previous peak of economic activity.

In contrast, the average price of houses and the volume of mortgage loans changed dramatically during this period, just as they did during the previous economic cycles except for one interesting

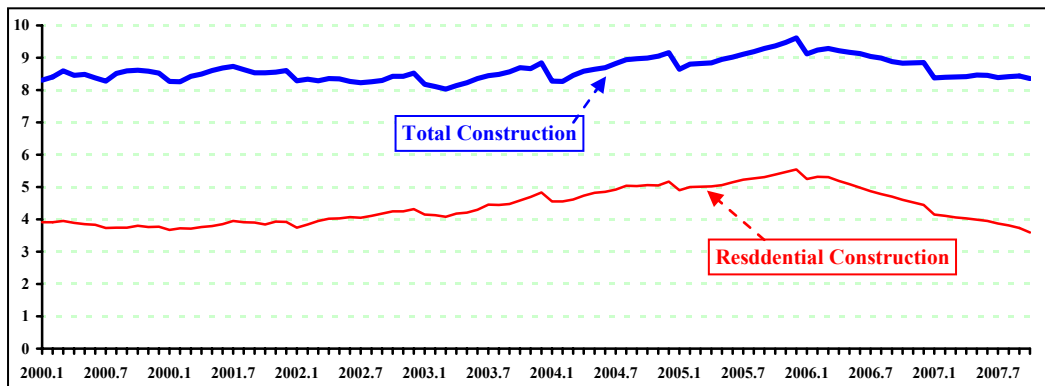
twist in the lending market. This is the appearance of a new type of credit instruments, the asset backed securities and the subprime loans.

**Figure 5.a US Total Construction and Residential Construction**  
 Current US dollars, Billions of US dollars, annual rates



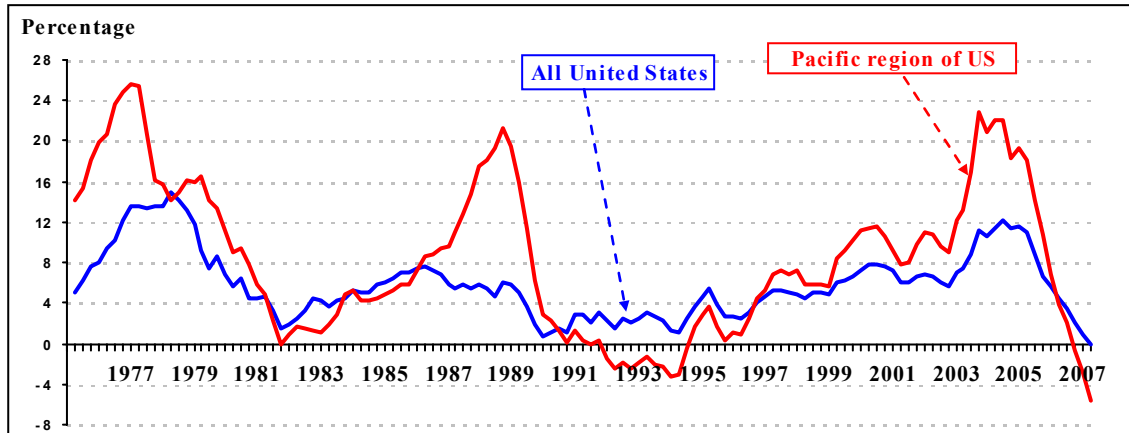
Source: <http://www.census.gov/const/www/sitemap.html>

**Figure 5.b US Total Construction and Residential Construction**  
 Percentage of GDP



Source: <http://www.census.gov/const/www/sitemap.html>

**Figure 6 House Price Inflation Rates for All US and the Pacific Region**

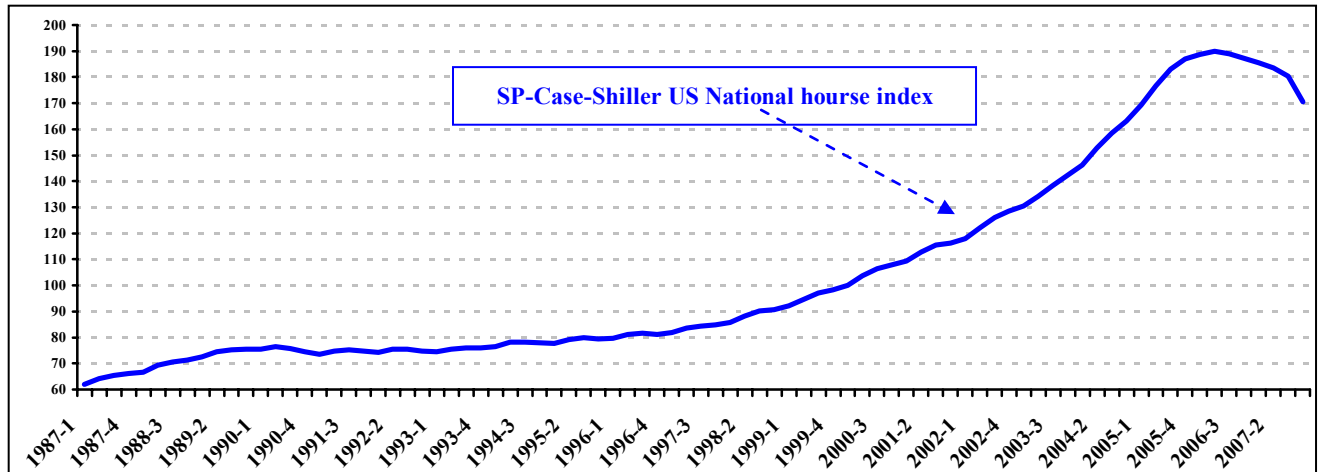


Source Office of Federal Housing Enterprise Oversight (USA), [http://www.ofheo.gov/hpi\\_state.aspx](http://www.ofheo.gov/hpi_state.aspx)

### ***The Federal Funds Rate and Average House Price***

Associated with the fall of the Federal Funds rate and the rise of residential investment during the period 2000-2005, there was, as figure 6 shows, a significant increase of the inflation rate of the average house price from 6% in 2000 to 12% or more in 2005. Thus, the average house price index registered a steep increase between 2001 and 2005. Similarly, there has been a continuous fall in the average house price in many regions of the US since the last quarter of 2007 following the increase in the Federal Funds and the fall in residential investment after 2006.

**Figure 7 S&P/Case-Shiller U.S. National Home Price Index**



Source: <http://www2.standardandpoors.com/portal/site/sp/en/us/page.article/0,0,0,0,1148433018483.html>

Figure 7 shows the steep increase in the S&P-Shiller house price index during the decade 1995-2005 and its subsequent fall thereafter. As figure 6 shows, however, the increase and the subsequent fall in the inflation rate of house prices during the decade 1995-2005 were not particular to the current business cycle. More significant acceleration and deceleration of inflation of house prices occurred in 1973-81 and 1982-90 business cycles. However, unlike in the previous business cycles the increase in the Federal Funds rate was accompanied this time with a tightening of the credit market that threatened to cause bankruptcy of several large financial institutions.

### ***The Federal Funds Rate and Credit Market Tightening***

The tightening of credit markets is associated with the increase in the proportion of non-performing loans, especially, subprime mortgage loans granted by certain credit institutions some of whom are subsidiaries of US banks. An example of such institutions is the credit institution CitiFinancial of New York, a subsidiary of Citibank the largest US bank. Due to the fall in house prices, the increase in the federal funds rate that the Fed has engineered from July 2004 until the middle of 2007 and the large number and total amount of sub-prime loans that it acquired, CitiFinancial found itself in a critical financial situation with a large number of non performing sub-prime loans. To rescue its investment in its subsidiary, the parent company Citibank provided CitiFinancial with liquidity that soon disappeared in the swirl of the whirlpool of nonperforming loans. Citibank sustained heavy losses and found itself also in a critical situation forcing it to seek and get from foreign financial institutions a total capital infusion of US\$ 21.5 billion in three months between November 2007 and February 2008. The decline in residential investment and the deterioration of the financial situation of some large financial institutions were serious enough that both the US government and the Fed acted promptly to rescue the US economy. To soften the impact of the decline in residential investment on

economic activity, the US government reacted by offering mainly tax rebates to stimulate consumption at the cost of US\$ 168 billion to the taxpayer. As figure 4 shows, the Federal Reserve Board reversed itself and reacted by lowering its fund rate from its peak of 5.28% in the middle of July 2007 to 3% at the end of February 2008 in a series of successive aggressive moves, the last of which was not approved unanimously by its board members.

### ***The Appearance and Development of Mortgage Backed Securities***

To help pull the housing market out of the 1929-1933 depression, the US government created a mortgage loan agency (Fannie Mae) in 1938 whose goal was to make available affordable housing to low income people. The agency was empowered to issue long and short term bonds and use the proceeds to buy and hold only Federal housing Agency (FHA) insured mortgage loan. In 1968, Fannie Mae went public and become a private shareholders owned company and it was authorized to buy mortgage loans that may or may not be FHA insured. In 1992, it was put under the regulatory authority and supervision of the Office of Federal Housing Enterprise Oversight (OFHEO) within the Department of Housing and Urban Development (HUD). Since its inception Fannie Mae has been essentially a long term development bank whose goal is to promote affordable housing for low income and underprivileged people.<sup>5</sup>

Currently, Fannie Mae purchases mortgage loans from lenders or originators and holds them. It also creates mortgage backed securities (MBS) for lenders out of their loans and guarantees the timely payment of interest and principle on the resulting MBS by supplementing mortgage collections as required to make up for any shortfall. In exchange for this service, Fannie Mae receives a fee. It is not clear whether the fee depends on the risks associated with the underlying loans. Unlike the mortgage loans that support them, MBS securities are tradable enabling investors other than financial institutions to hold them and diversify their portfolio without sacrificing liquidity. For this reason, Fannie Mae argues that MBS contribute to increase the funds available for investment in the affordable housing market.

At the same time that it privatized Fannie Mae, the US government created a second housing agency called Ginnie Mae. Unlike Fannie Mae, Ginnie Mae does not create, buy, or hold any credit instrument or asset. Its main function is to guarantee the timely payment of interest and principle of special MBS securities that it creates but does not hold. A Ginnie Mae's MBS is a pool of same type mortgage loans made by approved private lenders or originators and guaranteed or insured by one of four US federal government agencies.<sup>6</sup> Ginnie Mae MBS's are backed up by the faith and credit of the US government. The total value of Ginnie Mae MBS securities was US\$ 2.5 trillion in 2007 and they are traded worldwide giving US low income people who wish to own a house access to worldwide savings.

The US government has also created in 1970 another joint stock privately owned company called Freddie Mac. Freddie Mac buys mortgages and combines them into MBS's some of which it holds itself and some it sells to lenders or investors. It finances the purchases of mortgages by borrowing from banks, other lenders or by issuing bonds. Freddie Mac has three objectives, to provide a stable supply of funds for investment in housing, to provide for low and moderate

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<sup>5</sup> [http://www.fanniemae.com/media/pdf/fannie\\_mae\\_introduction.pdf](http://www.fanniemae.com/media/pdf/fannie_mae_introduction.pdf), p. 5-6

<sup>6</sup> These are the Federal Housing Agency, Department of Veteran affairs, the Department of Agriculture Rural Housing Services or Department of Housing and Urban Development's Office of Public and Indian Housing

income families an opportunity to acquire affordable housing and to increase the liquidity in the mortgage lending market. It comes under the supervision of the Office of Federal Housing Enterprise Oversight (OFHEO), an agency of the US department of housing and urban development. Unlike Fannie Mae and Ginnie Mae, the MBS's created by Freddie Mac are not in theory insured or guaranteed by the US government.

After the liberalization of interest rates in 1980 and building on the success of the Ginnie Mae and Fannie Mae MBS's, private financial companies followed the example and they created their own MBS's and Asset Backed Securities (ABS) without the guarantee of supplementing a shortfall of the collected interest and principle of the underlying loans or other securities. The private financial companies originate their own mortgage loans or buy mortgage loans from banks and other lending institutions or credit brokers and assemble them into a pool to make up their MBS security and then sell the security to investors and underwriters, including banks. The financial companies that make MBS's offer an after sale service of collecting the cash flow from the loans as it accrues and distribute it to investors for a fee. Since they offered no guarantee, the private financial companies did not have the incentive to check the quality of the assets used to make up their MBS or ABS. The underlying assets could be subprime loans to borrowers of low credit rating mixed with loans to borrowers with high credit ratings. The private financial companies did not have to look far for subprime they can create them themselves with a plethora of various marketing techniques and incentives.

### ***Definition of Subprime Loans***

Gramlich, (2004), defines sub-prime lending as lending that involves elevated credit risk. Most borrowers of sub-prime loans do not have good credit records or fail to demonstrate an income high enough to repay the loan's principle and interest. Most of these loans are originally made by non bank brokers some of whom don't bother to ask information about the income of the borrower or verify the borrower's income figure stated by the borrower in the application form. Lending to these borrowers involves a higher risk rewarded with the payment of an interest rate premium. The premium comes in many forms, higher interest rates, insurance fees in case of bankruptcy, and brokerage fees. These loans also require collateral and their loan to value ratio is significantly higher than for moderate or low risk loans called prime loans.

The collateral in mortgage loans is the real estate or the durable goods (cars) that were purchased with the loan. In some real estate backed loans, the loan is greater than the value of the real estate collateral. In others, the collateral for the loan is a second lien on the same real estate collateral. The average interest rate on sub-prime loans is at least two percentage points higher than the average interest rate on prime loans. For some category of subprime loans to borrowers with a weak credit record, the interest rate is three and half percentage points higher than the average interest rate on prime loans.

There are two species of subprime mortgage loans: Loans with a fixed interest rate (FRM) and loans with an adjustable interest rate (ARM), popular in real estate lending. According to Chomsisengphet and Pennington-Cross, (2006), The results of a survey conducted by Loanperformance the share of each specie of loans in the subprime loan market in 2004 was 50% of the number of loans. The most popular ARM is the 2/28. The maturity period of this kind of loan is 28 years. During the first two years the interest rate on the loan is relatively low (6%), At the end of the second year, the interest rate is set equal to an indexed rate such as the Libor interest rate augmented by 5% or more depending on the credit rating of the borrower and the loan to value ratio.

The option ARM is a variety of ARM that allows the borrower to pay less than the payment due on interest and principle subject to a minimum monthly payment. The difference is added to the principle until the total amount owed reaches 115% of the original loan. The option ARM loan allows a borrower to enjoy paying a lower interest rate for the first few years, which makes such loans attractive for people with a tarnished credit record.

A private credit agency evaluates the credit history of a borrower and assigns a credit score known as FOC credit score. FOC credit scores vary between 300 and 900. Subprime loans are loans to borrowers with a credit score less than 800. Gramlich, (2004) shows that in 2002 certain independent financial holding companies, five commercial banks, thrift institutions, and independent mortgage companies created respectively 43%, 27%, 13.8% and 11.8% of subprime loans. That is certain US banks have also indulged in creating subprime loans directly in addition to creating or buying subsidiaries that create and hold subprime loans.

### ***Fast Development of the Subprime loan market***

Before 1980, there was a cap in the US on interest rates that was too low to allow for a risk premium on subprime loans making it impossible to make those loans. The liberalization of interest rates in the US in 1980 allowed variable and arbitrarily high interest rates, making subprime loans possible. Since then subprime loans become available but they had a slow start. The attractiveness of subprime loans increased after 1986 when the government allowed deductions of interest payments from a borrower's income in computing income taxes owed to it, (Chomsisengphet and Pennington-Cross, 2006).

Clearly, the interest rate charged on subprime loans is higher the lower the FOC credit score. However, the tax treatment of interest payments on real estate loans helps to lower the real burden of the higher interest rates paid by borrowers with low credit scores. Chomsisengphet and Pennington-Cross, (2006) pointed out that, in low interest rate periods, a technique known as cash-out refinancing make subprime loans a cheaper source of financing consumption than consumer loans. Cash out refinancing means repaying a loan by borrowing a new larger loan and taking the difference in cash. This technique has become popular since 2001 as the Federal Reserve Board reduced short term interest rates from 2001 to 2004 to help the US economy recover from the 2001 recession.<sup>7</sup>

As figures 4, 6 and 7 show, the substantial increase in house prices during the same period across the US coincided with the fall in interest rates and the expansion of subprime lending. The steep increase in the average house price caused the loan to value ratios of old loans to decline substantially. When this happens, competition among lenders allows subprime mortgage loan borrowers to get larger loans at lower interest rates. Thus, unless there is a hefty prepayment penalty, subprime loan borrowers would repay their loans, refinance at a low interest rate, taking possibly a larger loan, and cash out the difference. They would use the cash taken out to finance consumption. To compensate the lenders, the originators of subprime loan contracts include a prepayment penalty equivalent to 10% of the loan, ([Bajaj](#) and [Story](#). 2008). Is such a high penalty necessary? If it is, it is not clear why should the taxpayer be on the hook when the financial institutions who indulge in such loans find themselves on the brink of bankruptcy.

The subprime loan market benefited also from the innovation of mortgage backed securities (MBS). As we argued above, many private credit agencies don't adhere to any rules in creating MBS. Some of them and some credit brokerage agencies specialize in the business of originating loans, packaging

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<sup>7</sup> This recession followed the burst of the dotcom bubble in 2000.

them into an MBS and offering after sale service. Driven by self interest, they create many kinds of loans to cater to the tastes of financially constrained people including those with bad credit records. Vying for the lucrative subprime loan business, some banks entered this business for their own account or by buying private agencies that have specialized in creating and managing MBS, hoping to take advantage of their own skills as underwriters. They have also participated in the business indirectly by buying the commercial paper issued by private credit agencies that originate subprime loans or by lending to them until the latter sell their MBS to other investors. Thus, the liquidity of the money market becomes crucial for the development and survival of the MBS and subprime lending markets.

The owners of private financial institutions, including banks, reckon they can shift the risk of subprime lending to the ultimate holders of the MBS, the investors who are seeking high rates of return, or to the Federal Reserve Board. Indeed, as if by a self-fulfilled prophecy, the Fed announced unexpectedly on March 11, 2008, that it would immediately expand its lending to banks and other credit institution by \$ 200 billion dollars and for a period of 28 days instead of overnight. It would also accept for collateral a broader base of securities, including MBS securities issued by federal agencies and private credit agencies of a grade no less than AAA. If the grade of the collateral MBS deteriorates, the Fed can ask for a better grade security. Essentially, the MBS issuers were correct in expecting that they can shift the risk to the Federal Reserve Board.

According to New York Times, subprime loans accounted for 21% of all outstanding loans in 2006 and 39% of mortgages made in 2006. In the third quarter of 2007, subprime loans accounted for 22%, of all outstanding loans, (Mortgage Bankers Association, 2007). ARM subprime loans account for two thirds of (first lien) subprime mortgage loans. (Bernanke, 2007) and approximately fifty percent of all subprime loans are ARM, (Chomsisengphet and Pennington-Cross, 2006).

ARM loans have the characteristic that when interest rates go up and the rate of increase of house prices is too slow or negative, they kick back harder. If house prices decrease the loan to value ratio becomes larger and may exceed 100 percent. Mortgage borrowers of such loans have low credit scores, they may have exaggerated their ability to pay to get the loan in the first place, and they may have lost their jobs. Those borrowers would simply walk away from their houses, (Bernanke, 2007).

Finally, the subprime loan market benefited from the interest of the government in finding means to increase accessibility to affordable housing. ARM subprime loans and MBS securities offered a way to increase the access without apparent additional financial burden to the government despite their deceptively low starting interest rates and other steep penalties for repayment before maturity. Low income borrowers who relied on house price appreciation would be keen on repaying and refinancing particularly before the interest rate on the loan is due for the steep upward adjustment. However, there are significant penalties (10% of the loan) for repaying a subprime loan, ARM or otherwise, before maturity. The subprime loan originators argue that the high penalty is needed to protect the lender's reward for making such risky loans (which in the case of an ARM loan the lender starts receiving when the interest rate is jacked upwards). The usual penalty on repaying prime loans before the loan's maturity date is about three months of interest payment, which amounts to 3 to 4% of the loan when the interest rate is 12%. In contrast, typically, the penalty for prepayment during the first five years of a subprime loan is six months interest, (Goldstein, and Strohauser Son, 2003). In 2004, 60% of subprime loans had a prepayment penalty, (Chomsisengphet and Pennington-Cross, 2006). Although this harsh penalty spelled out disaster if the house price increase slows down or the house prices fall, the government regulatory agencies turned a blind eye since subprime lending has benefited some of the financially constrained people allowing them to enjoy house ownership, (Gramlich, 2004). Gramlich provides evidence that the proportion of those owning their homes

among low income people increased substantially. The proportion of black people that owned their homes was 42.2% in 1993, and 48.4 % in 2003. Similarly, the proportion of white people that owned their homes was 70% in 1993, and 75.4 % in 2003, (Gramlich, 2004). Thanks to these benefits, the subprime loan market received the passive blessings and the encouragement of the US government through its implicit guaranties of the MBS's of Fannie Mae and Ginnie Mae. In 2008, those implicit guarantees were called in, the subprime market collapsed, and Fannie Mae and Ginnie Mae became technically bankrupt in September 2008 after house prices started falling at the end of 2007 and continued falling without an end in sight.

### ***The Financial and Economic Consequences of the Crisis of the Subprime Loan Market***

The boom of the subprime lending did not last for long. In 2006, 12.4 % of subprime loans were delinquent by more than two months. In September 2007, 20% of all subprime loans were delinquent by more than two months, (Loansubprime, 2007). In early 2008, twenty four per cent of subprime loans are delinquent or in foreclosure, (New York Times). In the third quarter of 2007, subprime ARM loans represented 6.8% of total loans but accounted for 43% of all foreclosures.

The chairman of the Federal Reserve Board argued in May 2007 that the problems of the subprime credit will not affect banks negatively and they will have little effect on economic activity, (Bernanke, 2007). However, the recent action on March 11, 2008 by the Federal Reserve Board and the succession of bank failures tell the opposite story. The difficulties of the subprime credit market have spread to banks.

The first major victim is Bear Stearns Companies, a financial broker and the fifth US bank (investment). On March 15 2008, it has requested and got financial support from the JP Morgan Chase bank. On March 16, 2008 and with the blessing of the Federal Reserve Board, JP Morgan Chase bank agreed to buy Bear Stearns Companies at two dollars a share, a deep discount compared to the price of more than \$170 that its shares fetched a year ago. Bear Stearns Companies lent to hedge funds to do bets on mortgage backed securities. Currently, it holds 16 billion of MBS, 15 billion in prime mortgages and \$2 billion in subprime assets. Since MBS have embedded in them subprime mortgage loans, the bank's holding of MBS are likely infected by the problems of the subprime market. The FED agreed to lend \$30 billion of MBS to JP Morgan Chase to cover its newly acquired exposure to MBS owned by Bear Stearns Companies. At the end of 2007, Bank of America lent \$2 billion to Countrywide Financial, a large mortgage lender and a bank and on January 11, 2008 it decided to acquire it for \$4 billion. Bank of America wrote off more than \$5 billion of bad assets.

On July 11, 2008 US regulators took over IndyMac Bancorp a large bank and mortgage lender with US\$ 32 billion.<sup>8</sup> The indulgence in lending "à tout vent" claimed more big fishes as the financial crisis deepened. The US federal Deposit Insurance Corporation (FDIC) seized Washington Mutual Bank on September 25 2005, one of the largest banks in the US, with US\$ 307 billion assets. This is the largest bank failure in US history. This bank's failure was due to the large size of its nonperforming mortgage loans. Under an agreement with FDIC, another large bank, JP Morgan Chase Bank, bought Washington Mutual Bank's banking assets for \$1.9 billion and will write down \$21 billion of bad loans. Insuring bad loans instead of holding them was a thin shield to wear in the financial crisis. On September 17 2008, the US government ordered the FED to lend US\$ 85 billion to American Insurance Group (AIG) for two years in exchange for a 79.9 percent equity stake in AIG. Then, on October 10 2008, the US government injected another

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<sup>8</sup> John Poirier and Rachelle Younglai Globe and Mail July 11 2008

US\$ 40 billion in AIG. In addition, to insuring bad loans the company acquired MBS and it incurred US\$ 18 billion worth of losses due to a drop in value of their holdings of securities tied to bad mortgage loans. On September 17 2008, another investment bank, Lehman Brothers Corp went bankrupt after the US treasury refused to provide it with a loan to help it wither the increasingly tight market of short term commercial paper. The US treasury secretary was adamant to bail out a private company since its management had a window of more than five months following the demise of Bears Stern Corp to raise its capital but it did not. Squeezed in the same way, the management of the famous Merrill Lynch, another large investment bank, offered the bank for sale at deep discount to Bank of America. Bank of America obliged and bought Merrill Lynch on September 17 2008. Lehman Brothers succumbed because of losses they sustained on US\$ 60 billion worth of nonperforming loans related to real estate. In turn Bank of America had to issue and sell US\$10 billion worth of stocks to rebuild its capital and absorb Merrill Lynch. On October 3, 2008, the US congress passed a law given the government the authority to borrow US\$ 700 billion to purchase the bad loans from financial institutions and increased the maximum deposit insurance from US\$ 100,000 to US\$ 250,000. The US government is planning to use part of the bailout money to buy non-voting shares in the financial institutions. The idea is to help financial institutions rebuild their capital, which was decimated by losses on their MBS holdings, and convince them to start lending to each other after they stopped renewing maturing loans and hoarding cash. Indeed, banks could not sell shares or get loans to raise their depleted capital and non financial institutions could not borrow short term or sell commercial paper to finance their day to day operation, a situation that could force them to layoff a large number of workers creating a whirlpool race to the bottom.

The decrease in residential investment and house prices and the seizing of credit markets exacted their toll on economic growth in the US. The interbank credit market and the market of corporate commercial paper dried up in September 2008. The number of foreclosures increased dramatically rising by 70% in California. Housing prices continued their decline making loan value ratios greater than one in some localities. Their owners found it practical to walk away from them and leave the investors who bought the corresponding MBS (banks, pension funds) no choice but to put the houses for sale, exacerbating the excess supply of houses and discouraging residential investment with deleterious effects on aggregate demand and employment. Contrary to the assertion of the chairman of the Federal Reserve Board in 2007, the US banks and the US economic activity were not safe. The annual growth rate of the US economy in the fourth quarter of 2007 was a meagre 0.6%, down from 3.8% and 4.9% in the second and third quarters respectively.<sup>9</sup> The unemployment rate increased from 5% in 2007 to 6.1% in august 2008. The lack of appropriate supervision and transparency of the subprime loan market and the US financial sector took its toll and it is now leading the US and most likely the rest of the world down to the path to a serious recession.

### ***The Federal Funds Rate and the Subprime Loan Market***

Should we blame inflation control for this state of affairs? Certainly, the aggressive decline in the federal funds rate from the beginning of 2001 until the end of 2004 may have encouraged the spread of subprime lending, especially in its more dangerous form ARM. The number of subprime ARM loans has declined and that of fixed mortgage rate subprime loans levelled off as the interest rate on these loans and the federal funds rate increased from 1996 to 2000. In early 2001, as the interest rate

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<sup>9</sup> UBS AG, did the same

on these loans and the federal funds rate decreased from 2001 to 2004, the number of both types of loans reversed direction and continued a strong climb upward until the end of 2003, (Chomsisengphet and Pennington-Cross, 2006). The interest rates on both fixed and ARM subprime rates increased from 1996 to 2000 to reach a peak of 12% and 10% respectively. Subsequently they tumbled to 6.5% in 2004. Therefore, it seems that movements of interest rates have contributed to the volatility in the number of subprime loans.

The development of the subprime market itself occurred before the fall in interest rates. The increase in interest rates reduces the availability of credit, which is crucial for the creation of new subprime loans. It also creates a stress on the ARM loan borrowers when the adjustment to a higher interest rate takes place and house prices start falling. During a period of increasing house prices, the ARM subprime loan borrower can pay the prepayment penalty out of a larger new ARM with a low starting rate. This was possible during the period 2000 to 2006. However, starting in the first quarter of 2006, house prices stalled and started falling in some areas; refinancing was not possible anymore. For those subprime mortgage loans with high loan to value ratio, new loans cannot be larger than the old loan and the difference cannot pay for the costs of the prepayment penalty and the fees for writing new loans. Selling the house would not produce either a price as high as that paid for buying it or a price sufficient to repay the loan, the prepayment penalty and other fees. The increase in the federal funds rate during the period 2004-2007, made it even more difficult for house prices to continue rising. Thus, it is not surprising that subprime ARM borrowers walk out of their houses and the delinquency rate and the foreclosure rate on those loans increased substantially.

Figure 8 provides evidence from the US subprime credit market that bears out this proposition. The evidence presented refers to subprime loans of relatively low credit scores borrowers (less than 800) dubbed B and C (BC) subprime loans. The horizontal axis represents the age of a subprime loan. The vertical axis represents the average delinquency rate. Each curve represents the proportion of the outstanding loans for a given vintage year (year of origination) that are delinquent for 60 days or more including those which are in the state of foreclosure. Clearly, for any given vintage year the average delinquency rate is higher for ARM loans than for fixed loans.

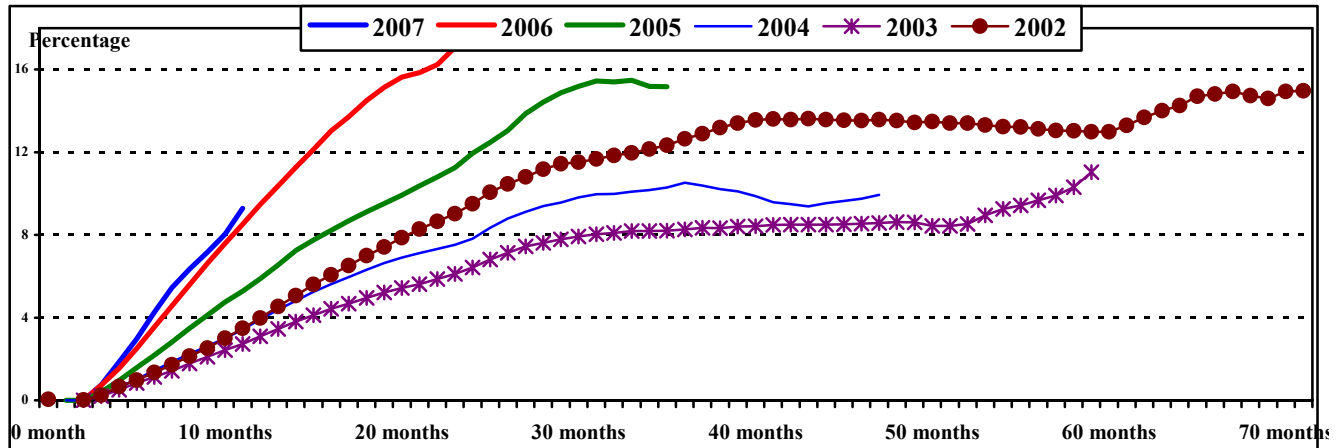
ARM loans of most recent vintage years, 2007, 2006 and 2005, with lower or stagnating house prices are more prone to delinquency than those which were contracted when house prices were rising and interest rates were relatively low from 2002 to 2004. Years 2003 and 2004 had lower interest rates and steeper house price increases than year 2002.

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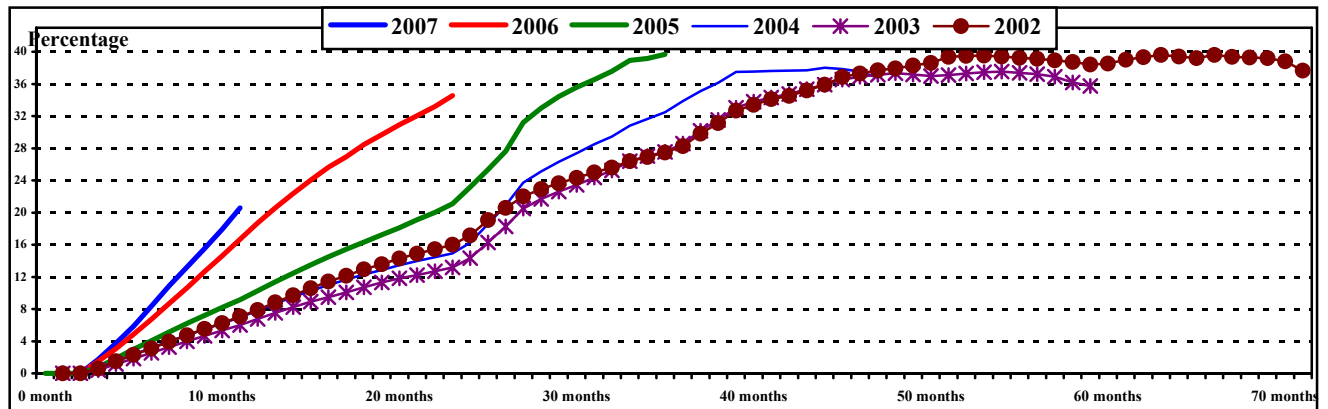
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Thus, it is not surprising that fixed rate loans originated in 2002 are more prone to delinquency than those originated in 2003 and 2004. Higher interest rates and levelling off of house prices contributed to make fixed loans for vintage years 2005-2006 and 2007 more prone to delinquency.

**Figure 8 Fixed Rate Subprime B and C Credit Scores**



**ARM subprime loans**



Source: [http://www.loanperformance.com/market\\_pulse/default.aspx](http://www.loanperformance.com/market_pulse/default.aspx)

The regression results obtained by Doms, Furlong and Krainer, (2007) show that change in house prices for 2003-2004, 2004-2005, 2005-2006 are important determinants of the delinquency rate among borrowers of subprime loans. These results confirm the above graphical analysis. Changes in house prices are negatively and significantly correlated with the average delinquency rate.

Changes in house prices are important because they are related to changes in interest rates. The Evidence from several countries shows that (real) interest rates are negatively correlated and availability of credit is positively correlated with house prices, (Tsatsaronis and Zhu, 2004). The effect of interest rates is stronger in countries where mortgage loans with variable interest rates represent a greater proportion of total mortgage loans, (Tsatsaronis and Zhu, 2004).

***Inflation control and the US financial crisis***

We may apply now the previous analysis to find out the implications for the conduct of a monetary policy based on inflation control. When monetary policy lowers the interest rate because the economy is in a recession and the inflation rate is low, house prices will rise sympathetically. The positive correlation between the rate of increase in house prices and the interest rate coupled with low interest rates encourage credit lending agencies to loosen credit restriction and look aggressively for borrowers. Buyers would include people who would want to live in a new house or investors who would want to buy houses for resale later. In the US, the competition for borrowers led credit lenders to create loans to a pool of borrowers with low credit scores and low income debt ratio. Many of

these credit lenders don't intend to keep the loans they make. They intend to originate, resell those loans in the form of mortgage or asset backed securities and then service them for a fee. They offered low starting rates and higher rates later with the hope for the borrower to make a profit from higher house prices. The hoped for increase in house prices is self fulfilling as long as there are would be borrowers of loans and buyer of houses. The higher demand couple with increasing house prices convinces house builders to borrow more to build new houses and secure credit to would be buyers. The credit market tightened and inflation pressures start to build up. For the US, profligate government spending for war and reduction in taxes to please the electorate added more pressures on the credit market and factor prices. The US economy was able to avoid unemployment rates lower than the natural rate of unemployment through the willingness of other countries to lend to the US in exchange for the US importing their goods. Parts of the imports helped to reduce inflationary pressures on consumption and building material.

Once the inflation rate started rising, the Federal Reserve board raised its interest rates to reduce the pressures. Unfortunately, the increase coincided with the readjustment of interest rates on ARM subprime loans and the exhaustion of the pool of reasonably low credit score borrowers. Investors in houses started selling to cash in on capital gains and house demand cooled off. House prices started to fall, the marginal borrowers with low credit scores and weak income capacity to service their loans could not pull out equity and they started also selling their houses to pay their loans since the hefty prepayment penalty ate up their equity. House prices fall more and some borrowers walk away. Builders have now excessive new house inventories and must compete with houses they built in previous years. They sell their excessive inventories at a discount, creating more pressures on house prices to fall and investment in housing falls. Employment falls and more risk for house owners with low credit scores. They cannot sell, they cannot refinance; they are delinquent. They and some of the investors who are late in selling have now a loan value ratio greater than one. It is logical that they would walk away from their houses. Certain investment banks cannot recover their loans and they cannot pay back their loans from commercial banks. They must fail. The Federal Reserve Board has no choice but to rescue both the insolvent banks and the commercial banks that lent to them or bought mortgage securities form them.

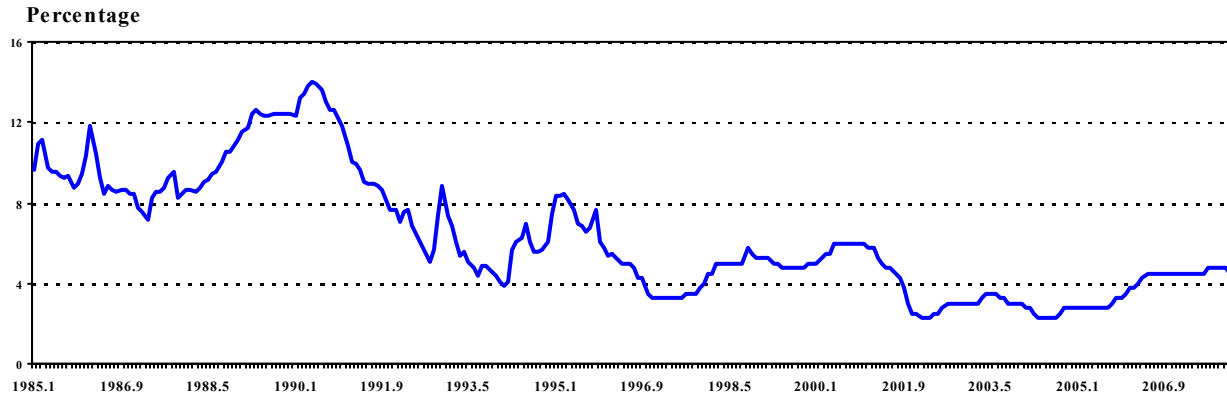
The Federal Reserve Board is now in a dilemma: should it fight inflation or allow it to flare up? It became "innovative" and abandoned ship ending up bailing out investors and credit originators while monetary policy is in limbo. The financial situation in the US is similar to that Japan during the early nineteen nineties, except that MBS's replaced land. The Federal Reserve concentrated on the official balance sheets of banks and treated investment in mortgage and asset backed securities as safer than investment in land. It is a failure of appropriate supervision of the entire credit market that created the financial crisis in the US. Berner and Grow (2008) show that the US Office of the Controller of the Currency, refused to listen to the plea of state attorneys general to allow them to supervision of national bank subsidiaries that operate in their states. Many of these subsidiaries were originally state chartered lenders who sold themselves to national banks to avoid stricter state supervision. Wachovia, a large national bank now bankrupt, (800 billion assets before going bankrupt in early October 2008), refused to open the lending books of its subsidiary in Michigan to the state financial regulator and the US Supreme Court upheld the bank's position with one dissenting judge. The state government and legislators were concerned about the lending practices of the subprime mortgage originators.

Clearly, it is not a monetary policy based on inflation control that is responsible for it. The Canadian experience that we shall discuss next will demonstrate this point.

## **The Canadian experience**

The Canadian experience serves as a control experience to show that it is the lack of focus of monetary policy, the lack of an appropriate supervisory system and other deficiencies in the financial system that are at the origin of the recent financial crisis in Japan and the US. The Canadian economy did experience strong growth since 1992 and there was a long and steep increase in real estate prices since 1995. The government of Canada did seek actively to make credit available for the development of affordable housing through in particular the development of asset backed securities and subprime lending. Finally, the official goal of the Canadian monetary policy is to control inflation. Yet, there has been so far no financial crisis in Canada.

**Figure 9** *The Bank rate of the Bank of Canada*



Source: <http://www.bankofcanada.ca/en/rates/interest-look.html>

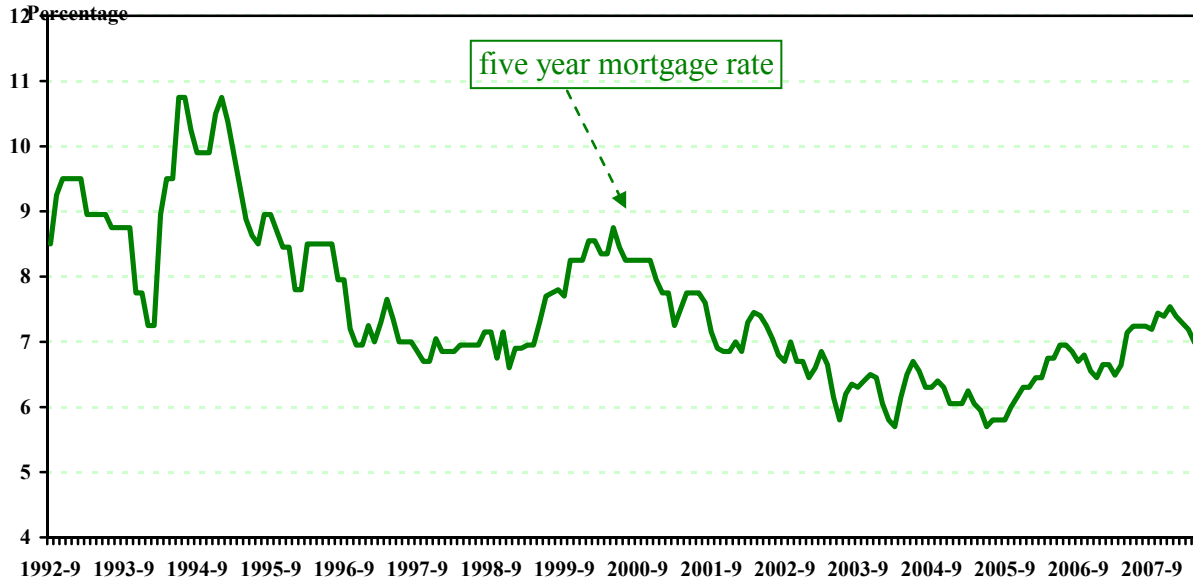
Since 1992, the mandate of the central bank of Canada, BC, has been to keep the inflation rate within a band of two percentage points centered at 2%. BC has largely succeeded to maintain the inflation rate within that band since 1996. Like the Fed and as figure 9 shows, BC started in the beginning of 2001 to lower its bank rate in small steps after the onset of the 2000 recession and kept it low at 2.25% until September 2004 to help the Canadian economy avoid a deflation. In fact, Canada experienced a shallow and brief recession and BC started to raise its bank rate in September 2004 to its current level of 4.5%.

The increase in the BC bank rate was not substantial but it was enough to keep the inflation rate within the targeted band. Although the average mortgage rates increased by the same order of magnitude, the increase was not substantial. Thus, it did not have a significant effect on residential investment, credit to resident mortgage credit and the average house prices.

#### ***Monetary policy and mortgages rates***

Figure 10 shows that the mortgage fixed rates for one year and five years term loans amortized over 25 years started falling in 2001 after a slight rise from 1997 to 2000. In March 2004, the five year term mortgage rate started to rise from a low of 6.15% to reach 7.54%. That is an increase of 1.4 percentage point smaller than the increase of 2.25 percentage points in the bank rate over the same period, which increased from a low of 2.25% to 4.5%.

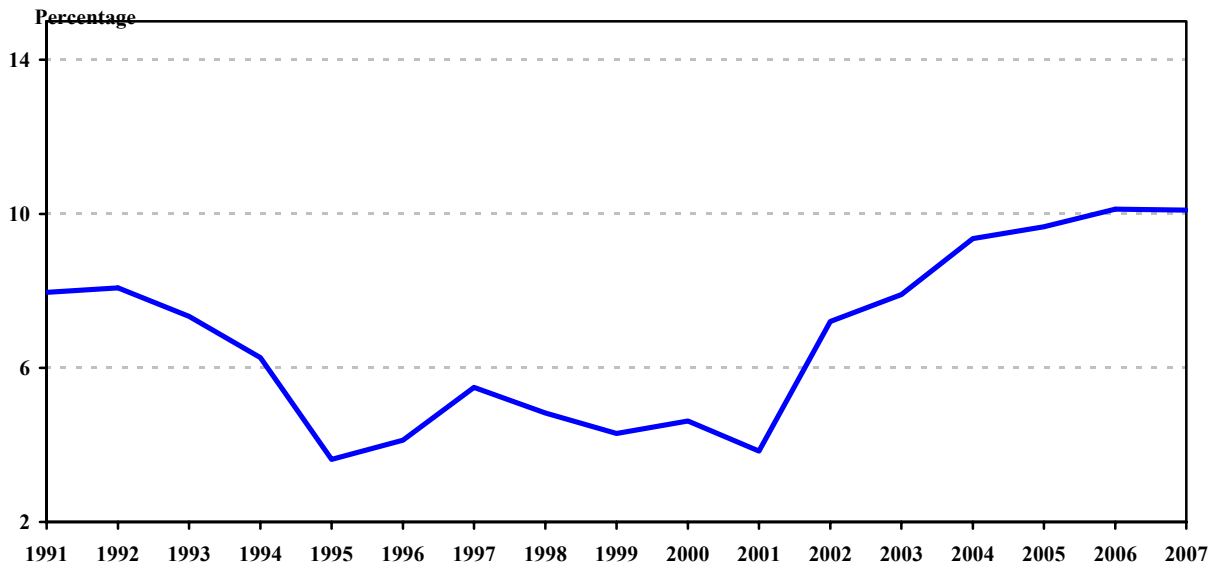
**Figure 10** *Canadian Banks Average Fixed Mortgage Rates*



Source: [http://www.bankofcanada.ca/pdf/annual\\_page48.pdf](http://www.bankofcanada.ca/pdf/annual_page48.pdf)

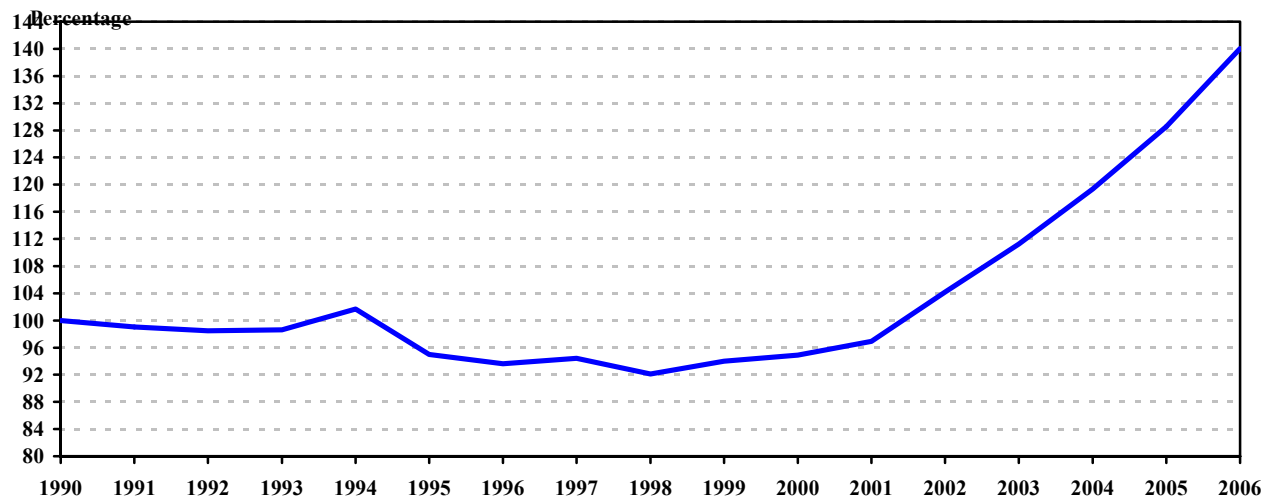
The one year term rate started to rise in September 2004 from a low of 4.4% to reach 7.35% at the end of 2007. This increase is about three percentage points, 0.75 percentage points greater than the increase in the bank rate. All three mortgage rates are still 0.5 percentage points lower than the level they reached in 2000.

**Figure 11 Growth rate of mortgage credit lending**



Source: [http://www.cmhc-schl.gc.ca/en/corp/about/cahoob07/data/data\\_005.cfm](http://www.cmhc-schl.gc.ca/en/corp/about/cahoob07/data/data_005.cfm)

Undaunted by the increase in BC's bank rate and the mortgage rates, the mortgage credit lending continued to grow despite the increase in the bank rate and the mortgage rates. In fact, as figure 11 shows, the growth rate of mortgage credit lending itself continued to increase to reach 10% in 2006 and 2007.

**Figure 12 Average house prices in Canada**

Source: Canadian Mortgage and Housing Corporation, <http://www.cmhc-chl.gc.ca/en/corp/about/cahoob07/index.cfm>

The behaviour of house prices confirms the lukewarm effect of the rise of interest rates on the housing market. As figure 12 shows, real house prices have started a steep increase since 2000 despite the rise of the bank rate and the mortgage rates since September 2004. Unlike that of the US, the Canadian economy did not experience a serious financial crisis

#### ***The importance of appropriate supervision of the financial sector***

Like the US government, the Canadian government has made an effort during the last three decades to make it easier for low income people to purchase affordable housing. This included the development of a subprime loan market and a market for asset backed securities. However, although the Canadian subprime market did experience some difficulties, it has not yet spawned a financial crisis for several reasons.

First, the share of subprime loans in total mortgages in Canada grew from about 2% in 2001 to 4% in 2006 while the share of subprime loans in total mortgages in the US grew from about 7% in 2001 to more than 22% in 2005 and 2006, (Financial System Review, 2007, p. 4).. The much slower development of the subprime market in Canada is due to the confinement in Canada of subprime lending to near prime borrowers. Furthermore, the premium charged by one subprime lender for five year term subprime loans was only one percentage and a half higher than the mortgage rate charged by Canadian banks. The confinement of subprime lending to near prime borrowers produced also a delinquency rate on subprime loans in Canada (percent in arrears over 90 days or in foreclosure) that was about 1% in 2002, 0.5% in 2004, and 1% in 2006, (Financial System Review, 2007).

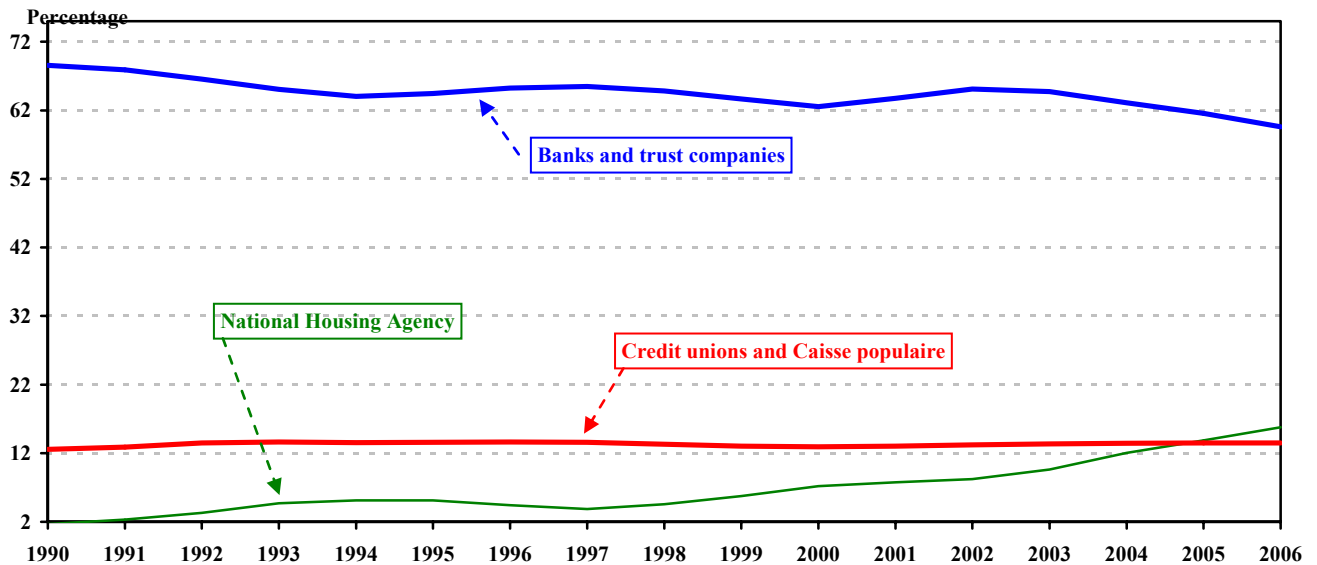
A strong positive correlation across the states of the US between the rate of house price increases and the share of subprime mortgage loans in total mortgage loans attests to the importance of house price increases for the development of a poorly supervised US subprime lending market.<sup>10</sup> This correlation along with the absence of proper supervision explains the proliferation of ARM subprime loans in the US. As it was argued in the previous section, ARM mortgage loans with rising house prices and improper supervision of credit are recipe for creating financial instability.

<sup>10</sup> For a diagram showing the close correlation see chart 7, page 7, in Financial System Review, Bank of Canada, June 2007.

Unlike in the US, there are no ARM loans in Canada. Instead, variable rate mortgage loans and short term mortgage loans have become popular in Canada. In 1999, they accounted for 5% of total residential mortgage loans. In 2003, they accounted for more than 20% of total residential mortgage loans<sup>11</sup> and in 2005 they accounted for 30% of all residential mortgages, (Tractlet, 2005). Variable rate mortgage loan allow borrowers to take advantage of lower interest rates. However, variable mortgage rates do not make borrowers less vulnerable to increases in interest rates although they make it harder for financially constrained borrowers to keep up with large rate increases. In Canada, the risk for low income mortgage borrowers of large increases in interest rates is not substantial since BC has succeeded in maintaining a low inflation environment, low nominal interest rates and in building strong credibility for its monetary policy of inflation control.

Figure 10 shows the enhanced stability of mortgage rates since the early nineteen nineties when BC adopted a monetary policy of inflation control. The three percentage increase of the average one year term mortgage rates between September 2004 and the end of 2007, in step with the increase in the bank rate by 2.25% over the same period in accordance with the requirement of the monetary policy of inflation control, did not cause a financial crisis in Canada.

**Figure 13 Structure of the mortgage credit suppliers in Canada**



Source: [http://www.cmhc-schl.gc.ca/en/corp/about/cahoob07/data/data\\_005.cfm](http://www.cmhc-schl.gc.ca/en/corp/about/cahoob07/data/data_005.cfm)

The variable rates did increase of course, but house owners with variable rates mortgage loans and financial constraints did take advantage of lower rates in the previous easy years. However, the lower rates did not induce them to get large loans hoping to pay for them with higher house price increases since they could not service their debt by increasing their loans along with the increase in house prices. Furthermore, as we shall see shortly mortgages with high loan to value ratio must be insured in Canada. Thus, mortgage loans with variable rates are not equivalent to fixed ARM subprime mortgage loans

<sup>11</sup> See chart 14, p. 11, Financial System Review, Bank of Canada, June 2004.

A second reason is that the originators and long term holders of mortgage loans in Canada are mainly banks, various credit unions, and the National Housing Agency, an arm of the government of Canada, created under the National Housing Act to encourage the provision of affordable housing for low income households. Figure 13 shows that the development of the subprime market did not dilute the share of these financial institutions although the Canadian bank law has changed to allow for universal banking. Banks used to have a much smaller share of mortgage loans than the 59.6% they had in 2006. They achieved this dominant position thanks to the change in the banking law that allowed them to merge with trust companies and insurance companies. Mortgage loans by banks and credit unions, which are banks, accounted in 2006 for more than 70% of total mortgage loans in Canada. This share rises to more than 80% when we add the mortgages originated and held by the National Housing agency. This fact is important for the stability of the financial system since all lenders in Canada are under the supervision of the Office of Superintendent of Financial institutions and the Canadian Deposit Insurance Corporation. Furthermore, mortgage brokers are regulated by the Provincial Mortgage Brokers act.

The third reason is that Canadian law requires that loans with a loan to value ratio exceeding 75% granted by federally regulated financial institutions (including banks and non banks) must carry insurance for 25% of the mortgage loan. A loan insurer accredited by the Superintendent of Financial Institutions must provide the insurance. The largest insurer is the Canadian Mortgage Housing Corporation, CMHC. In practice, the insurance premium and coverage apply to the whole loan. This insurance requirement became more relevant as federal law was loosened to allow for a loan value ratio close to 100%. Furthermore, there are conditions that the borrowers must satisfy to obtain insurance and therefore a loan (of a loan value ratio greater than 75%). The total of yearly loan servicing charges (including principal and interest payments, property taxes, heating costs and other related expenses) must not exceed 32% of the gross annual household income and the total annual debt (including all other debts) servicing charges should not exceed 40% of the gross annual household income, (Tracllet, 2005) .

**Table 1 Insurance Premiums for Mortgage Loans in Canada (in % if loan), 2006**

Loan to value ratio	Premium on total loan: standard	Premium on total loan for self employed
Up to 65	0.5	0.8
Up to 75	0.65	1
Up to 80	1.	1.64
Up to 85	1.75	2.9
Up to 90	2	4.75
Up to 95	2.75	6
90-95 flexible	2.90	NA
95-97	2..9	NA
97-100	3.1	NA

Source: [http://www.cmhc-schl.gc.ca/en/hoficlincl/moloin/hopr/upload/Quick-Reference-Guide\\_05-01-08\\_E.pdf](http://www.cmhc-schl.gc.ca/en/hoficlincl/moloin/hopr/upload/Quick-Reference-Guide_05-01-08_E.pdf)

The insurance premium rate for a mortgage loan depends on the loan to value ratio and favours mortgage loans with low loan to value ratio as shown in Table 1. It is higher for self-employed with a maximum of 4.75% for s self employed borrower and a 95% loan to value ratio, see Table 1. The insurance means that the federal government of Canada guarantees repayment of an insured loan's principal and interest loans in addition to the insurer's guarantee. Thus, delinquency of payments of interest and/or loan is not of much concern to the lender or investor since that the latter is able to recover the full loan and interest.

Furthermore, since the premium is risk weighted, and CMHC must insure that all prudential rules are satisfied, it follows that the taxpayer runs little risk of bailing out speculators or lenders.

### ***Implications of the Canadian experience for monetary policy***

The Canadian experience shows that it is not the behaviour of house prices, the creation of new financial instrument, lack of strong regulation, or the adoption of a monetary policy of inflation control that are responsible for financial crises and the resulting dislocation of economic activity. More likely, it is the lack of appropriate enforcement of prudential rules to some section of the financial sector that is responsible for the development of financial crises.

### **Conclusion**

Unlike Japan, Canada has created an appropriate regulatory system of the entire credit system. A member of the board of governors of the Bank of Japan acknowledges the rudimentary nature of the Japanese regulatory system prior and during to the lost decade in Japan when the Japanese financial crisis was roaring. He also acknowledges the laxity in and the lack of independence the Japanese supervision apparatus. Although the US has a similar and possibly more efficient regulatory system, the US government has failed to apply it rigorously and to the entire credit system. In this paper, I have attempted to show that this is the only significant difference between the Canadian experience on the one hand and the Japanese and the US experiences on the other hand, except for the fact that Canada has experienced a boom in the oil sector as the subprime crisis roared in the US. This fact cannot account for the escape of the Canadian economy since the US economy's construction sector was also booming and the US government was also waging a war during the time when the US financial crisis developed. In fact, the Canadian economy was under more exacting conditions since the monetary policy of the Bank of Canada was clearly and irrevocably dedicated to inflation targeting and not just to inflation control. It is difficult therefore to escape the conclusion that it is not a monetary policy dedicated to inflation control that is responsible for the financial crisis in the US or Japan. It is rather the lack of an independent and efficient regulatory system and a rigorously applied supervision or the lack thereof that are responsible. This is a valuable lesson for developing countries, which like Japan and the US, lack a responsible and independent regulatory and supervision system or they lack the will to apply it rigorously and to the entire financial system.

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