

# Household debt, the savings rate and monetary policy: the Korean experience

Kyuil Chung<sup>1</sup>

## Introduction

Korea experienced a rapid increase of household debt in the early 2000s. The heavy burden of debt repayment in the household sector has made the Korean economy less stable. Specifically, the surge of household debt has caused the household savings rate to fall and thereby heightened the volatility of private consumption. Given this environment, it is essential for the central bank to conduct monetary policy appropriately to mitigate consumption volatility.

We first describe the expansion of household debt and its consequences. We then examine how the decline of the savings rate affects the responses of economic variables to monetary policy shocks and what the desirable monetary policy is.

## Surge in household debt and its consequences

Korean household credit<sup>2</sup> provided by depository corporations and non-bank financing corporations has increased sharply since 2000. As Graph 1 shows, Korean household credit outstanding increased from around KRW 200 trillion (about US\$ 200 billion) in 2000 to KRW 450 trillion in 2002, more than doubling within two years. While loans to households were the main factor behind the rise in household credit, merchandise credit, which is provided mainly by credit card companies, also played an important role (Graph 2).

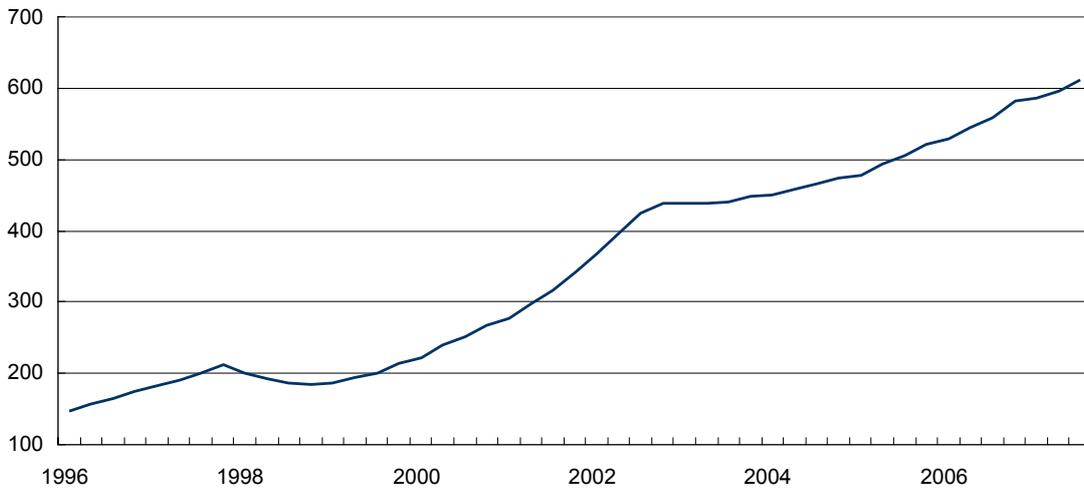
There are several possible causes of this rapid expansion of household debt. Let's look first at the Korean macroeconomic indicators. As shown in Graph 3, Korea experienced a severe recession, with a negative 7% GDP growth rate, during the Asian financial crisis of 1997–98. On the other hand, inflation was quite stable after the crisis due to low global inflation. The Bank of Korea therefore adopted an easy monetary policy stance, and interest rates remained at relatively low levels, with the policy rate (one-day call rate) in the range of 3–5% (Graph 4). This low interest rate environment was the main reason household debt soared. Another reason was skyrocketing housing prices. Fuelled by limited housing supply during the 1990s and ample liquidity since the crisis, housing prices have risen steeply since 2001 (Graph 4).

---

<sup>1</sup> Bank of Korea.

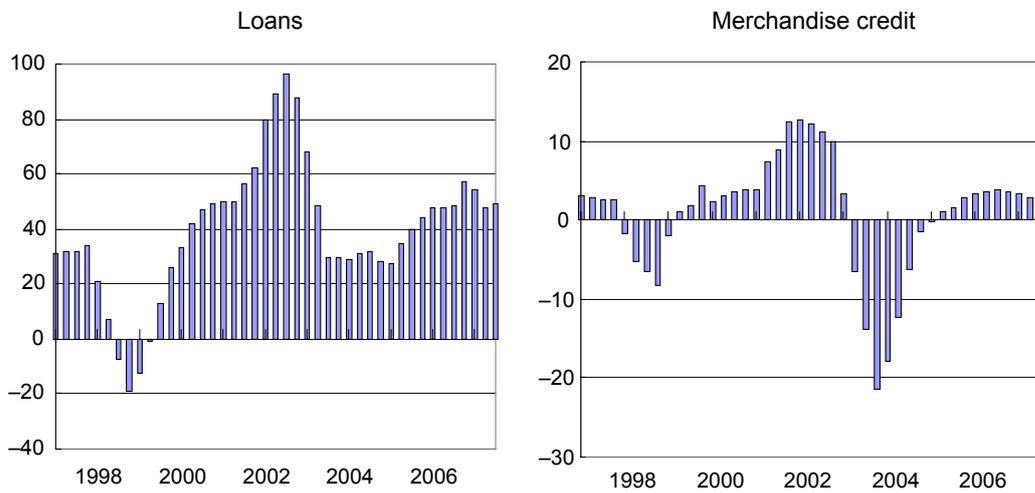
<sup>2</sup> This includes loans (general loans to households such as loans for housing, cash advances and car loans, etc.) and merchandise credit.

Graph 1  
**Trend of household credit**  
 Balance, in trillions of won



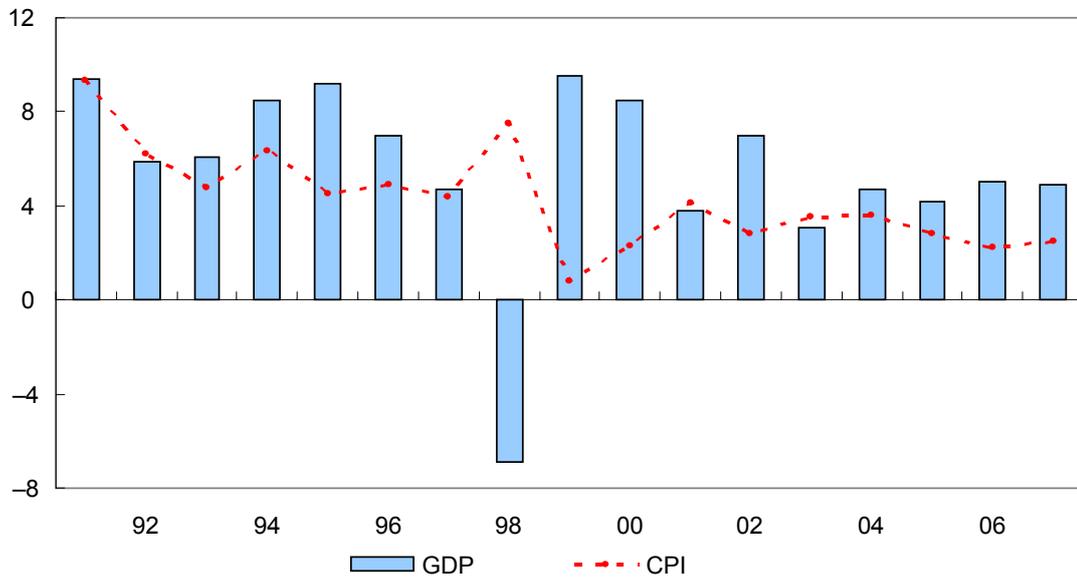
Source: Economic Statistics System (ECOS), Bank of Korea.

Graph 2  
**Trend of increase in household credit**  
 In trillions of won



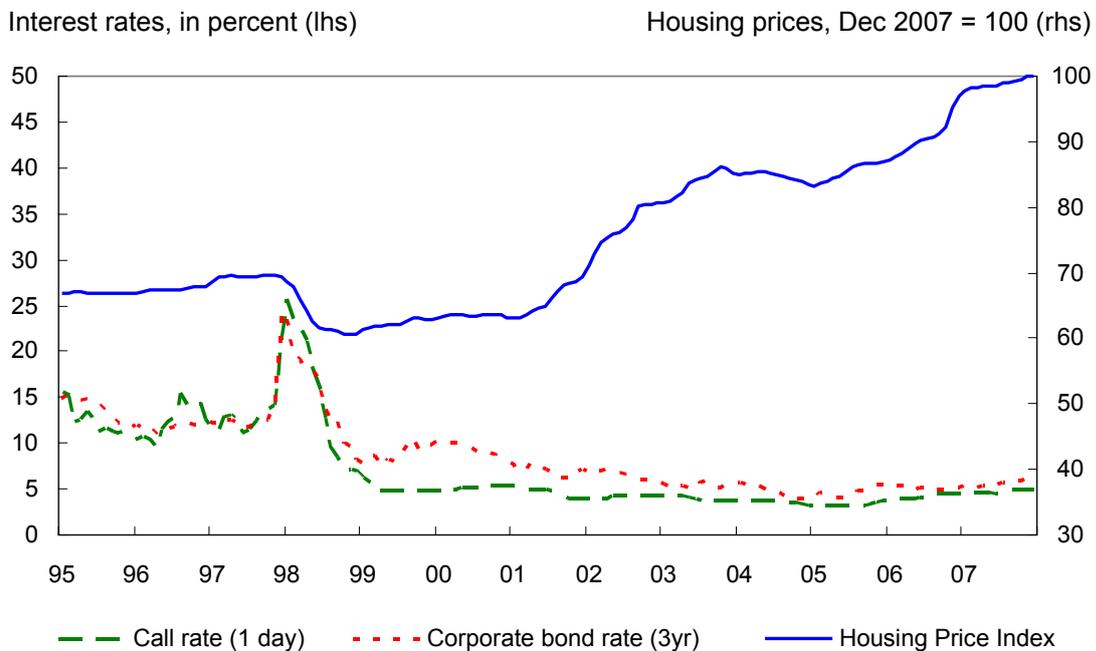
Source: Economic Statistics System (ECOS), Bank of Korea.

Graph 3  
**Trends of GDP growth and CPI inflation**  
 In per cent



Source: Economic Statistics System (ECOS), Bank of Korea.

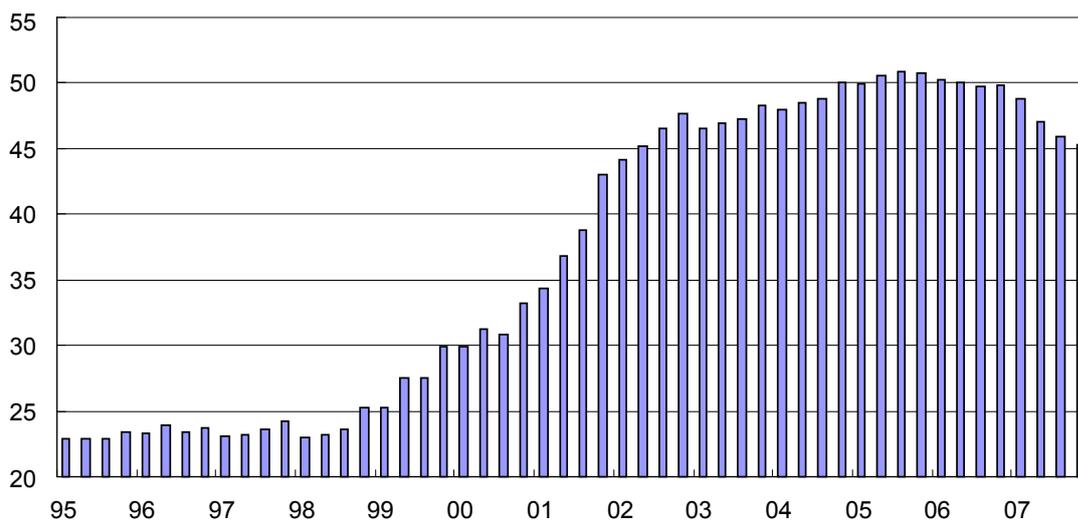
Graph 4  
**Trends of housing price index and interest rates**



Source: Economic Statistics System (ECOS), Bank of Korea.

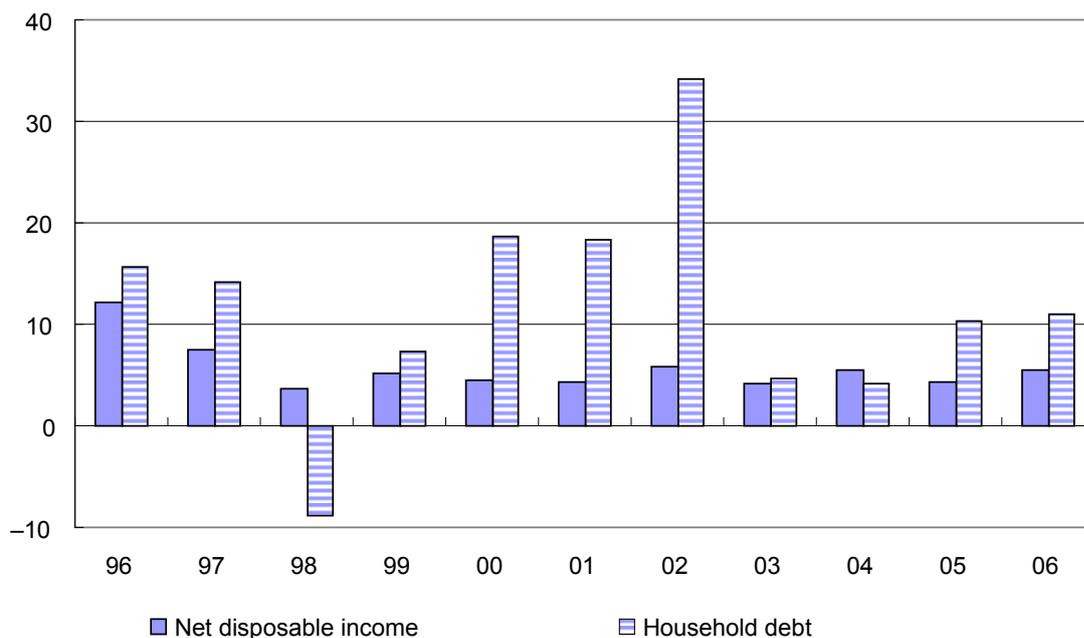
On the supply side, corporate demand for funds was greatly blunted due to financial restructuring in the corporate sector and the economic slowdown that followed the financial crisis. Hence, financial institutions expanded their businesses aggressively to the household sector. Graph 5 shows that the share of household loans in total loans extended by financial corporations increased rapidly, from less than 25% in 1997 to nearly 50% in 2002.

Graph 5  
**Share of household loans in total loans**  
 In per cent



Source: Economic Statistics System (ECOS), Bank of Korea.

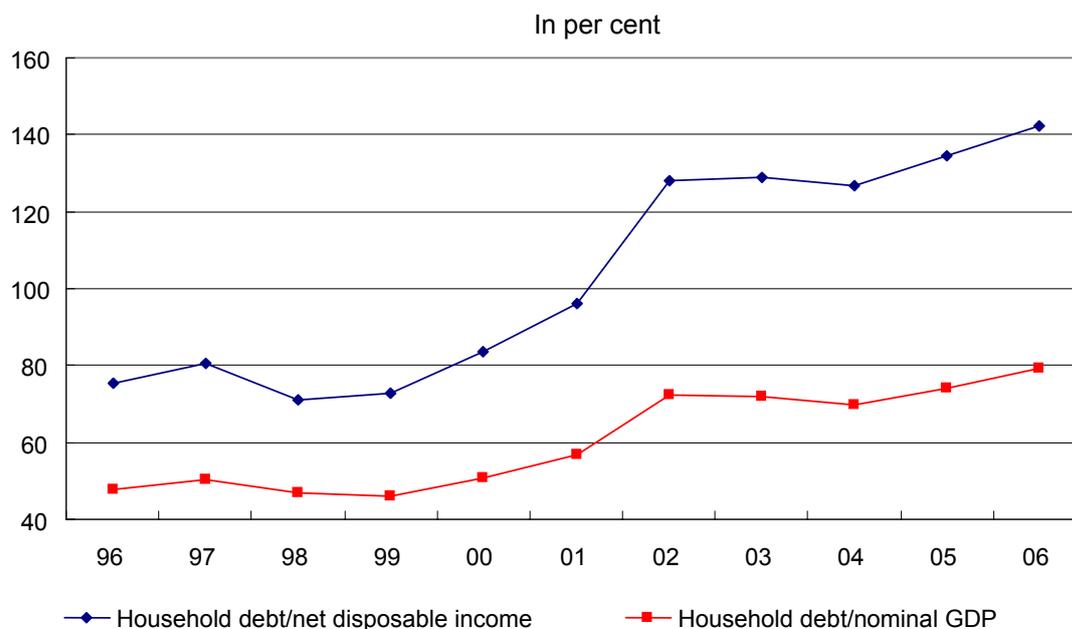
Graph 6  
**Growth trends of net disposable income and household debt**  
 In per cent



Source: Economic Statistics System (ECOS), Bank of Korea.

This rapid increase in household debt has not continued without negative consequences. As shown in Graph 6, the rate of growth of household debt<sup>3</sup> exceeded that of household net disposable income by a large amount between 2000 and 2002. Hence, household financial indicators such as the ratios of household debt to net disposable income and of household debt to nominal GDP have severely deteriorated since 2000 (Graph 7).

Graph 7  
Trends of household financial indicators



Source: Economic Statistics System (ECOS), Bank of Korea.

Reflecting these weak financial conditions, the household net savings rate, which had maintained a level of 15–16% before the financial crisis, plummeted to 9.9% in 2000 and then to 2.0% in 2002, before increasing slightly, to 3.5% in 2006 (see Table 1). This pattern would appear to indicate a gradual rise in the proportion of households living from hand to mouth – ie using current income for current consumption – compared to households that smooth consumption over time by increasing and decreasing savings as circumstances dictate.

As shown in Graph 8, which divides Korean workers into five groups according to income, the savings rate of those with the highest incomes (Group 5) did not change much between the pre- and post-crisis periods, except for a temporary rise in 1998, during the crisis period. The savings rates of the middle class – Groups 2, 3 and 4 – have fallen dramatically due to the crisis. For example, the savings rate of Group 2, which held steady at 20% before the crisis, dropped to approximately 10% after the crisis. Moreover, the savings rate of households in the bottom 20% (Group 1), which was low before the crisis, has been negative since the crisis – ie households in this income group have resorted to borrowing.

<sup>3</sup> Based on financial assets and liabilities data in the national flow of funds account.

Table 1  
Trend of household net savings rate<sup>1</sup>

In per cent

1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
16.4	15.1	23.1	16.2	9.9	5.9	2.0	3.6	5.7	4.2	3.5

<sup>1</sup> Obtained by dividing net private sector savings in the national accounts by net adjusted disposable income.

Source: Economic Statistics System (ECOS), Bank of Korea.

The savings rate of Group 1 was –8% in 1998, declined to –15% in 1999, recovered to –10% for the next three years and deteriorated again in 2004, to –17%. This indicates that the number of households living from hand to mouth seems to have risen rapidly since the crisis and can be estimated to account for over 20% of Korean households.<sup>4</sup>

According to the permanent income hypothesis, the main function of savings is smoothing consumption. When current income is below permanent income, households withdraw money from their bank accounts and spend it on consumption. On the other hand, when current income is above permanent income, households save the extra money to prepare for possible negative income shocks in the future. Therefore, the decline of household net savings rates weakens consumption smoothing. The empirical evidence for this phenomenon will be provided below.

Another important point that should be mentioned here is the relationship between borrowing and consumption smoothing. Since borrowing is negative saving, it plays a role in smoothing consumption as long as it is temporary. However, if negative saving persists, borrowing can also constrain consumption smoothing by increasing the debt servicing burden. According to the Korea National Statistical Office, the ratio of debt redemption to disposable income<sup>5</sup> increased from 16.1% in 1999 to 24.8% in 2005. This vicious circle (consumption financed by borrowing → increased debt redemption → sharp reduction in consumption) has been one of the main causes<sup>6</sup> of private consumption volatility in Korea since the financial crisis.

Looking at the volatility (standard deviation) of GDP growth and private consumption growth rates during the periods before and after the financial crisis (Table 2), we find that from the first quarter of 1985 to the second quarter of 1997, private consumption was more stable than GDP, with growth rate volatilities of 1.52 and 1.97, respectively. However, the volatilities of GDP and private consumption growth increased to 2.58 and 4.32, respectively, between the first quarter of 1999 and the third quarter of 2006. Private consumption volatility thus contributed to the increase in the volatility of GDP growth.

The reversal in the comparative volatilities of GDP and private consumption is visible in the trends of the growth rates of the two indices. Graph 9 shows that, before the crisis, the private consumption growth rate was lower than the GDP growth rate during a period of expansion and higher than the GDP growth rate during a period of contraction. Since the crisis, however, private consumption has contracted dramatically during economic declines

<sup>4</sup> Considering that the savings rate of Group 2 fell steeply, from 20% to 10%, a considerable proportion of that group consists of households living from hand to mouth and unable to save.

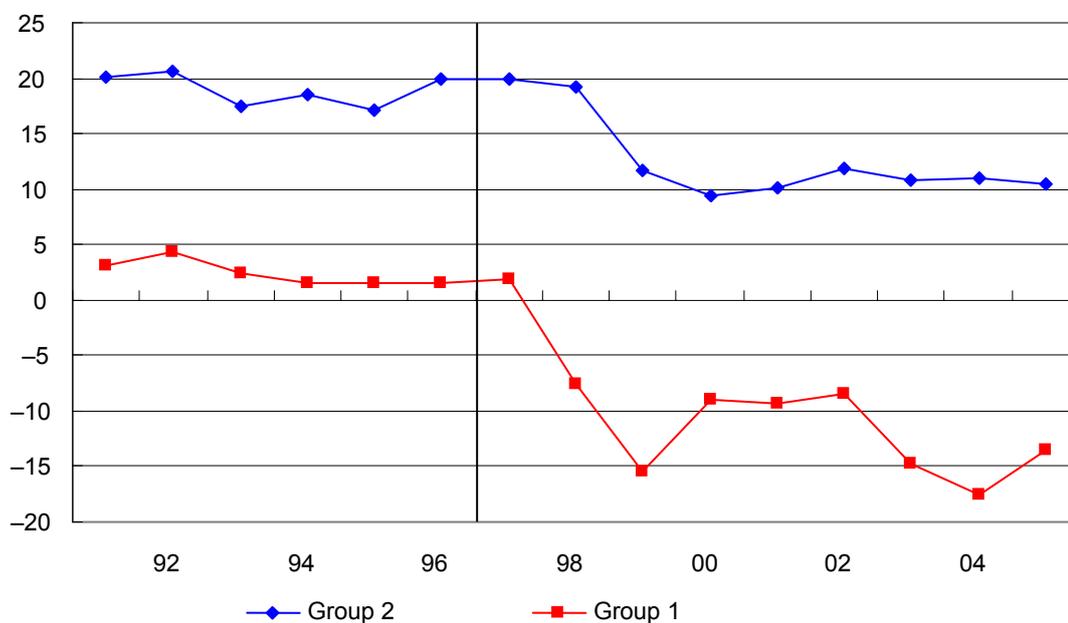
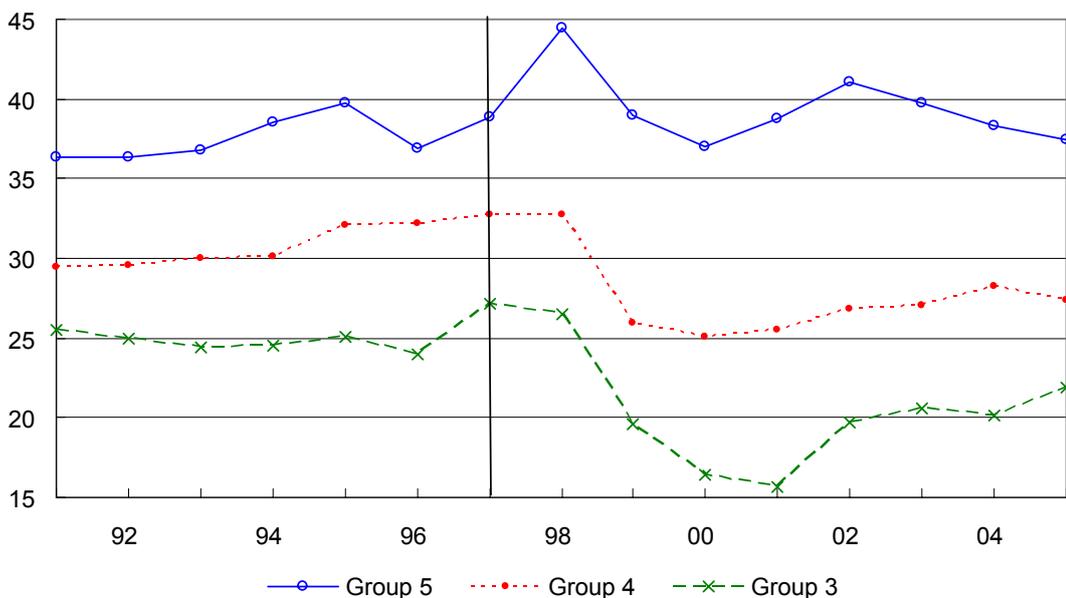
<sup>5</sup> *Annual report on household income and expenditure survey*, Korea National Statistical Office.

<sup>6</sup> The increased share of transportation, communication via mobiles and internet and leisure activity in total consumption is mentioned as another reason for consumption volatility, since these items are very sensitive to business cycles.

and increased sharply during economic upswings. Thus, we can see that private consumption played the role of a buffer against the business cycle before the crisis but has exacerbated economic fluctuations since then.

Graph 8  
Trends of savings rates by income group<sup>1</sup>

In per cent



<sup>1</sup> Group 5 consists of the households with the highest incomes; Group 1, the lowest.

Source: *Annual report on household income and expenditure survey*, Korea National Statistical Office.

Table 2

**Volatility and components of GDP growth**

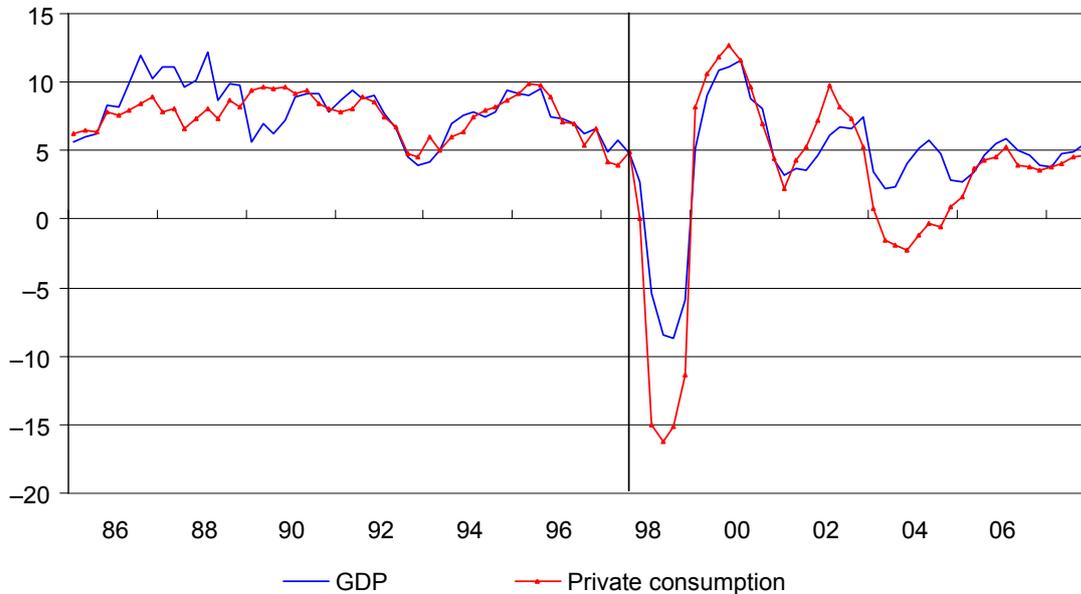
	<b>GDP</b>	<b>Private consumption</b>	<b>Gross investment</b>	<b>Exports</b>	<b>Imports</b>
Q1 1985–Q2 1997	1.97	1.52	7.40	8.41	7.06
Q1 1999–Q3 2006	2.58	4.32	7.92	7.95	9.10

Source: Economic Statistics System (ECOS), Bank of Korea.

Graph 9

**Growth trends of GDP and private consumption**

Percentage change, year-on-year



Source: Economic Statistics System (ECOS), Bank of Korea.

**Implications for monetary policy**

We have shown the causes and consequences of household debt. Among many other things, the increased volatility of consumption has important implications for macroeconomic stability. The next question is how monetary policy should respond to the instability caused by consumption volatility. To answer this question, we first construct a model and examine the effect of the increase in the number of hand-to-mouth households on each economic variable in response to a monetary policy shock. We then explore the monetary policy that can mitigate consumption volatility based on a central bank’s loss function.

To investigate the effect of the increase in the number of hand-to-mouth households, a counterfactual simulation is done based on the dynamic stochastic general equilibrium

(DSGE) model of Galí et al (2004). In this model, the household sector is divided into optimising households and hand-to-mouth households.

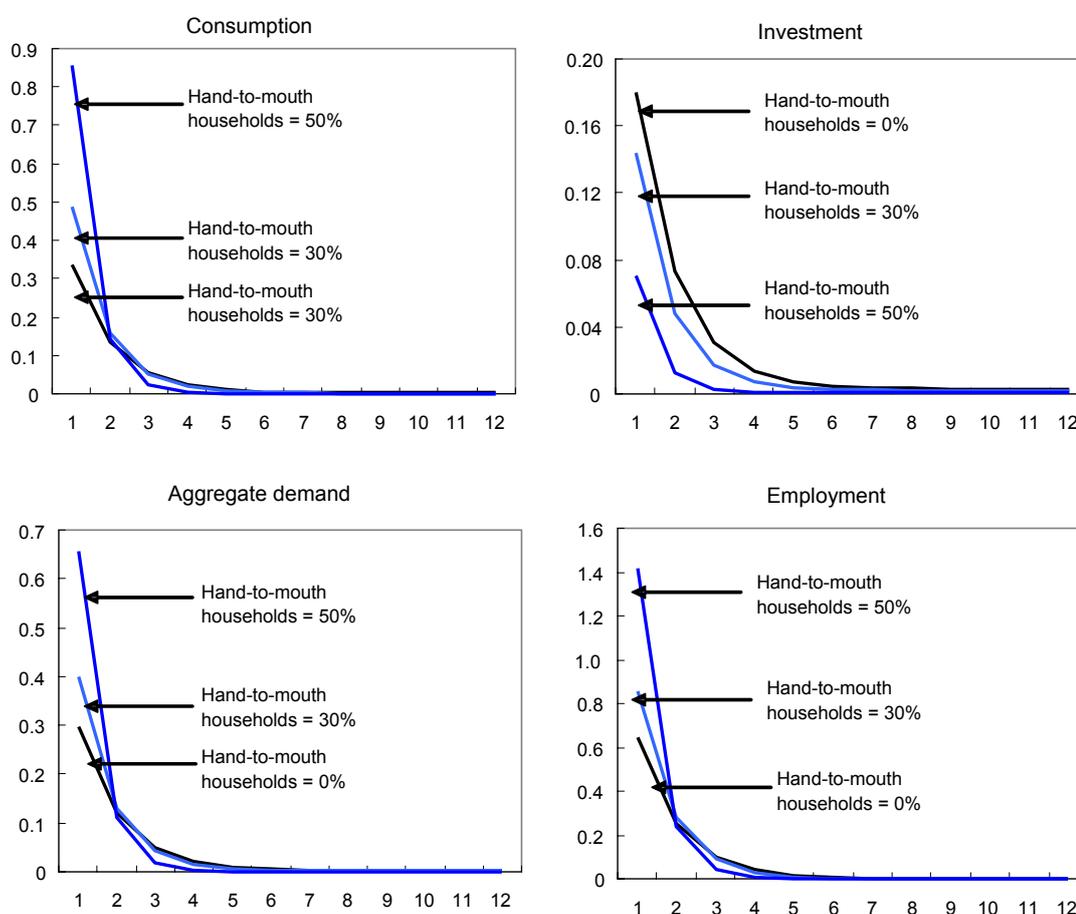
We conduct a simulation of the dynamic effects of a change in the call rate (the Bank of Korea policy rate), on the assumption that all households show optimising behaviour, using established parameter values. We then examine how the effects of monetary policy change when a major parameter value – the ratio ( $\lambda$ ) of hand-to-mouth households to total households – is altered, considering the changes in the monetary policy environment since the crisis.

The results are as follows. If a rate cut of 25 basis points occurs under the baseline model where hand-to-mouth households do not exist, total consumption increases by 0.32% in the first quarter. The scale of this increase gradually declines, and consumption generally returns to a steady state after the seventh or eighth quarter because of the effect running from interest rate cut  $\rightarrow$  reduction in savings  $\rightarrow$  increase in consumption. This result demonstrates that the effect of an interest rate cut is likely to persist for a longer time if only optimising households are considered. Next, the simulation shows that when the ratio ( $\lambda$ ) of hand-to-mouth households gradually rises ( $\lambda$  : 0%  $\rightarrow$  30%  $\rightarrow$  50%), a rate cut of 25 basis points leads to an increase in consumption growth in the first quarter (0.32%  $\rightarrow$  0.49%  $\rightarrow$  0.85%) in accordance with the rise in the ratio of hand-to-mouth households, whereas the duration of the response shrinks from seven–eight quarters ( $\lambda$  = 0%) to four quarters ( $\lambda$  = 50%) as shown in Graph 10.

Graph 10

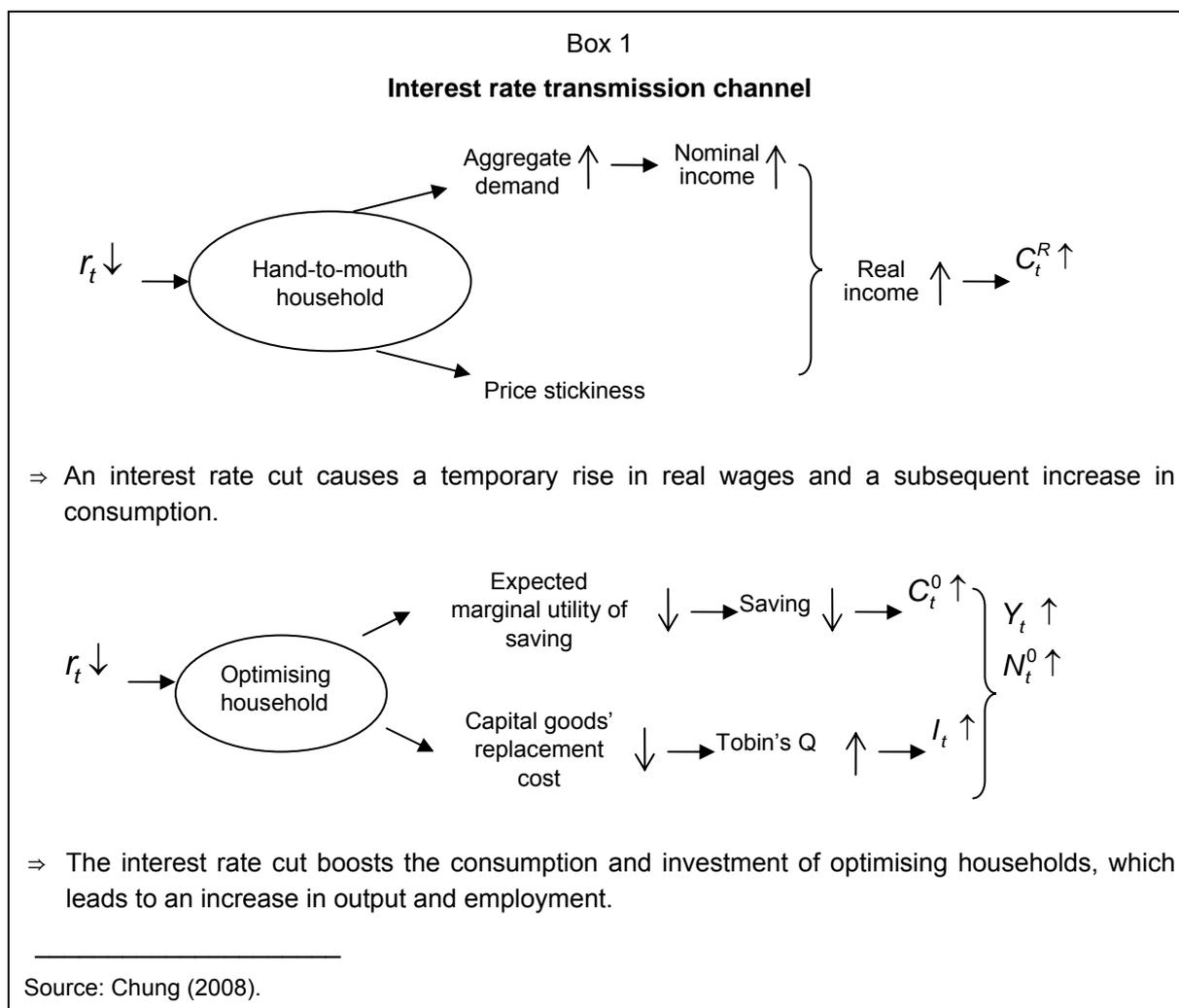
**Effect of ratio of hand-to-mouth households on interest rate cut of 25 basis points**

As a percentage of total households, by quarter



Source: Chung (2008).

This is attributable to the fact that the consumption of hand-to-mouth households expands initially due to the temporary increase of real wages after the interest rate cut under the sticky price model. In the case of optimising households, consumption increases due to the growth in real wages and reduction in savings, but the initial boost to consumption does not last long and quickly disappears as the ratio of optimising households that smooth consumption falls (Box 1).



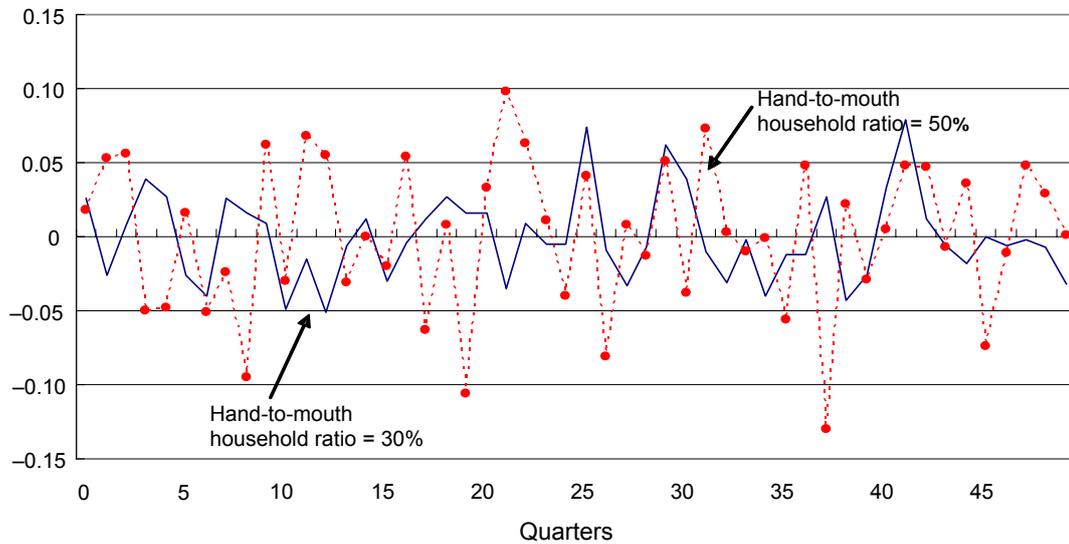
This gives us a clear explanation for the relationship between the ratio of hand-to-mouth households and consumption volatility: as the ratio of hand-to-mouth households decreases, the degree of consumption smoothing falls, which leads to greater consumption volatility.

In order to check this relationship from another perspective, we generate two consumption paths from the DSGE model changing the number of hand-to-mouth households and display them on the same graph. Graph 11 confirms that a higher number of hand-to-mouth households is associated with greater consumption volatility. It shows a comparison of consumption volatilities under two different ratios ( $\lambda$ ) of hand-to-mouth households – 30% and 50%. Consumption is much more volatile when  $\lambda = 50\%$  than when  $\lambda = 30\%$ . This result indicates that although an expansionary monetary policy boosts consumption initially, as the ratio of hand-to-mouth households increases, such a policy is likely to actually accentuate the business cycle as its effect disappears in a short time.

Graph 11

**Ratio of hand-to-mouth households and consumption volatility**

As a percentage of total households



Source: Chung (2008).

Table 3 indicates what the appropriate monetary policy would be in this situation. This table shows the loss function values by the coefficients of interest rate rules. The loss function is defined as the sum of the variances of inflation and output. In the interest of brevity, the target inflation is set at zero. A central bank may respond more strongly to inflation or to output according to its preference, but it is expected to choose the one with lower loss function values.

When the central bank increases (reduces) its response to the inflation and output gaps by twice (half) the coefficient in the estimated interest rate rule, the loss function value is smaller for the former than for the latter. This is due to the fact that when inflation is stabilised, real wages become stable, resulting in the moderation of consumption volatility. Since wages are the only source of income for the hand-to-mouth households, the stability of real wages is essential to the stability of consumption. Consequently, the central bank can alleviate the volatility of macroeconomic variables to a relatively greater degree by responding more actively to inflation than to output.

**Conclusion**

During the early 2000s, household debt in Korea increased rapidly due to low interest rates, rising house prices and the aggressive marketing of loans to households. Escalating household debt was one of the reasons there were large fluctuations in private consumption. This is why the central bank needs to conduct monetary policy properly in order to mitigate consumption volatility.

This paper demonstrates that given the current rapid decline in the household savings rate, the effectiveness of an expansionary monetary policy in boosting consumption is expected to be substantially constrained. Thus, to alleviate consumption volatility, it is more effective for the central bank to respond to inflation than to output.

Table 3  
Loss function value<sup>1</sup> by coefficient of interest rate rule

$\lambda$	0	0.1	0.2	0.3	0.4	0.5
$\hat{r}_t = 0.67\hat{r}_{t-1} + 0.5 \times 0.491\hat{\pi}_t + 0.106\hat{y}_t$ (inflation gap coefficient reduced by half)						
$L_t = \pi_t^2 + y_t^2$	0.024	0.025	0.029	0.035	0.041	0.063
$\hat{r}_t = 0.67\hat{r}_{t-1} + 0.491\hat{\pi}_t + 0.5 \times 0.106\hat{y}_t$ (output gap coefficient reduced by half)						
$L_t = \pi_t^2 + y_t^2$	0.025	0.026	0.033	0.037	0.042	0.064
$\hat{r}_t = 0.67\hat{r}_{t-1} + 0.491\hat{\pi}_t + 0.106\hat{y}_t$ (baseline model)						
$L_t = \pi_t^2 + y_t^2$	0.022	0.025	0.026	0.032	0.037	0.050
$\hat{r}_t = 0.67\hat{r}_{t-1} + 2 \times 0.491\hat{\pi}_t + 0.106\hat{y}_t$ (inflation gap coefficient doubled)						
$L_t = \pi_t^2 + y_t^2$	0.019	0.019	0.023	0.024	0.026	0.031
$\hat{r}_t = 0.67\hat{r}_{t-1} + 0.491\hat{\pi}_t + 2 \times 0.106\hat{y}_t$ (output gap coefficient doubled)						
$L_t = \pi_t^2 + y_t^2$	0.020	0.025	0.026	0.029	0.030	0.039

<sup>1</sup> Standard deviation.

Source: Chung (2008).

## References

Amato, J D and T Laubach (2003): "Rule-of-thumb behavior and monetary policy", *European Economic Review*, vol 47, no 5, October, pp 791–831.

Bank of Korea (2001–07): *Household credit trends*, [www.bok.or.kr](http://www.bok.or.kr).

——— (2001–07): *Monetary Policy Report*, [www.bok.or.kr](http://www.bok.or.kr).

Chung, K (2008): "Decrease in household savings rate and effectiveness of monetary policy", *The Bank of Korea Economic Papers*, no 89, 3 January.

Galí, J, J D López-Salido and J Vallés (2004): "Rule-of-thumb consumers and the design of interest rate rules", *Journal of Money, Credit, and Banking*, vol 36, no 4, August, pp 739–63.

Mankiw, N G (2000): "The savers-spenders theory of fiscal policy", *American Economic Review*, vol 90, no 2, May, pp 120–5.

Woodford, M (2003): *Interest and prices: foundations of a theory of monetary policy*, Princeton University Press.