

## Supply and Demand Factors of Stagnant Bank Lending in the U.S. and Europe: Comparison with Japan's Post-Bubble Period

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This paper studies supply and demand factors that explain the recent decline in bank lending growth in the U.S. and Europe. During 2008, bank lending growth in the U.S. and Europe declined while lending rates remained relatively constant. This phenomenon was also observed in Japan during the financial crisis in the late 1990s, suggesting a negative feedback loop between the real economy and the financial sector, where banks' lending supply and private sector's borrowing demand decrease simultaneously. On the other hand, U.S. and European banks' lending rates started to ease in early 2009, thanks to financial sector support programs and abundant liquidity from central banks, but the growth of lending continued to decelerate. This situation indicates that banks have tightened their credit standards to a smaller extent than in 2008 and that the current deceleration in bank lending is caused mainly by decreased demand for borrowing from the non-financial private sector, which still suffers from excessive indebtedness. The experience of Japan in the post-bubble period suggests a risk that U.S. and European bank lending will not effectively transmit desired effects of looser monetary policy as long as the non-financial private sector keeps downsizing its balance sheet. Moreover, U.S. and European banks may again tighten lending standards to a large extent and decrease their loan supply if the real economy re-enters a slump.

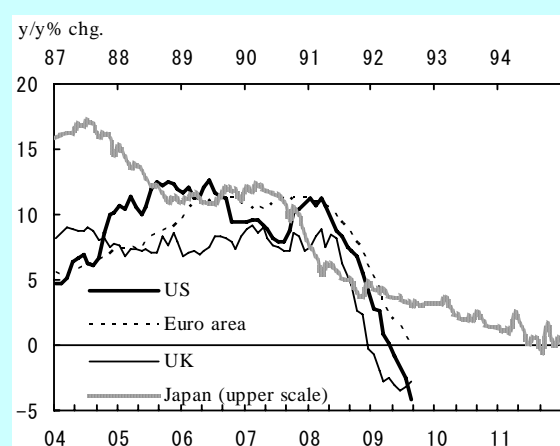
### I. Introduction

Bank lending growth in the U.S. and Europe has declined significantly since 2008. The growth rate in bank lending has fallen from its peak to the same extent as in Japan in the post-bubble period, and it turned negative in a shorter period from the peak out (Figure 1).<sup>1</sup> This paper analyzes supply and demand factors that influence this drastic decline in bank lending in the U.S. and Europe.

The implication obtained from this analysis is a key for economic outlook and macroeconomic policy. If a slowdown in bank lending is caused by a declining demand for borrowing by firms and households, which may be attributed to a fall in foreign demand and housing demand, the aim of macroeconomic policy should be to stimulate aggregate demand. On the other hand, if the slowdown is caused by banks' reducing lending to downsize their balance sheets, the economic downturn is likely to become more severe as a negative feedback loop between the financial sector

and the real economy intensifies. In the latter case, policymakers should consider not only expansionary aggregate demand policy but also

Figure 1: Loans to non-financial corporations and households



Note: The most recent data are as of Aug.09.

Sources: Bank of England (BOE), Bank of Japan (BOJ), European Central Bank (ECB) and the Federal Reserve Board (FRB).

financial sector support programs, including public capital injections and public purchase of non-performing loans, to improve banks' balance sheets.

This paper analyzes the relationship between the outstanding amount of bank lending and the bank lending rate – quantity and price in the lending market respectively – in the U.S. and Europe. We seek to isolate the factors that influence banks' loan supply and borrowers' loan demand in the context of recent developments. While analyzing the situation of the U.S. and the Europe, the paper also studies developments in bank lending in Japan from 1970s to 1990s. Since Japan has experienced the boom–bust cycle of the bubble economy in the second half of the 1980s and 1990s, Japan's experience provides useful insight into what is happening in the U.S. and Europe.

## II. Conceptual framework of the analysis

In the following analysis, the loan supply curve and the loan demand curve are the main tools for studying the causes of declines in lending. Figure 2 depicts banks' lending rate on the vertical axis and the volume of bank loans on the horizontal axis.

Figure 2: The conceptual framework of loan supply and demand curve analysis

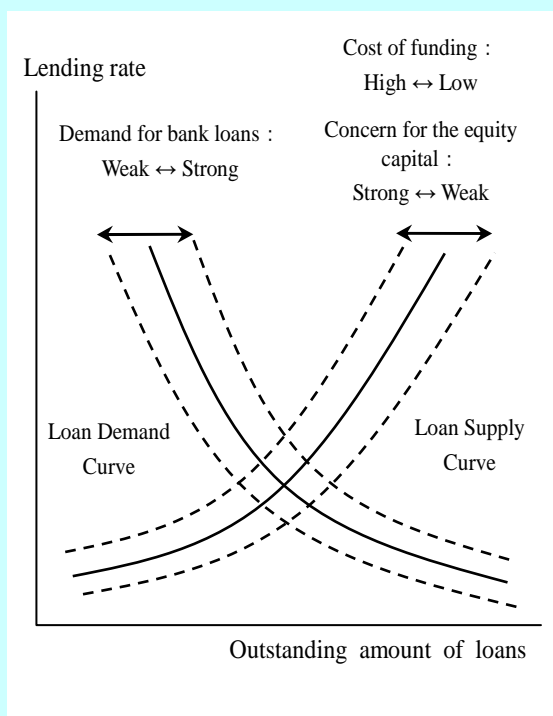
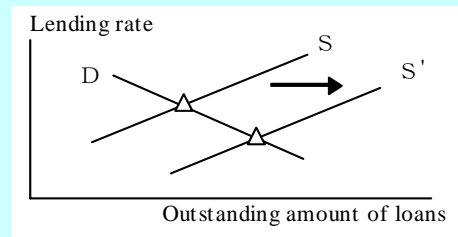
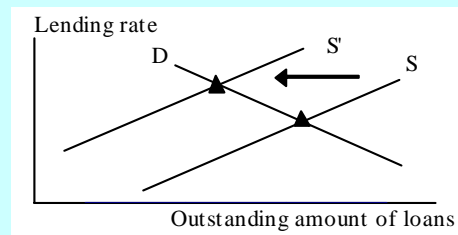


Figure 3: Identifying supply and demand factors

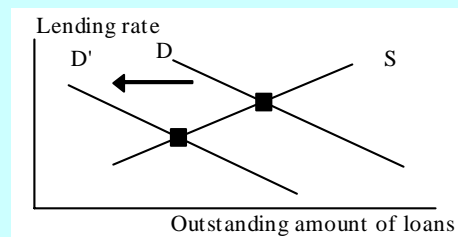
### Case 1: Increase in loan supply



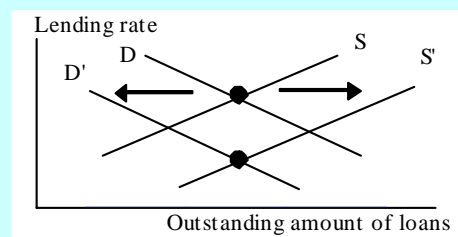
### Case 2: Decrease in loan supply



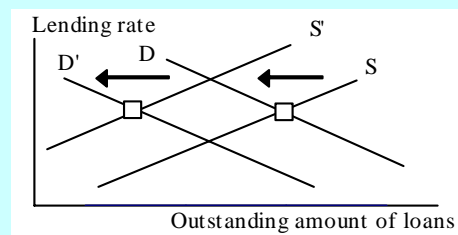
### Case 3: Decrease in loan demand



### Case 4: Increase in loan supply and decrease in loan demand occurring simultaneously



### Case 5: Decrease in loan supply and loan demand occurring simultaneously



The loan supply curve is upward-sloping, indicating banks' willingness to increase their loan supply as lending rates increase. Generally, banks' loan supply is affected by factors besides the lending rate, such as their cost of wholesale funding and the amount of capital buffer. When banks' cost of wholesale funding rises or when capital buffer decreases, the loan supply curve shifts horizontally leftward, since banks' incentive to increase loans will diminish at a given lending rate.

The loan demand curve is downward sloping, reflecting that demand for bank loans from households and non-financial firms decreases as lending rates rise. Households' and non-financial corporations' loan demand is also affected by other factors. For instance, exporters may increase capital investment to meet strong foreign demand, or households may anticipate rising asset prices and increase residential investment. In such instances, the loan demand curve shifts rightward.

Figure 3 shows how loan supply and demand factors are identified in this framework. Case 1 and 2 indicate the effects of shift of loan supply curve for lending rate and quantity of loans. For instance, when banks' wholesale funding cost declines as the central bank lowers the policy rate, the lending rate falls and the quantity of loans increases as the loan supply curve shifts rightward (Case 1,  $-\triangle-$ ). Conversely, when banks' wholesale funding cost rises as the central bank raises the policy rate, the lending rate rises and loan quantity decreases as the loan supply curve shifts leftward (Case 2,  $-\blacktriangle-$ ). Likewise, the effect of a shift in loan demand is depicted in Case 3. When loan demand by households and non-financial corporations decreases, the demand curve shifts leftward and, consequently, the lending rate falls and quantity of loans decreases ( $-\blacksquare-$ ). As is clear from comparing Case 2 and 3, whether the decline of loan growth is attributed to a supply or a demand factor can be distinguished by observing the change in lending rates.

### III. Japan's experience since the 1970s

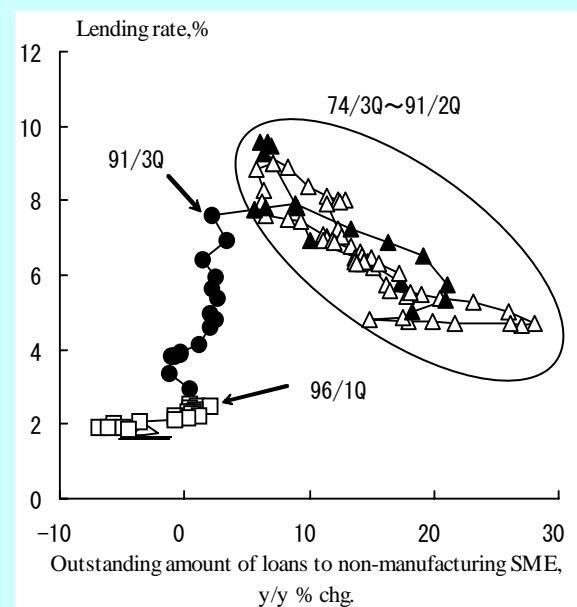
Let us start by observing developments in bank lending in Japan since the 1970s, which experienced a large credit cycle, that is, the emergence and burst of the bubble economy. The analysis provides insight into what has happened in recent U.S. and European lending markets and also helps to foresee their future developments. As

shown below, the business cycle-related behavior of bank lending to small and medium firms (SME), which often lack adequate access to capital markets, significantly changed following the collapse of the bubble economy in Japan.<sup>2</sup>

(Before the bubble burst: 1970s and 1980s)

In the 1970s and 1980s, lending by large banks, formerly called *Togin* (city banks), to small and medium firms tended to lead the business cycle in response to monetary policy. The bank lending rate and the four-quarter growth rate of city banks' lending to small and medium non-manufacturing firms had exhibited negative relationship until the 1980s (Figure 4,  $-\blacktriangle-$  and  $-\triangle-$ ). This relationship can be interpreted as the result of shifts of the loan supply curve along the loan demand curve. That is, the supply curve shifts rightward in response to Bank of Japan's loosening monetary policy and conversely shifts leftward in response to tightening monetary policy (Figure 3, Case 1 and Case 2). It shows that the loan supply factor played the dominant role in determining the quantity of bank lending in the 1970s and 1980s.

Figure 4: Japanese large bank lending to non-manufacturing SME



Source: BOJ.

This observation suggests that bank lending was one of the central transmission mechanisms of monetary policy. City banks were eager to expand their profit bases by increasing lending. Therefore, when the Bank of Japan eased monetary policy and

banks' profit margin increased, they sought to increase lending to small and medium firms, which showed more stable borrowing demand than large enterprises. Small and medium firms benefited from loan offers because they lacked sufficient access to capital markets and had incentive to invest under the expectation of good macroeconomic performance.

(After the bubble burst: the first half of the 1990s)

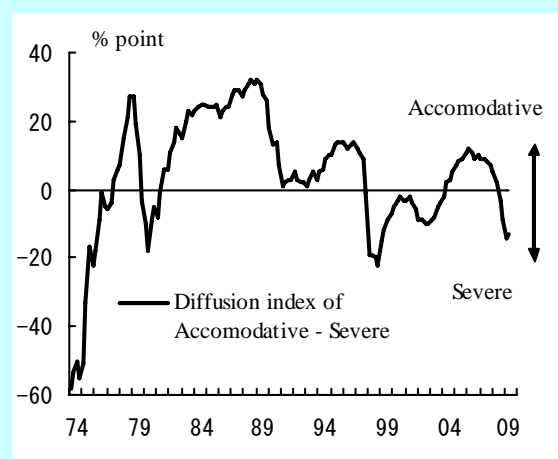
The characteristic of bank lending changed dramatically in Japan's post-bubble period. The negative relationship between the bank lending rate and loan growth disappeared. In the first half of the 1990s, the bank lending rate fell with little change in the growth rate of lending. Correspondingly, the relationship at that time is plotted around a steep right-upward sloping curve (Figure 4, —●—). This phenomenon is observed when the loan supply curve shifts rightward in response to monetary easing and simultaneously the loan demand curve shifts leftward (Figure 3, Case 4). The leftward shift of the loan demand curve, which may have been larger than the rightward shift of the loan supply curve, reflected firms' reduced incentive to invest in response to their excessive capital stock, lower expected growth, and excessive debt. On the other hand, looser monetary policy stimulated lending, albeit less than what it was in the 1970s and 1980s because the value of loan collateral fell with property prices and also because profitable lending to firms with excessive capital stock and debt seemed less likely. Therefore, looser monetary policy was less effective.

(After the bubble burst: since the second half of the 1990s)

In the second half of the 1990s, the quantity of outstanding bank loans began to decline while lending rate stopped falling. Correspondingly, the relationship between lending growth and the lending rate at that time is characterized by a horizontal line instead of the vertical line observed during the first half of the 1990s (Figure 4, —□—). This phenomenon occurs when the loan supply curve and the loan demand curve simultaneously shift leftward (Figure 3, Case 5).<sup>3</sup> In 1997, the momentum of economic recovery weakened, reflecting a large fall in exports due to Asian currency crisis. Given the weakened real economic activities, the bankruptcy of large banks

triggered a financial crisis in Japan. Banks reduced lending because wholesale funding in the inter-bank money market was difficult and their core capital was eroded by decline in stock prices and by increase in non-performing loans. These circumstances induced the negative feedback loop between the financial sector and the real economy, and loan demand fell. This interpretation is supported by the TANKAN survey of small and medium firms' view of banks' attitude toward lending, which deteriorated to levels resembling the oil shock in the 1970s and remained stagnant until the 2000s (Figure 5).

Figure 5: Lending attitude of financial institutions judged by SME



Source: BOJ, "TANKAN;"

#### IV. Experience of the U.S. and Europe in the 2000s

Next, we study whether the characteristics of U.S. and European bank lending markets also have changed in the 2008 financial crisis and whether their current situations resemble the situation in Japan in the post-bubble period (Figure 6).

(The recession in the first half of the 2000s)

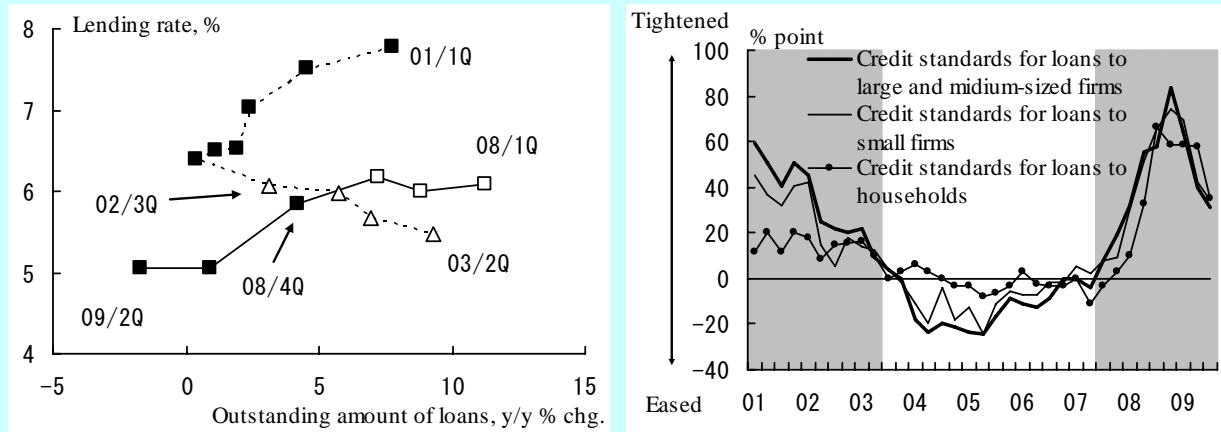
To examine what has happened in the U.S. and Europe during the ongoing crisis, it is useful to review developments in lending markets after the collapse of the information-technology bubble. In the U.S., growth in bank lending fell until the first half of 2002 (--■--), then started to rise (--△--). The lending rate decreased throughout the period. These observations suggest that initially the leftward shift of the loan demand curve was a dominant factor, due to the economic downturn induced by the collapse of the

information-technology bubble (Figure 3, Case 3). After that, a fall in funding costs stimulated banks to expand lending, reflected in the rightward shift of the loan supply curve (Figure 3, Case 1). In other

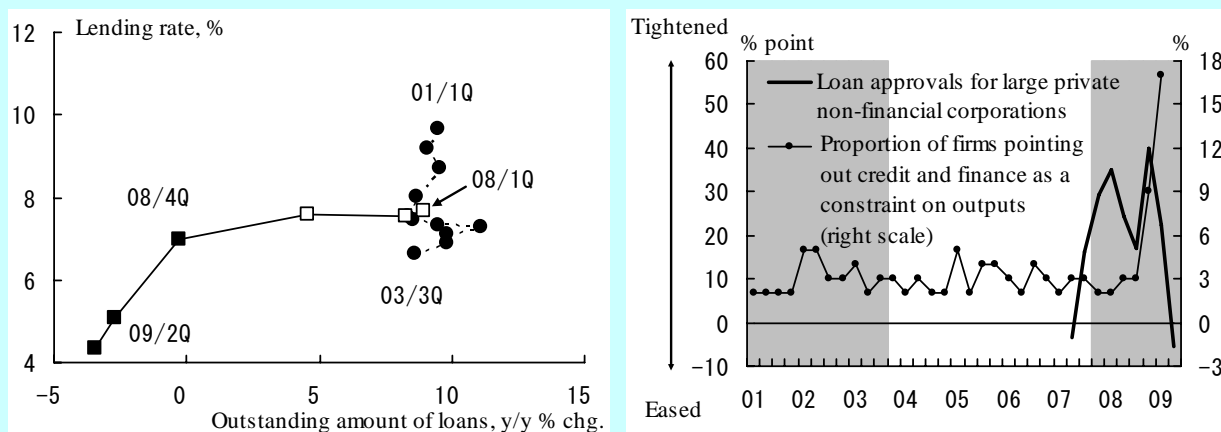
words, the effects of loosening monetary policy prevailed via the bank lending channel with a lag. Correspondingly, the loan officers' survey shows that credit conditions eased gradually from 2002.

Figure 6: Bank lending in the U.S. and major European countries

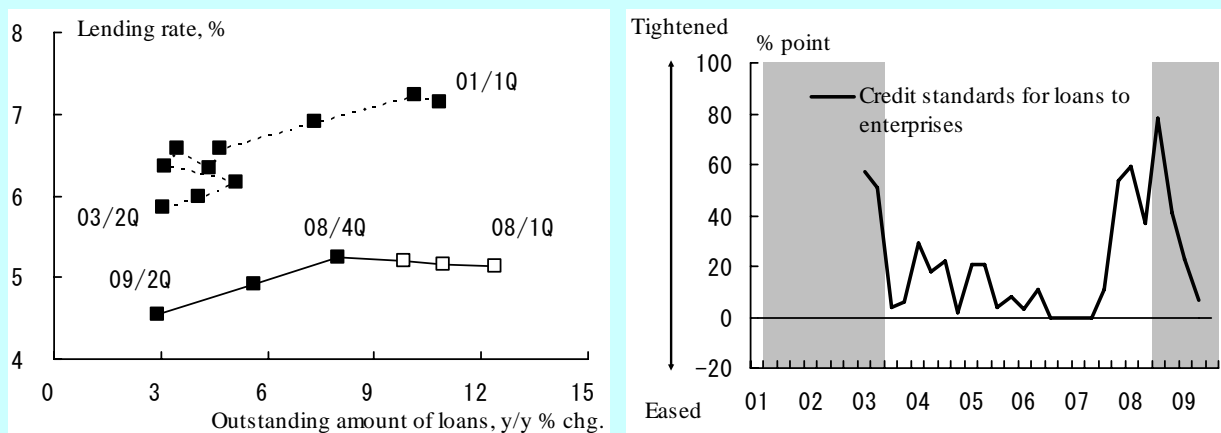
#### U.S.



#### U.K.



#### France



Note1: Lending rates are stock base in principle.

Note2: Shaded areas indicate monetary easing periods.

Note3: Lending attitude for households in the U.S. is measured by survey of banks' lending attitude for credit card loans.

Sources: BOE, Banqu de France, CBI, ECB, FRB, and Mortgage Bankers Association (MBA).



The U.K. bank lending rate also fell in the same period, although the growth rate of bank lending stayed almost constant (--●--). This situation reflected the leftward shift of the loan demand curve because of the economic downturn and the rightward shift of the loan supply curve due to monetary easing (Figure 3, Case 4).

In summary, loosening of monetary policy in the U.S. and the U.K. in the first half of the 2000s led to an increase in lending that gave momentum to economic recovery. This situation resembles the situation in Japan until the first half of the 1990s.

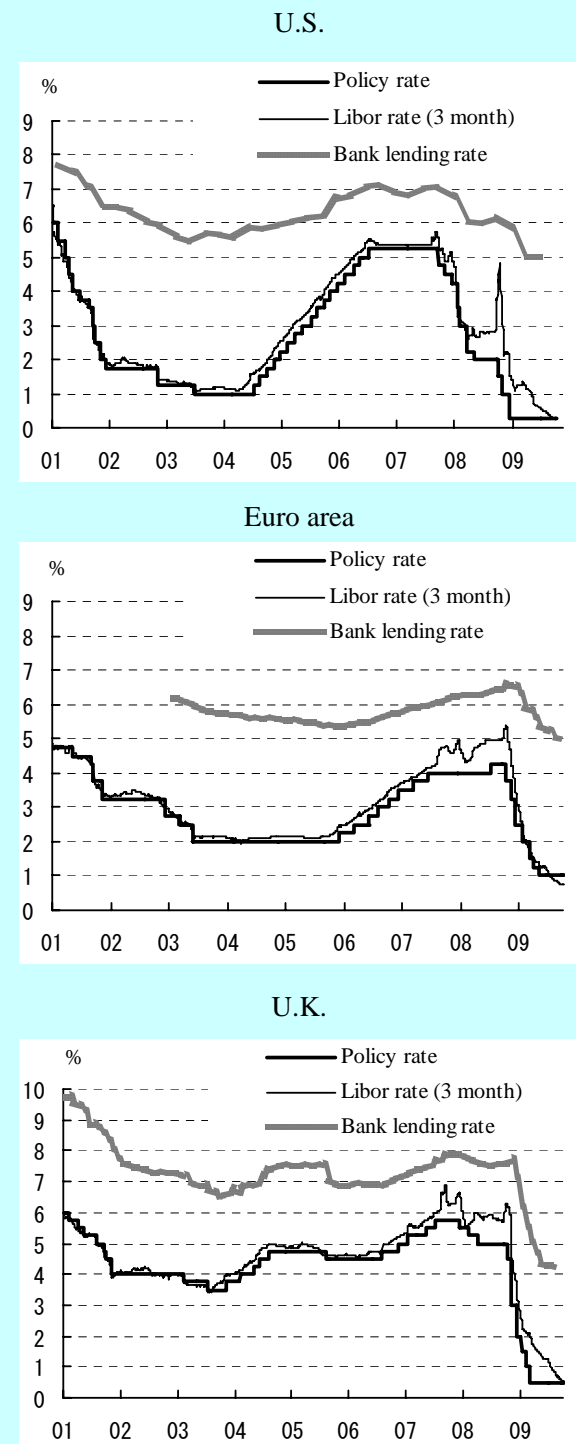
(The 2008 financial crisis)

Unlike the last recession, the bank lending channel after the 2008 financial crisis hasn't worked effectively yet as the transmission mechanism for monetary policy. During 2008, bank lending in the U.S., the U.K., and Europe decelerated with little change in the lending rate (—□—). This phenomenon was also observed in Japan in the second half of the 1990s and implies the simultaneous leftward shift of both the loan supply curve and the loan demand curve (Figure 3, Case 5). In other words, it is likely that the negative feedback loop between the financial sector and the real economy materialized. This view is also supported by survey data, which suggest that banks' restrictive attitude toward lending and difficulty in firms' liquidity management exceeded levels of the recession after the information-technology bubble.<sup>4</sup> Banks' funding rate in the inter-bank money market, which stayed high because of deterioration in the market's functioning, also attenuated the effects of looser monetary policy.

In 2009, however, the lending rate began to decline following the lending growth rate in all three countries (—■—). This phenomenon can be interpreted as a result of the leftward shift of the loan demand curve along the loan supply curve, or the extent of the leftward shift of the loan supply curve becoming smaller than that of the loan demand curve. This observation suggests not only that debt-laden households and firms with excessive capital stock continue to reduce borrowing, but also that banks have reduced lending to a smaller extent than in 2008 in response to government's financial sector support programs. Survey data support this interpretation by indicating that banks' lending

standards are still tightening, but at a slower pace.<sup>5</sup> A decline in the banks' funding rate in the inter-bank money market, reflecting the calming of the liquidity crisis, also limits the leftward shift of the loan supply curve (Figure 7).

Figure 7: Policy rates and bank lending rates



Note: The most recent data of lending rate are as of 09/2Q for the U.S., Aug.09 for Euro area, and Jul.09 for the U.K.. The most recent data of policy rates and Libor rates are as of Sep.09 for all countries and the region.

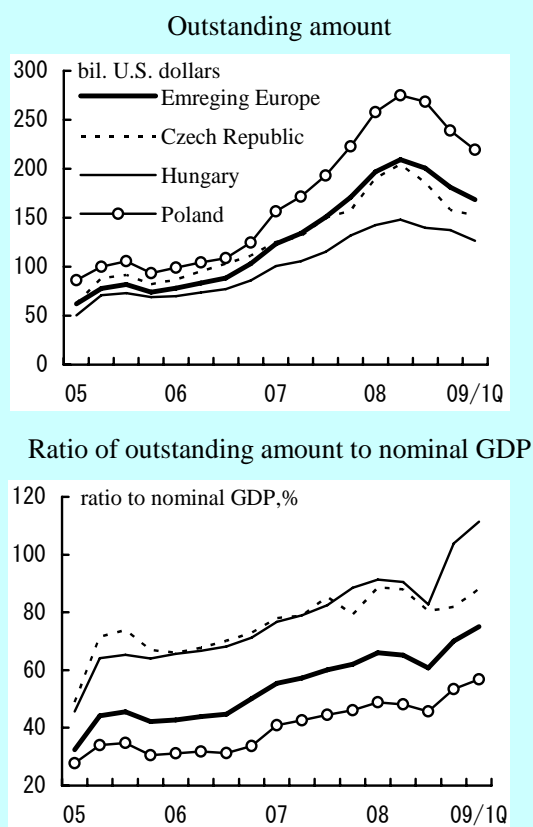
Sources: BOE, ECB, FRB and MBA.

These observations suggest that the negative effects of reduced loan supply have diminished recently. However positive results of looser monetary policy via bank lending have not yet appeared. This may be because banks are improving the quality and reducing the size of their balance sheets, partly by reducing poorly-performing loans to households and non-financial firms with excessive debt. In short, the bank lending markets in the U.S. and Europe have faced the same problem prevalent in post-bubble Japan.

## V. Emerging Europe

Before the recent financial crisis, large amount of capital flowed into emerging Europe mainly from developed European countries attracted by high interest rates reflecting its economic growth potential. At the outbreak of the financial crisis, however, capital inflows reversed, and European banks' lending to emerging Europe declined (Figure 8). Conditions in emerging European countries' lending markets are strongly

Figure 8: European banks' lending to emerging Europe

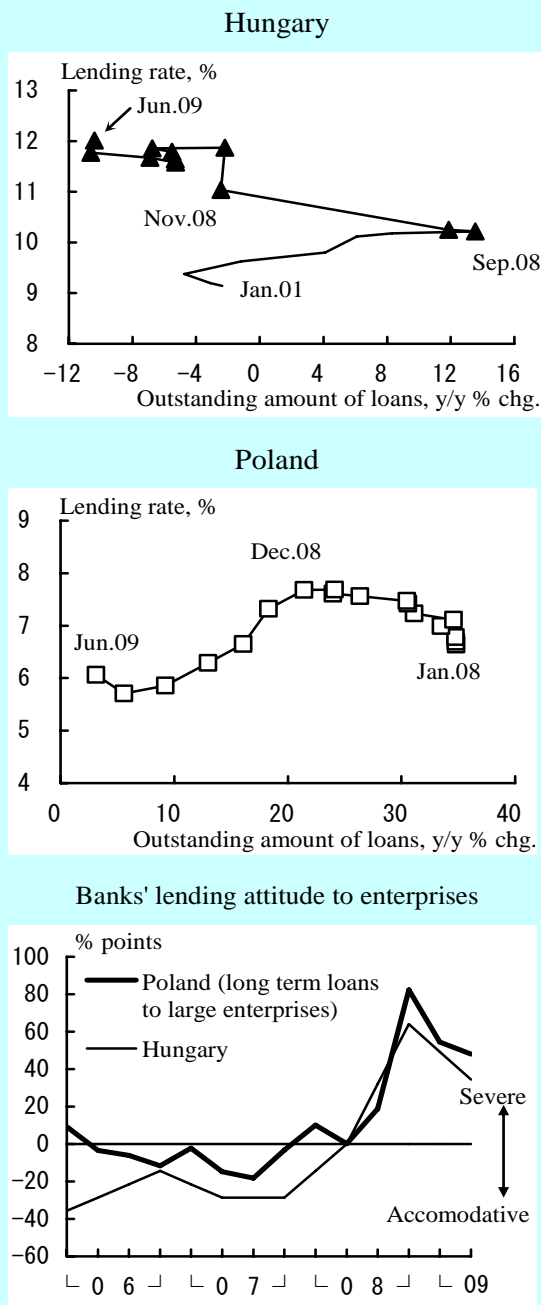


Note: Data for Emerging European countries are calculated as the weighted average of data for Bulgaria, Czech Republic, Hungary, Poland and Romania.  
Sources: Bank for International Settlements and CEIC.

influenced by credit standards of banks in developed European countries, which have acquired many domestic financial institutions in emerging European countries. This section examines lending markets in two emerging European countries, Hungary and Poland.

Since the third quarter of 2008, the outstanding amount of bank loans decreased in Hungary while the lending rate kept rising (Figure 9, —▲—). This situation implies that the loan

Figure 9: Bank lending in Emerging Europe



Note: The data for home currency denominated loans are used.  
Sources: Central Bank of Hungary and National Bank of Poland.

supply curve shifted leftward more than the loan demand curve as the economic downturn worsened. The leftward shift of loan supply curve is attributed to significant credit tightening by European banks in addition to the rate hike of the Central Bank of Hungary intending to prevent the currency depreciation. Also in Poland, the leftward shifts of both the loan supply curve and the loan demand curve, reflecting banks' tightening credit standards and economic downturn, are observed. Since the beginning of 2008, loan growth has declined sharply in Poland while the bank lending rate has hovered around 7 percent (Figure 9, —□—).<sup>6</sup> The bank lending surveys suggest that banks are tightening credit standards in these two countries.<sup>7</sup>

As indicated by the fact that lending rates have not declined yet, banks' tight credit standards still affect loan growth for emerging Europe. Moreover, households and firms in emerging European countries increased their foreign-currency-denominated debt before the crisis. Depreciation in their currencies inflated the amount of debt in terms of local currencies and has suppressed domestic demand in the private sector struggling to repay the inflated debt. As a result, aggregate expenditure and income fell dramatically in most emerging European countries and the leverage ratios (the ratio of outstanding debt to GDP) are still rising despite the reduction in the level of outstanding debt.

Emerging Europe is an important market for exporters in developed European countries. Tight credit standards in emerging Europe influenced by banks in developed European countries prolong stagnant economic situation and reduce the growth of export from their own economies. In such vicious cycle, non-performing loans in both emerging and developed European countries increase and banks do not loosen their credit standards. In other words, the negative feedback loop between financial sectors and real economies works not only within countries but also across borders.

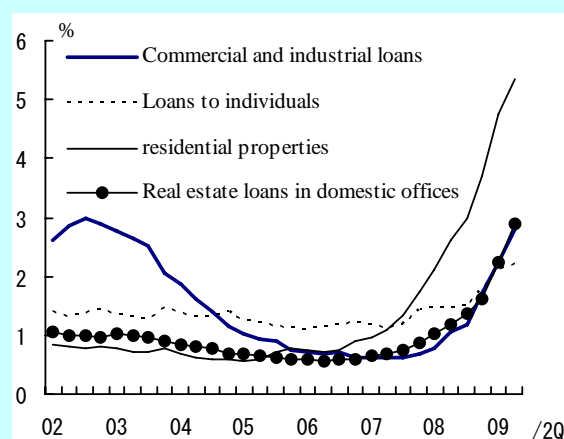
## VI. Concluding remarks

In the U.S. and developed European countries, tight lending standards and declining demand for loans led by the economic slump depressed bank lending during 2008. In 2009, the effects of financial sector support programs and ample

liquidity injections by central banks are moderating the reduction in bank lending. However, the positive effect of expansionary monetary policy via the bank lending channel has not yet been observed.

The momentum toward economic recovery in the U.S. and developed European countries is expected to continue. However, uncertainty regarding banks' financial positions remains, particularly as related to non-performing loans (Figure 10). Further negative shocks may induce banks to tighten lending standards to a large extent again, which implies the large leftward shift of loan supply curve. Hence, recurrence of the negative feedback loop between the financial sector and the real economy remains a risk. In developing European countries, banks' lending standards remain tight, and their real economies remain under pressure. Prospects of a prolonged economic slump are a concern.

Figure 10: Non-performing loan ratio of the U.S.



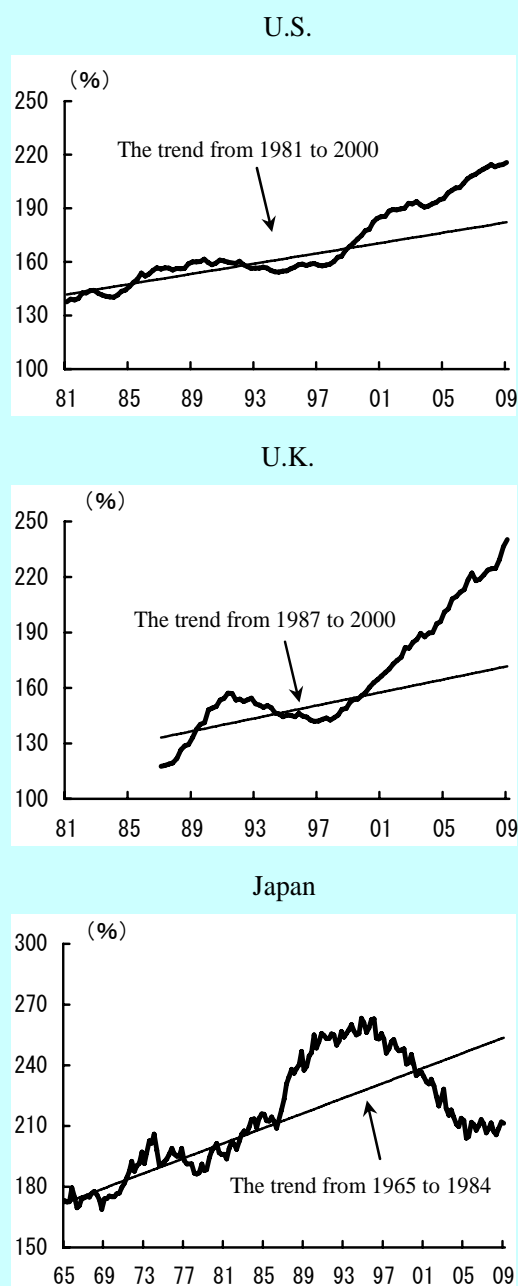
Source: Federal Deposit Insurance Corporation.

Japan's experience after the burst of its bubble economy may be instructive for the U.S. and Europe. Specifically, Japan's experience suggests that bank lending is not a fully effective channel for expansionary monetary policy as long as balance sheets in the non-financial private sector remain too large. That is the present situation in the U.S. and the U.K., where leverage ratios (the ratio of non-financial private sector's debt outstanding to nominal GDP) stand far above linear trends extrapolated from the 20-year period before the monetary loosening that led to bubble economy (Figure 11). The differences between the trend and current levels are profound; the required degree of balance sheet reduction may exceed post-bubble



Japan. It is likely that the sustainability and autonomy of Japan's economy in the recovery phase in the business cycle decreased due to the reduced effectiveness of monetary policy for domestic demand after the balance sheet adjustment experience. As a result, Japan's economy seems to be more dependent on external factors such as foreign demand. Japan's experience should be kept in mind when examining current developments in the world economy.

Figure 11: Leverage ratio of major advanced countries



Note: Leverage ratio = outstanding amount of private non-financial sector debt / nominal GDP. Shares and other equities are excluded from the outstanding amount of debt.

Sources: U.S. Bureau of Economic Analysis, BOJ, Cabinet Office of Japanese government, FRB, and Office for National Statistics.

<sup>1</sup> Year over year growth rates of loans described in Figure 1 exclude loans to financial institutions. As for the U.S. loan data, the influence of mergers among commercial banks is also excluded. For the U.K. loan data, the influence of statistical definition change of banks' and building societies' own covered bond entities in M4 lending is also excluded. In the U.K., the covered bond entities were previously treated as other financial corporations. From April 2009, they are treated as part of the bank or building society.

<sup>2</sup> The result of analysis for Japan in the pre-financial crisis period provided in this Review is mainly based on Hiroshima, T., 1997, "Banks' Lending to SME and the Real Economy," Bank of Japan / Research and Statistics Department Working Paper Series, 1997-4.

<sup>3</sup> The simultaneous leftward shifts of loan supply and demand curves are not the only hypotheses that might bring such relationship of lending rate and outstanding amount of loans, which is plotted at a horizontal line. For instance, loan supply curve is expected to flatten when lending rate touches the floor rate. Credit rationing of banks can also reduce loan supply without changing the lending rate. When the creditworthiness of borrowers is at a level of grave concern to the banks, they avoid supplying additional amount of credits even with a higher lending rate. As a result, lending rate would be maintained at a lower level than the rate of equilibrium of loan supply and demand curves.

<sup>4</sup> Privately held firms, which rely heavily on credits from banks, are likely to face reduced credit-line availability when the credit market tightens. See James, C. M., "Credit Market Conditions and the Use of Bank Lines of Credit," FRBSF Economic Letter, 2009-27.

<sup>5</sup> Capital injection started from October 2008 in the U.S. and the U.K., and from December 2008 in France.

<sup>6</sup> Large amount of monetary loosening by National Bank of Poland contributed to the fall of bank lending rate from the end of 2008 to April 2009.

<sup>7</sup> Although Figure 9 only describes the growth of loans to corporate sector, a decline in loan growth and a rise in lending rate are also observed in the loan for household sector. Survey data also suggest that banks have adopted a stringent attitude towards household lending.

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