

## ARTICLES

# MONEY AND CREDIT GROWTH AFTER ECONOMIC AND FINANCIAL CRISES – A HISTORICAL GLOBAL PERSPECTIVE



*Patterns in average money and credit growth around the time of past economic and financial crises represent a useful benchmark for the assessment of current and future developments in money, credit and output. This is especially true if a distinction is made between different types of recession, namely those which coincided with a financial crisis and those which did not. This article derives historical benchmarks for those types of recession and compares those stylised patterns with euro area data for recent years. Recent developments in euro area money and credit appear to be broadly in line with general patterns observed during recessions and recoveries in OECD economies since 1960 if the recent economic slowdown is compared with recessions accompanied by systemic banking crises. For example, broad money growth, narrow money growth and domestic credit growth typically diverge during such periods, with M1 growth typically leading the turnaround in the business cycle, broad money growth moving in line with the economic cycle (albeit being less pronounced during the downturn), and credit growth generally lagging behind the recovery in economic activity. Looking ahead, it is impossible to rule out some intensification in the interplay between euro area monetary and credit aggregates (with the potential for output to deviate from historical averages as a result), mainly owing to the simultaneous presence of various factors. The latter may be associated with: i) the unusually high levels of private and public sector indebtedness observed in recent years; ii) the interplay between the sovereign debt crisis, investors' concerns and pressure on banks' funding and capital in various European countries; and iii) the more pronounced manner in which the crisis has spread internationally.*

### I INTRODUCTION

The ECB regularly monitors monetary aggregates in order to gauge inflationary pressures in the medium to longer term within the context of the monetary pillar. For this purpose, it is useful to assess the various components and counterparts of monetary aggregates on the basis of their degree of persistence (with low-frequency and business cycle-frequency components potentially being of use here), as the role played by money in the economy varies according to a number of factors, including the stage of the business cycle. Thus, analysing patterns in broad money and its components and counterparts during a specific phase of the business cycle – i.e. a recession – can help us to understand the signals imparted by monetary developments. Such analysis not only provides insight into future developments in money growth, but also enables an assessment both of the extent to which current and future developments in monetary aggregates are likely to be temporary and of the corresponding impact on output and inflation.<sup>1</sup> Against this background, this article reviews recent developments in euro area broad money, its main component (i.e. narrow money) and its main counterpart (i.e. domestic credit), comparing these with

developments in a number of OECD countries around the time of a series of recessions since 1960.<sup>2</sup> Recent developments are compared with the general patterns observed both during and after previous recessions, and there is a specific focus on recessions which coincide with a systemic banking crisis, as these may well be the best point of reference as regards the recent crisis.

The recession experienced by the euro area and several other advanced economies in 2008 and 2009 was the most severe for several decades. In the euro area, it was the deepest recession since at least 1960 – with synthetic annual euro area aggregates with sufficient coverage unable to be constructed for periods prior to this date – and possibly even since the Great Depression (see Chart 1).<sup>3</sup> This economic downturn

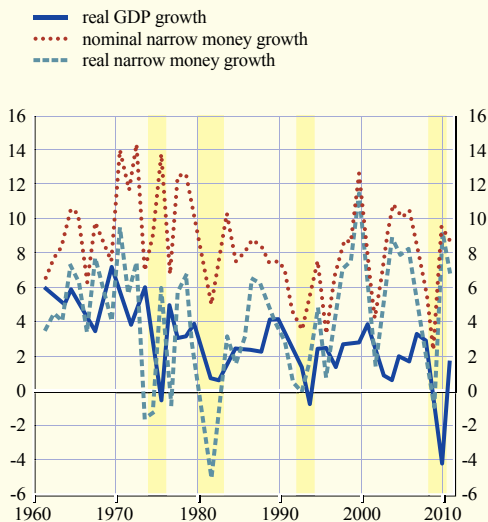
1 For further details on various aspects of the monetary analysis carried out by the ECB, see Papademos, L. and Stark, J. (eds.), *Enhancing monetary analysis*, ECB, 2010.

2 This article is based on data available for the period up to 15 January 2012.

3 For the period from 1995 to 2010, annual data on real euro area GDP are based on data from Eurostat (ESA 95). For the period from 1960 to 1994, Eurostat data are extended backwards using data from the European Commission (AMECO database). These series are euro area aggregates for the 12 countries comprising the euro area in 2002 (the largest euro area aggregate for which historical data for the entire period since 1960 can be found in official databases).

**Chart 1 Euro area real GDP and narrow money growth**

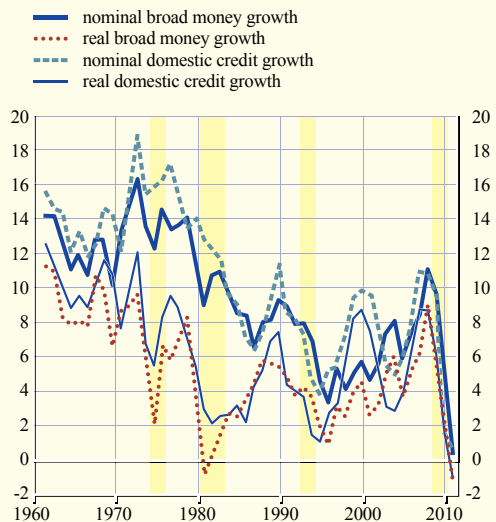
(annual percentage changes)



Sources: ECB, European Commission and ECB calculations.  
Note: Shaded areas denote euro area recessions as defined by the Euro Area Business Cycle Dating Committee of the Centre for Economic Policy Research.

**Chart 2 Euro area broad money and domestic credit growth**

(annual percentage changes)



Sources: ECB, European Commission and ECB calculations.  
Note: Shaded areas denote euro area recessions as defined by the Euro Area Business Cycle Dating Committee of the Centre for Economic Policy Research.

coincided with widespread tensions in financial markets and was linked to difficulties in the banking sector, the bursting of asset price bubbles and a slowdown in credit growth both in a considerable number of euro area countries and in several other advanced economies. The economic and financial crisis significantly affected the growth of money and credit. In 2010, for example, euro area broad money growth and domestic credit growth were the weakest they had been since at least 1960 in both real and nominal terms (see Chart 2).<sup>4</sup> Both in nominal and in real terms, narrow money growth declined markedly in 2008, before recovering, thereby confirming its leading indicator properties as regards turning points in real GDP growth. Similar developments were observed for several other advanced economies.

Despite the fact that the recent economic and financial crisis was, in some respects, unprecedented in the period since the Second World War, it is still possible to learn lessons by comparing those developments with other

recessions and financial crises in advanced economies over the past five decades. Indeed, the general patterns observed in past episodes sharing some similarities with the recent crisis may prove a useful point of reference as regards assessing the current behaviour of money and credit and gaining insight into their future development. Needless to say, every crisis has unique characteristics, something that should be borne in mind in order to avoid mechanically applying historical patterns to the current situation. Furthermore, it is important not only to assess historical regularities and any related uncertainty, but also to examine any factors which may imply deviations from these general patterns.

4 For the period from 1980 to 2010, annual data on euro area monetary and credit aggregates and consumer prices (which are used to deflate money and credit series) are based on data from the ECB. For the period from 1960 to 1979, ECB data are extended backwards using data from the European Commission (AMECO database). These series are euro area aggregates for the 12 countries comprising the euro area in 2002 (the largest euro area aggregate for which historical data for the entire period since 1960 can be found in official databases).

This article is organised as follows. Section 2 provides an overview of general developments in the growth of broad money, narrow money and domestic credit around the time of recessions in OECD countries from 1960 to 2010, with a specific focus on certain types of recession. Since this concerns short to medium-term developments in output, the main focus will be on monetary and credit aggregates expressed in real terms. Section 3 then discusses the main factors which can explain the various patterns observed in money and credit growth around the time of recessions. This section also highlights the specific factors that may potentially result in euro area money and credit growth deviating from historical averages. On the basis of the analysis presented, some broad conclusions are drawn in respect of any future recovery in euro area money and credit growth.

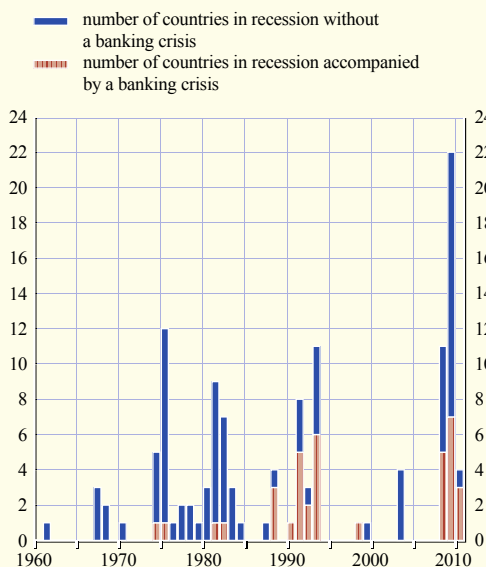
## 2 PATTERNS IN MONEY AND CREDIT GROWTH AROUND THE TIME OF CRISIS PERIODS

Recessions are a recurrent phenomenon in all advanced economies. This can be seen, for example, by applying a simple rule of thumb whereby recessions are defined as periods of one or more years of negative annual real GDP growth. This does not capture all recessions as they are typically defined, capturing only the more severe episodes. However, even using such a definition, countries with advanced economies for which historical data are available (in this case, 12 euro area countries and 11 other OECD countries) experienced 87 recessions between 1960 and 2010 (see Chart 3).<sup>5</sup> Those 87 recessions had an average duration of 1.4 years, which corresponds to an 11% probability of a country experiencing a recession in any given year.

Financial crises were also far from rare in that period. For example, according to a widely used chronology of banking crises,<sup>6</sup> the 23 OECD countries considered experienced 24 banking crises (i.e. periods of one or more years of banking crisis), which lasted four

Chart 3 Recessions and banking crises in OECD countries, 1960-2010

(number of countries)



Sources: ECB, European Commission and ECB calculations.  
Notes: 23 OECD countries are considered: 12 euro area countries and 11 other OECD countries (see footnote 5). For definitions of recessions and banking crises, see the main text and footnote 8.

years on average, implying a probability of around 8% of a country experiencing a banking crisis in any given year. In the sample under consideration, 23 episodes were characterised by both a recession and a banking crisis (i.e. with the banking crisis occurring either in the same year as the recession or in the years directly preceding or following it). According to the data, the time periods featuring widespread recessions and recessions accompanied by banking crises are the mid-1970s, the early 1980s, the early 1990s and the period from 2008 to 2010.

5 The following euro area countries are considered: Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal and Spain. The other OECD countries considered are: Australia, Canada, Denmark, Iceland, Japan, New Zealand, Norway, Sweden, Switzerland, the United Kingdom and the United States.

6 See Reinhart, C. and Rogoff, K., *This time is different. Eight centuries of financial folly*, Princeton University Press, Princeton, 2009 (particularly Data Appendix A.3).

## AVERAGE BROAD MONEY GROWTH AROUND THE TIME OF CRISIS PERIODS

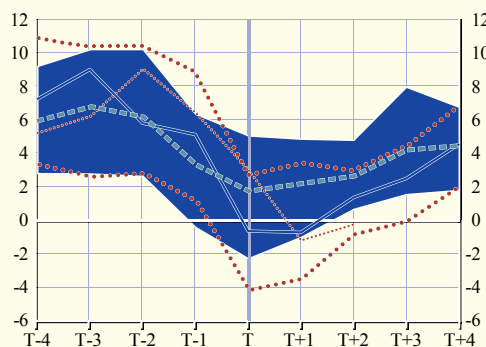
Broad money<sup>7</sup> growth tends to be a good leading indicator of consumer price inflation in the medium to longer term. However, business cycle-related developments in real broad money growth are also linked to real GDP growth. Indeed, at those frequencies, money demand is also influenced by portfolio considerations related to developments in economic activity. Experience in advanced economies over the past five decades suggests that, on average, real broad money growth tends to decline around recession periods in line with real GDP growth (albeit less markedly and remaining in positive territory; see Chart 4). Moreover, troughs in real broad money growth tend to coincide with those in real GDP growth, and recoveries in money growth following recessions tend to take place at a relatively moderate pace. The fact that real broad money growth moves in line with – but declines less strongly than – real GDP growth during recessions may reflect various factors, such as:

i) portfolio shifts towards more liquid and less risky instruments, with the aim of reducing portfolio risk or for precautionary purposes; and ii) the need to compensate for declines in disposable income growth and smooth consumption expenditure by reducing the amount of savings allocated to long-term financial investments. In the upswing, portfolio shifts into more risky assets might explain why broad money growth does not recover as strongly as output. The variability of real broad money growth tends to be significant around the time of recessions, as exemplified by the average difference of 6 percentage points between the upper and lower quartiles. Recent developments in euro area real M3 growth appear similar to those observed, on average, in previous recessions – albeit with growth continuing to decline in 2010, despite the recession having ended. Having said that, a delayed recovery of this kind appears typical of recessions accompanied by a banking crisis.<sup>8</sup> Accordingly, the slight recovery observed in euro area real broad money growth in 2011 was also broadly in line with previous recessions featuring a banking crisis.

**Chart 4 Average real broad money growth around the time of recessions and banking crises**

(annual percentage changes; percentage points)

- interquartile range for all recessions
- interquartile range for recessions featuring a banking crisis
- average for all recessions
- average for recessions featuring a banking crisis
- euro area (T=2009)



Sources: ECB, European Commission, BIS, IMF, OECD and ECB calculations.

Notes: 23 OECD countries are considered: 12 euro area countries and 11 other OECD countries (see footnote 5). Averages are based on country data, so euro area aggregates are not included. Period "T" represents the first year of recession. For definitions of recessions and banking crises, see the main text and footnote 8. Euro area data for 2011 are estimates based on data up to the November of that year.

## AVERAGE NARROW MONEY GROWTH AROUND THE TIME OF CRISIS PERIODS

Growth in real narrow money,<sup>9</sup> M1, tends to be closely related to growth in real activity. However, while it is a less reliable indicator of the strength of real GDP growth, real M1 growth tends to be a good leading indicator of turning points in economic growth. Thus, while, for the

7 Broad money is approximated here by M3 or, where this is not possible, M2. These series are deflated using harmonised indices of consumer prices or, where this is not possible, consumer price indices. The principal data sources are the ECB and the European Commission (AMECO database), with missing data obtained from the BIS (BISM database), the IMF (IFS database) and the OECD (Economic Outlook database). Averages are based on country data, so do not include euro area aggregates.

8 Recessions accompanied by banking crises are defined as recessions (i.e. periods of one or more years of negative real GDP growth) featuring a banking crisis either during the recession or in the years directly preceding or following it. Using this definition, of the 87 recessions considered in the sample, 23 also saw a banking crisis, including 17 in the period before 2007. The evidence does not change significantly if averages exclude the recessions of 2008-10.

9 Narrow money is measured here by M1 for all countries. For data treatment and sources, see footnote 7.

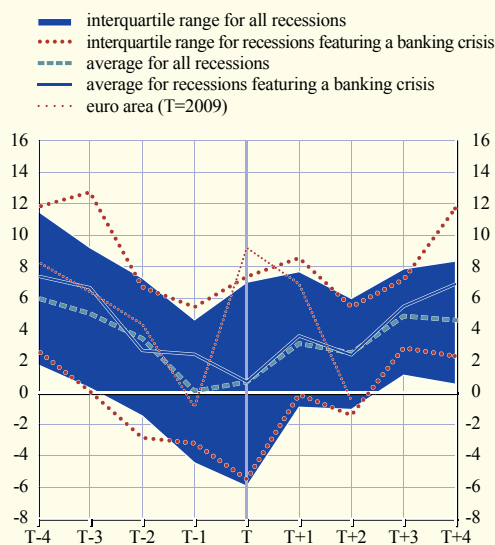
sample under consideration, the average correlation between real narrow money growth and real GDP growth is significant, but not very substantial (23%), the informational content of real M1 growth just before and after recessions appears to be highly valuable. Indeed, it appears that, on average, real M1 growth tends to decline to levels close to zero in the year preceding a recession, before beginning to slowly recover in the first year of recession (see Chart 5). However, where recessions coincide with a banking crisis, real M1 growth generally tends to decline further in the first year of recession. This suggests that, on average, broad and narrow money growth tend to diverge during the first year of recession, although this is less likely where recessions feature a banking crisis. This divergence is likely to reflect the differing degrees of liquidity of the main components of broad money, with narrow money attracting funds in periods of heightened uncertainty at the

expense of other components (e.g. owing to the lower opportunity costs of holding currency and overnight deposits during such periods) and allowing faster action in terms of reallocating funds in response to changes to the economic outlook.

The variability of real narrow money growth around the time of recessions is clearly higher than that of real broad money growth, as indicated by the average difference of 9 percentage points between the upper and lower quartiles. Recent developments in euro area real M1 growth appear to have deviated somewhat from these general patterns, particularly with regard to the strong recovery observed in 2009 and its subsequent decline. These latest developments, to a large extent, do not conform to general historical patterns as regards the period following a recession – whether with or without a banking crisis. Consequently, such developments are probably linked to factors specific to the last few years, especially the particularly high degree of uncertainty and volatility.

**Chart 5 Average real narrow money growth around the time of recessions and banking crises**

(annual percentage changes; percentage points)



Sources: ECB, European Commission, BIS, IMF, OECD and ECB calculations.

Notes: 23 OECD countries are considered: 12 euro area countries and 11 other OECD countries (see footnote 5). Averages are based on country data, so euro area aggregates are not included. Period “T” represents the first year of recession. For definitions of recessions and banking crises, see the main text and footnote 8. Euro area data for 2011 are estimates based on data up to the November of that year.

#### AVERAGE DOMESTIC CREDIT GROWTH AROUND THE TIME OF CRISIS PERIODS

Real domestic credit growth<sup>10</sup> tends to be highly synchronised with real GDP growth and often appears to lag slightly behind turning points in the growth of real economic activity. This is confirmed by patterns in average domestic credit growth around the time of crisis periods in OECD countries over the past five decades. For example, real credit growth has tended to decline in the two years immediately preceding a recession and then decline further the following year, before recovering only gradually in

<sup>10</sup> Domestic credit is approximated here by loans issued by the banking sector to domestic residents other than banks. Historical data mainly concern credit, rather than just loans to residents (i.e. they include other forms of claim on the non-financial private sector, such as corporate bonds), so data on loan growth are extended backwards using data on domestic credit growth. These series are deflated using harmonised indices of consumer prices or, where this is not possible, consumer price indices. The principal data sources are the ECB, the BIS (BISM database) and the IMF (IFS database). Averages are based on country data, so euro area aggregates are not included.

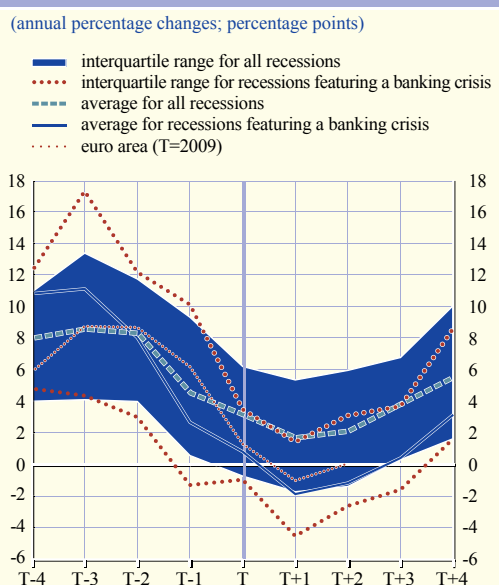
subsequent years (see Chart 6). Real credit growth generally tends to decline more markedly where recessions are accompanied by banking crises, even turning negative in the two years following the first year of recession. This indicates that broad money growth and its main counterpart (i.e. domestic credit growth) tend to diverge after the first year of recession. This is likely to reflect the “credit-less” recoveries which are often observed and can be linked to various factors. First, while broad money is supported by the aforementioned shifting of funds towards more liquid assets, banks may find it increasingly difficult to attract funds in capital markets. This, in turn, implies a tightening of their balance sheets, a reduction in loan supply and the need to pursue deleveraging during recessions (with deleveraging potentially extending into the initial recovery phase until the sustainability of the recovery becomes clear). Needless to say, these problems are more

severe in the case of recessions accompanied by a banking crisis, which are often characterised by a decline in total bank assets and a decrease in the size of banks’ loan portfolios (in real terms).<sup>11</sup> Second, in order to limit the share of non-performing loans (which tends to increase during recessions), and given asymmetric information problems such as adverse selection and moral hazard, banks may prefer to restrict the volume of loans granted, rather than predominantly adjusting lending rates. Third, in the initial phases of a recovery, non-financial corporations may favour using internal sources of funding, market-based funding and intra-company loans, in order to finance their investment needs, to contain their exposure to the banking system and to limit their indebtedness ratios.

As regards the degree of variability seen in real credit growth around the time of recessions, this appears relatively high compared with that of real broad money growth, and only slightly lower than that of real narrow money growth (the average difference between the upper and lower quartiles being 8 percentage points). Developments in euro area real domestic credit growth over the past few years are broadly in line with those observed in previous recessions accompanied by banking crises.

Overall, the following conclusions emerge from the evidence presented. On average, real broad money growth tends to move in line with real GDP growth around the time of a recession, while real narrow money growth tends to lead the turnaround in economic activity and real domestic credit growth tends to lag behind the business cycle. As a result, both the main component and the main counterpart of broad money have a tendency to diverge from M3 growth around the time of a recession and in the initial phases of a recovery. Such divergence has, to some extent, also been observed for certain notable historical episodes, such as the Great Depression in the United States and the “lost decade” in Japan

**Chart 6 Average real domestic credit growth around the time of recessions and banking crises**



Sources: ECB, European Commission, BIS, IMF, OECD and ECB calculations.  
 Notes: 23 OECD countries are considered: 12 euro area countries and 11 other OECD countries (see footnote 5). Averages are based on country data, so euro area aggregates are not included. Period “T” represents the first year of recession. For definitions of recessions and banking crises, see the main text and footnote 8. Euro area data for 2011 are estimates based on data up to the November of that year.

<sup>11</sup> See, for example, the evidence reported in Box 3 (“The banking sector during systemic crises: lessons from the past”) in the article entitled “The latest euro area recession in a historical context”, *Monthly Bulletin*, ECB, November 2009.

(which are considered in Boxes 1 and 2 respectively). The evidence presented in these two boxes also confirms the importance of any accompanying banking crisis in terms of the pattern of money and credit growth. Real narrow money growth and, to a lesser extent, real domestic credit growth tend to exhibit a much greater degree of variability than real broad

money growth around the time of recessions featuring a banking crisis. Recent developments in euro area monetary and credit aggregates tend to conform to these general patterns, particularly when recessions featuring banking crises are taken as a point of reference (albeit with the possible exception of real M1 growth, the volatility of which has been more marked than usual).

## Box 1

## MONEY AND CREDIT IN THE UNITED STATES DURING THE GREAT DEPRESSION

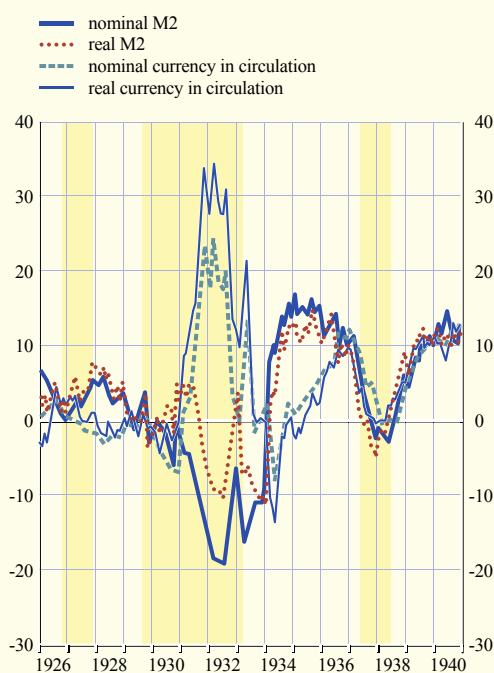
The severity and nature of the recent financial crisis have led several commentators to draw comparisons with the Great Depression in the United States in the 1930s. Focusing on money and credit developments in particular, two specific observations can be made. First, during the downturn (i.e. the period from 1929 to 1933), money and credit declined significantly: the collapse in credit was of a magnitude broadly similar to that seen in economic activity over the same period, while the contraction in money was more contained. Second, during the economic recovery, money and credit followed divergent paths. While money grew in line with economic activity, the level of credit bottomed out at a later stage and did not increase until the second half of the decade, with the economy experiencing a kind of “credit-less” recovery.

The Great Depression lasted for more than three and a half years. This severe downturn was accompanied by several banking crises (from 1930 to 1933) and a protracted period of deflation. The final banking crisis culminated in the proclamation of a week-long nationwide banking holiday in March 1933, after which the United States suspended the gold standard.

In both nominal and real terms, M2 experienced substantial declines during this episode. These declines persisted over a long period and were deep (with the annual rate of contraction reaching 20% in nominal terms and 10% in real terms), aggravated by a series of bank runs beginning in the autumn of 1930 (see Chart A). It was only after the banking holiday and the suspension of the gold standard that broad money recovered on a more sustainable basis.

Chart A Growth in US broad money and currency in circulation during the Great Depression

(annual percentage changes)



Sources: NBER, US Bureau of Labor Statistics and ECB calculations.

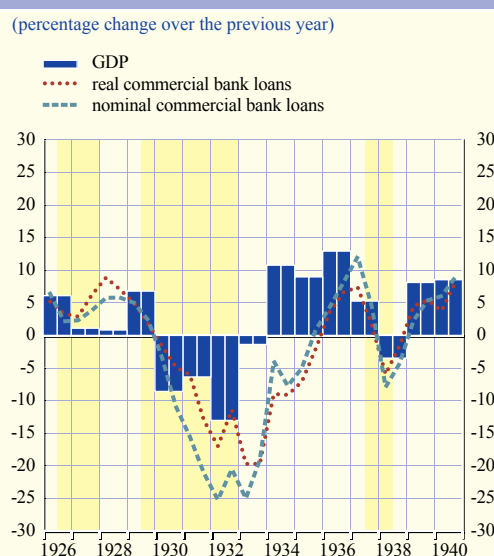
Notes: Monthly data for M2 and currency in circulation and real M2 and currency in circulation are deflated using the CPI index. Shaded areas denote periods of recession as defined by the NBER.

Broad and narrow money returned to their pre-Depression levels in 1936 – i.e. three years after the end of the recession. The decline in money reflected households’ conversion of deposits into cash during the bank runs, as can be seen from the increase observed in currency in circulation in the early 1930s. At the same time, demand and time deposits held with banks decreased in nominal terms and did not begin to recover until 1933. The stable money growth observed post-1933 coincided with the economic recovery and, according to Romer<sup>1</sup>, and Friedman and Schwartz,<sup>2</sup> was prompted by capital inflows from abroad, which, in turn, reflected the unstable political situation in Europe (which was on the brink of the Second World War) and the reintroduction of the gold standard in the United States in 1934.

Turning to credit developments, real credit experienced an unprecedented contraction, both in nominal and in real terms (see Chart B). Real credit growth began decelerating rapidly in 1929 and by mid-1930 had turned negative in line with the decline in output. While the contraction during the first year of the Great Depression was not unprecedented in scale, the credit situation worsened dramatically when the severe banking crises began in October 1930. Between 1931 and 1933 the contraction of credit accelerated, with annual rates in real terms ranging between 10% and 20%, and this negative trend continued beyond the end of the economic downturn. The rate of contraction did not moderate until 1934, and annual credit growth did not turn positive until 1936 – i.e. three years after the end of the Great Depression. By that time, the cumulative contraction relative to pre-Depression levels was almost 50%.

Several factors can explain the steep decline and slow recovery in credit. First, given the depth of the economic downturn, credit might simply have responded to the decline in aggregate output and demand. However, this does not adequately explain the continued contraction in credit following the start of the economic recovery. Second, credit developments can perhaps be explained by supply constraints arising from banks’ need to replenish their stock of information on borrowers, which is generally accumulated over time. This information was lost with the exceptionally large number of bank failures observed as of 1930, which ultimately saw the number of operating banks reduced by almost 50%. Changes in banks’ behaviour also played a role, as the prevailing uncertainty contributed to a precautionary rise in reserve-to-deposit ratios and an increase in banks’ preference for liquid assets, such as Treasury debt discountable at the Federal Reserve. The result was that a smaller share of banks’ available funds could be used to

**Chart B US credit growth during the Great Depression**



Sources: US Bureau of Economic Analysis, US Bureau of Labor Statistics and ECB calculations.  
Notes: Biannual data for credit are based on loan balances in June and December of each year. Real credit is deflated using the CPI index. Shaded areas denote periods of recession as defined by the NBER.

1 See Romer, Christina, “What ended the Great Depression?”, *The Journal of Economic History*, Vol. 52, No 4, 1992, pp. 757-784. She concludes that the surge observed in money supply (as measured by M1) could not be attributed to endogenous demand-driven adjustment, as neither the deposit-to-reserve ratio nor the deposit-to-currency ratio increased in the period between 1933 and 1940. Such changes are necessary conditions for an endogenous increase in M1, given a monetary base at a certain level.

2 See Friedman, M. and Schwartz, A., *A Monetary History of the United States, 1867-1960*, Princeton University Press, Princeton, 1963.



issue long-term, illiquid credit to private borrowers.<sup>3</sup> Finally, credit demand factors may also have played a role, as there may have been a desire to keep debt ratios at levels lower than those observed before the Great Depression.

In conclusion, the decline seen in money and credit during the Great Depression was dramatic. The recovery was sluggish, and in the case of credit, it was not completed for a very long time. The decoupling of money and credit in the recovery phase can be explained as follows. On the one hand, the developments in money reflected the gradual return of confidence in the stability of the banking system.<sup>4</sup> This was boosted by the economic recovery and benefited from large foreign capital inflows. On the other hand, the subdued credit developments can generally be explained by supply constraints arising from banks' need to replenish their stock of information on borrowers, which had been lost during the various banking crises, as well as banks' increased preference for assets perceived as being more liquid or having better risk characteristics.

<sup>3</sup> See Bernanke, Ben, "Non-Monetary Effects of the Financial Crisis in the Propagation of the Great Depression", *American Economic Review*, Vol. 73, No 3, 1983, pp. 257-276.

<sup>4</sup> Following the panic observed in the banking system in 1933, the United States introduced a number of measures to safeguard financial stability, including a permanent deposit insurance scheme.

## Box 2

### LESSONS FROM ASIA: MONEY AND CREDIT GROWTH IN JAPAN DURING AND AFTER THE "LOST DECADE" AND IN EMERGING ECONOMIES IN ASIA IN TIMES OF CRISIS

The crisis experienced by Japan during the 1990s (a period often referred to as its "lost decade") and the Asian crisis of 1997 to 1999 share some similarities with the recent economic and financial crisis in the euro area. Consequently, insight can be gained by comparing developments in money and credit growth during these two episodes. Accordingly, this box comprises two sections. The first considers money and credit growth in Japan during and after the lost decade, while the second discusses money and credit growth in emerging economies in Asia during the Asian crisis.

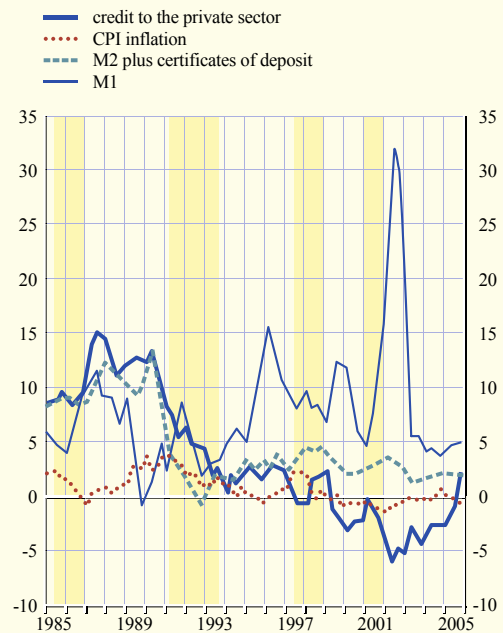
#### Money and credit during Japan's lost decade

This section documents three main observations regarding money and credit developments in Japan during the 1990s. First, the trend growth rates of money and credit fell dramatically following the collapse in stock and land prices in 1990 and 1991. Second, after initially moving in line with each other, money and credit growth began to diverge with the onset of the Asian crisis in 1997. While broader monetary aggregates continued to increase at a moderate but stable pace, the recovery in economic activity following the Asian crisis was not accompanied by growth in private sector credit, which contracted for almost an entire decade. Third, the moderate growth of broad money coincided with a strong expansion in narrow money and a surge in credit to the public sector. Japan's experience suggests both that money and credit growth may remain subdued for a prolonged period of time following financial turmoil and that credit growth in particular may remain weak while deficiencies continue to prevail in the banking system.

Two main arguments have been put forward in the literature to explain the decoupling of money and credit in Japan during the lost decade: the “credit crunch” and “liquidity trap” hypotheses. The credit crunch hypothesis stresses the delayed regulatory response and the importance of credit supply conditions for the divergence of money and credit growth. The sharp decline observed in stock and land prices in the early 1990s resulted in large losses for the corporate sector, as well as affecting companies’ creditworthiness by reducing the value of their collateral. However, this did not lead to an immediate reduction in credit. Banks continued to extend existing loans to troubled companies in order to limit defaults and loan write-offs (a process termed “zombie lending”<sup>1</sup>). In the absence of large deposit withdrawals during this period, banks had little incentive to clean up their balance sheets and instead tried to cover up problem loans. In turn, the outstanding stock of credit granted to the private sector initially remained broadly unchanged. Credit growth declined to almost zero and increased only modestly when the economy recovered in 1994 (see Chart A).

**Chart A Money and credit growth during and after Japan’s lost decade**

(annual percentage changes; quarterly data)



Sources: Bank of Japan, Japanese Cabinet Office, IMF and ECB calculations.  
Notes: Shaded areas denote periods of recession. Data are adjusted for inconsistencies between the Bank of Japan’s Monetary Survey and the IMF’s IFS statistics.

It was only after a series of bank failures in 1997 that the government tackled the problem of the non-performing loan overhang by introducing legislation that limited forbearance and forced the recapitalisation of weak banks. Many commentators have concluded that the protracted period of credit contraction that followed was a consequence of procrastination with regard to the cleaning-up of problem loans.<sup>2</sup> Indeed, empirical research finds that the loan losses resulting from prudential reforms in 1997 had a negative effect on banks’ capital buffers, which, in turn, limited their ability to extend credit to private companies.<sup>3</sup> Instead, banks increased their exposure to government debt, which carried a risk weight of zero and did not, therefore, imply any additional capital requirements.

By contrast, proponents of the liquidity trap hypothesis argue that the decoupling of narrow and broad money growth was the result of Japan falling into a situation where nominal interest

1 Caballero, R.J., Hoshi, T. and Kashyap, A.K., “Zombie Lending and Depressed Restructuring in Japan”, *American Economic Review*, Vol. 98, No 5, 2008, pp. 1943-1977.  
2 See, for instance, Sekine, T., “Firm Investment and Balance Sheet Problems in Japan”, *Working Paper Series*, No 99/111, IMF, Washington DC, 1999; Kanaya, A. and Woo, D., “The Japanese Banking Crisis of the 1990s: Sources and Lessons”, *Working Paper Series*, No 00/7, IMF, Washington DC, 2000; and Callen, T. and Ostry, J.D., *Japan’s Lost Decade. Policies for Economic Revival*, IMF, Washington DC, 2003.  
3 See, for instance, Watanabe, W., “Prudential Regulation and the ‘Credit Crunch’: Evidence from Japan”, *Journal of Money, Credit and Banking*, Vol. 39, No 2-3, 2007, pp. 639-665; and Woo, D., “In Search of the ‘Capital Crunch’: Supply Factors Behind the Credit Slowdown in Japan”, *Journal of Money, Credit and Banking*, Vol. 35, No 6 (Part 1), 2003, pp. 1019-1038.

rates were either at or close to zero and conventional monetary policies that increase the monetary base were rendered impotent, as base money and bonds become perfect substitutes for private investors.<sup>4</sup>

As of the mid-1990s, when interest rates approached zero, demand for money became disconnected from real economic developments. According to the liquidity trap hypothesis, this reflected an increase in precautionary demand for money amid financial instability and growing volumes of non-performing assets on banks' balance sheets.<sup>5</sup> Banks increasingly preferred liquid assets, which also began to be seen in the stronger growth of credit to the public sector (mainly via holdings of government bonds). Moreover, the zero lower bound constrained the central bank's ability to further promote private credit growth by lowering nominal interest rates, since real interest rates remained positive in the deflationary environment. Krugman<sup>6</sup> and Bernanke<sup>7</sup> argue that an earlier policy response could have helped to avoid the zero lower bound. As the persistent deflationary pressures in the economy did not disappear, the Bank of Japan eventually introduced non-conventional monetary policy measures between 2001 and 2006, conducting a policy of "quantitative easing".

### Money and credit in emerging economies in Asia in times of crisis

This section investigates the behaviour of monetary and credit aggregates in emerging economies in Asia during the Asian crisis of 1997 to 1999. Developments at this time are compared with the corresponding patterns during the global crisis that followed the collapse of Lehman Brothers in 2008. Although the two crises differ substantially in terms of their origins and the magnitude of the shocks involved, in both cases large capital outflows put pressure on domestic exchange rates, prompting balance of payments tensions. However, in 1997 and 1998 this was eventually associated with a banking crisis, whereas banks were much less affected in 2008 and 2009. Consequently, the emergence of a "twin crisis" – i.e. both a financial and an exchange rate crisis – led to a strong and prolonged decline both in real output and in the supply of credit to the private sector during the 1990s, as opposed to the milder contraction and faster recovery observed in recent years. The remainder of this section looks at differences between these two episodes in terms of the behaviour of monetary and credit aggregates.

A large withdrawal of funds from domestic financial markets marked the beginning of the Asian crisis of 1997 to 1999, a crisis ultimately precipitated by investors discovering that local banks were overexposed to underperforming assets. The subsequent political instability and uncertainty regarding the actual implementation of banking sector reforms resulted in markets overreacting and herding behaviour being displayed, leading to the sharp depreciation of currencies. The contraction in financial markets then led to a collapse in real GDP growth throughout the region.

In the third quarter of 2008 emerging Asian economies were also significantly affected by the global financial crisis that followed the collapse of Lehman Brothers. Deleveraging by global financial institutions and heightened risk aversion raised the cost of external financing in emerging

4 See Krugman, P., "It's baaack: Japan's slump and the return of the liquidity trap", *Brookings Papers on Economic Activity*, Vol. 29, No 2, 1998, pp. 137-206; and Bernanke, B., "Japanese Monetary Policy: A Case of Self-Induced Paralysis", in Mikitani, R. and Posen, A. (eds.), *Japan's financial crisis and its parallels to the US experience*, Institute for International Economics, Washington DC, 2000, pp.149-166.

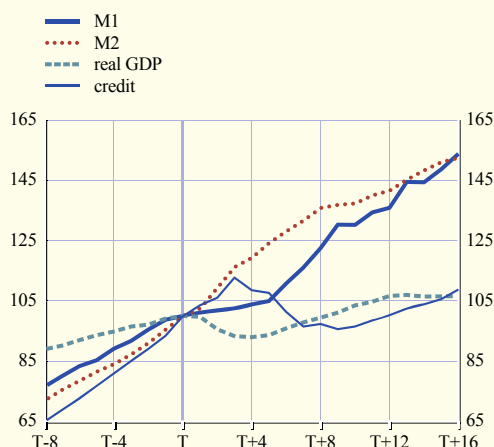
5 Iwata, K., *The role of money and monetary policy in Japan*, speech at the Fourth ECB Central Banking Conference on "The Role of Money: Money and Monetary Policy in the Twenty-First Century", Frankfurt am Main, 9-10 November 2006.

6 See the paper referred to in footnote 4.

7 See the paper referred to in footnote 4.

**Chart B Developments in money and credit growth around the time of the Asian crisis of 1997 to 1999**

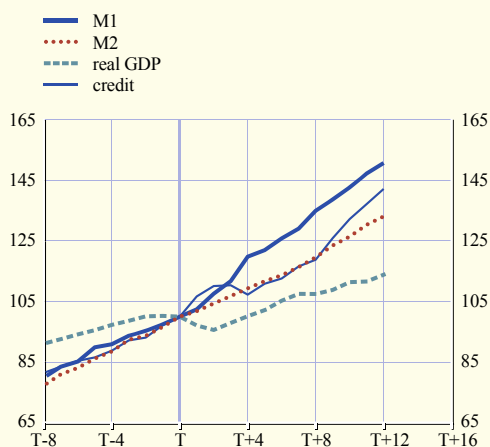
(index: T=100; quarterly averages)



Source: Haver Analytics.  
Notes: Data are for Hong Kong SAR, Indonesia, Malaysia, the Philippines, South Korea and Thailand. "T" represents the third quarter of 1997.

**Chart C Developments in money and credit growth around the time of the collapse of Lehman Brothers in 2008**

(index: T=100; quarterly averages)



Source: Haver Analytics.  
Notes: Data are for Hong Kong SAR, Indonesia, Malaysia, the Philippines, South Korea and Thailand. "T" represents the third quarter of 2008.

markets and reduced its availability. Between the end of August and the end of November 2008, equity prices fell and the cost of credit default swaps increased throughout the region, indicating an increase in investors' perception of risk; exchange rates declined somewhat against the US dollar, but a full-blown balance of payments crisis did not develop. Moreover, thanks to proactive policy measures and sound fundamentals, output swiftly returned to pre-crisis levels.

Charts B and C show the general evolution of key monetary variables for a number of emerging Asian economies over a six-year period around the time of the Asian crisis and the collapse of Lehman Brothers in 2008. Overall, the Asian crisis had a greater impact on monetary developments in the economies selected. Domestic credit (defined as claims on the private sector) increased initially in the aftermath of both crises, yet the subsequent peak-to-trough decline during the Asian crisis was much more severe. Moreover, domestic credit did not return to pre-crisis levels until 12 quarters after the 1997 shock, whereas, with the exception of one single quarter (i.e. the third quarter of 2009), it maintained its upward trajectory following the collapse of Lehman Brothers. Meanwhile, narrow money (i.e. M1) increased more rapidly in the first four quarters after the Asian crisis broke out, before growing at a more subdued pace in the period immediately after the crisis; developments in M1 after the collapse of Lehman Brothers in 2008 were similar, albeit less striking. At the same time, there is no significant difference between the two crises in terms of the behaviour of broad money (i.e. M2). By contrast, real GDP did not return to pre-crisis levels until three years after the outbreak of the Asian crisis, as opposed to five quarters after the collapse of Lehman Brothers.

Despite differences in terms of the origins and magnitudes of the two shocks, the heterogeneous impact of these two crises on money and credit growth can, to a large extent, be explained by the significantly weaker banking system in emerging Asian economies in the late 1990s and the constrained political environment at that time. In that crisis, the Asian banking system as a whole was highly vulnerable to external short-term funding pressures; moreover, the majority

of banks had invested too heavily in risky and poorly performing projects.<sup>8</sup> In addition, the monetary and interest rate policies of governments which had entered into IMF programmes were constrained by tight limits and conditions. On the other hand, in 2008 and the years that followed, governments were able to counter the external turmoil by easing monetary and fiscal policy in the presence of much improved fundamentals, benefiting from the restructuring and strengthening of banking systems that had taken place in the previous decade.

8 Corsetti, G., Pesenti, P. and Roubini, N., “What Caused the Asian Currency and Financial Crisis?”, *Japan and the World Economy*, Vol. 11, No 3, 1998, pp. 305-373.

### 3 MAIN FACTORS DRIVING MONEY AND CREDIT GROWTH AROUND THE TIME OF CRISIS PERIODS

Several factors account for the divergence of money and credit growth around the time of economic and financial crises in advanced economies. This section will review some of the main factors, as well as discuss factors which may be unique to recent years and thus imply possible deviations from historical averages.

#### APPROXIMATE CAUSES AND PROPAGATION CHANNELS OF CRISES

Developments in monetary and credit aggregates around the time of recessions are likely to be determined by the approximate causes and principal propagation channels underlying an economic crisis. More specifically, the role played by financial factors in precipitating and propagating a crisis is likely to be of key importance in assessing developments in money and credit growth. Accordingly, there is a large body of economic literature considering the role of money and credit during recessions and financial crises from a historical perspective.<sup>12</sup> A key finding is that major global economic and financial crises are often preceded by high levels of money and credit growth (typically triggered by overly optimistic expectations of strong economic growth) and accompanied by macroeconomic imbalances such as budget or current account deficits, leading to an abundance of liquidity. In order to benefit from and participate in ongoing booms, market participants have an incentive to focus on short-term capital gains, which increasingly become

decoupled from real productivity gains. A boom suddenly transforms into a bust when confidence in debtors' ability to honour their financial obligations is jolted or evaporates completely. As a consequence, asset prices drop sharply, the value of securities decreases significantly (or is erased entirely), and financial markets freeze up, partly fail or collapse completely.<sup>13</sup> At a macroeconomic level, interaction between asset prices and money and credit takes place through a variety of channels. For example, asset price booms and busts affect demand for money, as the returns on various assets determine money holdings in the context of a broader portfolio allocation problem. Moreover, credit dynamics are affected by asset price booms and busts – e.g. via the balance sheets of non-financial corporations and households or other channels. More precisely, the borrowing constraints faced by such agents (arising from asymmetric information problems in credit markets) tighten when, following an asset

12 Literature on the role of money and credit in the macroeconomy over the business cycle ranges from the contributions of Irving Fisher (e.g. “The Debt-Deflation Theory of Great Depressions”, *Econometrica*, Vol. 1, No 4, 1933, pp. 337-357), who discusses the role of monetary factors and debt deflation in propagating downturns, to those of Friedman and Schwartz, and Bernanke (see the publications referred to in footnotes 2 and 3 respectively in Box 1), who consider the role of money and credit in the Great Depression in the United States. For a more recent discussion of the role of money and credit in the macroeconomy, see the publication referred to in footnote 1 (particularly Chapter 1) and Freixas, X. and Rochet, J.-C., *Microeconomics of Banking*, MIT Press, 2008 (particularly Chapter 6), respectively.

13 See, for example, Kindleberger, C. and Aliber, R., *Manias, Panics, and Crashes: A History of Financial Crises*, Palgrave Macmillan, 2005, which provides detailed historical analysis of the role played by monetary and credit factors in financial crises, and the publication referred to in footnote 6, which looks in detail at the role played by debt in precipitating and propagating financial crises.

price bust, their net worth decreases, thereby lowering the value of the collateral against which loans can be secured.<sup>14</sup>

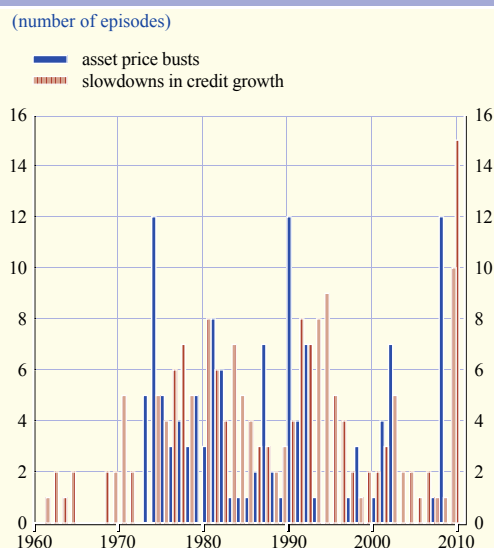
The period since the Second World War has witnessed unprecedented expansion in the financial sector. This has coincided with important changes, such as the financial innovation, the easing of financial regulation and the financial globalisation observed in recent decades, particularly prior to the outbreak of the recent financial crisis.<sup>15</sup> As a result, along with several benefits, such as increased availability of credit to households and firms for consumption and investment purposes, these changes have also increased the importance of the financial sector, both as a source of instability and as a propagator of shocks originating elsewhere in the economy.

Evidence suggests that most of the recessions experienced in OECD economies since 1960 (i.e. the mid-1970s, the early 1980s, the early 1990s and the period from 2008 to 2010, as indicated in Chart 3) were also accompanied by financial crises spanning several countries. For example, as already shown, in a number of countries the recessions of the early 1990s and 2008-10 also featured a systemic banking crisis. Furthermore, there have also been waves in which asset price bubbles have burst<sup>16</sup> and credit growth has slowed,<sup>17</sup> and these have tended to overlap with recessions (although they have also occurred at other times, such as the early 2000s; see Chart 7).<sup>18</sup>

Overall, the most far-reaching economic crises have been accompanied by some form of financial crisis unfolding in several countries simultaneously. Thus, it is not surprising that marked fluctuations in money and credit growth are observed around the time of most recessions. However, the past few years have been characterised by a deeper and more widespread economic and financial crisis.

The role played by the financial sector in originating and propagating the most recent crisis is undisputed and is associated, for

**Chart 7 Asset price busts and slowdowns in credit growth**



Sources: European Commission, Eurostat, IMF, OECD and ECB calculations.  
 Notes: 23 OECD countries are considered: 12 euro area countries and 11 other OECD countries (see footnote 5). For definitions of asset price busts and slowdowns in credit growth, see the main text and footnotes 16 and 17. Data on asset price busts are available only for the period from 1970 to 2008.

example, with bubbles in housing and mortgage markets and fundamental changes in the banking system (such as the expansion of securitisation

14 See the publication referred to in footnote 1 (particularly Chapter 6) for a more detailed overview of the channels linking asset prices, money and credit.

15 See, for example, Schularick, M. and Taylor, A., "Credit booms gone bust: monetary policy, leverage cycles and financial crises, 1870-2008", *NBER Working Paper Series*, No 15512, NBER, November 2009.

16 Asset price busts are identified for 17 OECD economies between 1970 and 2008 in Gerdesmeier, D., Reimers, H.E. and Roffia, B., "Asset price misalignments and the role of money and credit", *Working Paper Series*, No 1068, ECB, July 2009. The results are broadly similar if one uses the chronology (for 18 OECD economies between 1970 and 2007) in Alessi, L. and Detken, C., "Quasi real time early warning indicators for costly asset price boom/bust cycles: a role for global liquidity", *European Journal of Political Economy*, Vol. 27, No 3, 2011, pp.520-533.

17 Slowdowns in credit growth are defined here as periods when the growth rate of real domestic credit is negative.

18 For more evidence on the linkages between recessions and financial crises, see also: Claessens, S., Kose, M.A. and Terrones, M., "What happens during recessions, crunches and busts?", *Economic Policy*, Vol. 24, No 60, October 2009, pp. 653-700; and Claessens, S., Kose, M.A. and Terrones, M., "How do the business and financial cycles interact?", *Working Paper Series*, No 11/88, IMF, Washington DC, April 2011. These authors conclude that the interaction between macroeconomic and financial variables plays a key role in determining the severity and duration of recessions.

markets).<sup>19</sup> Looking ahead, the unprecedented role played by banking and credit markets in recent crises, at least as regards the period since the Second World War, suggests that the possibility of euro area money and credit growth deviating from historical averages cannot be ruled out. One particular feature of recent years is the historically very high levels of indebtedness on the part of both the private and public sector in most OECD countries.<sup>20</sup> This suggests that, following a recession, one might expect the recovery in credit growth to be weaker than usual, as economic agents may attempt – or be forced – to limit their indebtedness in order to prevent it from reaching unsustainable levels. This may, therefore, signal a need for more drastic restructuring, which could delay a more dynamic recovery in real GDP in several advanced economies, including the euro area. Thus, weaker credit growth is likely to affect economic activity, which, owing to structural factors, will also have a dampening effect on money and credit growth for a prolonged period of time.

### INTERNATIONAL DIMENSION OF CRISES

The international dimension is also likely to be an important aspect in explaining money and credit growth around the time of recessions and banking crises. Of course, the severity, propagation and duration of economic and financial turmoil will be amplified in the case of a widespread international crisis that results in negative spillovers for the domestic economy and offers little scope for taking advantage of economic expansion abroad.

The analysis presented above suggests that several episodes have seen crises experienced by a number of economies simultaneously. Another aspect which is of relevance here is the fact that systemic events in the global economy (particularly in major economies) have, over the past 50 years, been more frequent in times of relatively strong growth in global liquidity, as measured by the rates of growth of global monetary and credit aggregates. Thus, to the extent that liquidity conditions in

major advanced economies are increasingly interrelated, and given the increasingly integrated nature of global financial markets, global liquidity conditions can have important implications for domestic economies and need to be taken into account.

Developments in real broad money growth around the time of recessions have tended to vary depending on whether global liquidity levels are relatively moderate or abundant. In the case of the former, there is only a mild, short-lived moderation in real broad money growth, while in the case of the latter, there is a protracted decline in real broad money growth during the recovery. Developments in the euro area during and after the recent recession are broadly in line with patterns observed in the presence of abundant global liquidity (see Chart 8),<sup>21</sup> and similar evidence can be found for real domestic credit growth. Such evidence is consistent with the view that global liquidity reached buoyant levels before the recession, with a significant correction taking place only after 2009.

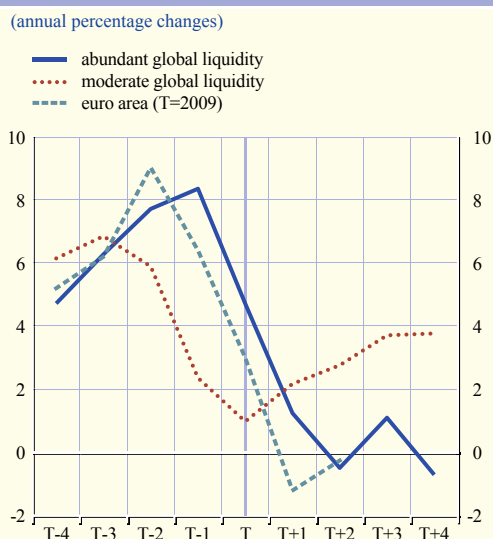
The reason why developments in money and credit vary depending on the level of global liquidity is that global liquidity conditions, international capital flows and domestic money and credit are directly linked through various channels, as captured by the balance of payments and its monetary presentation. First, international capital flows, which include transactions with the domestic

19 See, for example, Brunnermeier, M., “Deciphering the liquidity and credit crunch 2007-2008”, *Journal of Economic Perspectives*, Vol. 23, No 1, 2009, pp. 77-100.

20 See Reinhart, C. and Rogoff, K., “A Decade of Debt”, *NBER Working Paper Series*, No 16827, NBER, February 2011. The authors demonstrate that in recent years the public debt of advanced economies has reached levels not witnessed since the end of the Second World War, standing at levels even higher than those observed during the First World War and the Great Depression. The same applies to private debt levels. Reinhart and Rogoff’s results underline that, as an empirical regularity, historical highs in terms of leverage have very often been associated with slower economic growth.

21 For the purposes of this analysis, abundant global liquidity is defined as global broad money growth and global domestic credit growth above the 66th percentile. Growth below this threshold is classified as moderate global liquidity.

**Chart 8 Average real broad money growth around the time of recessions featuring abundant and moderate global liquidity**



Sources: ECB, European Commission, BIS, IMF, OECD and ECB calculations.

Notes: 23 OECD countries are considered: 12 euro area countries and 11 other OECD countries (see footnote 5). Period “T” represents the first year of recession. For definitions of abundant and moderate global liquidity, see footnote 21.

money-holding sector (including securities issued by this sector) which are settled via the resident banking sector, lead to changes both in banks’ net external asset position and, often, in the overall stock of money. Thus, capital inflows can, under certain circumstances, contribute to growth in domestic monetary aggregates and, at times, to excessive money growth. Similarly, capital outflows can constrain the availability of money – and ultimately credit – in the domestic economy, with adverse consequences for the financial sector and the real economy. In fact, there is some related evidence suggesting that, on average, countries which were net importers of capital prior to a recession experience a sharper decline in their stock of money than those that were net exporters of capital. Second, the availability of cross-border finance can have a direct impact on domestic credit over and above that implied by domestic monetary conditions. Indeed, cross-border interbank lending is one channel through which the domestic banking system can extend credit above and beyond the limitations established by the available pool of domestic funding.

This helps to explain why the dynamics of credit growth are likely to be more pronounced than those of money around the time of crisis periods.

Overall, the international dimension is an important aspect when assessing patterns in money and credit growth around the time of crisis periods. Indeed, the international dimension of the recent crisis is undoubtedly highly significant, though by no means unprecedented among OECD countries given the demise of the Bretton Woods system and the progressive liberalisation of global capital flows in the 1970s.<sup>22</sup> That being said, this particular crisis has been the most internationally widespread since the Second World War, indicating that this factor may also be a source of deviation from historical averages.

## ECONOMIC POLICIES AND OTHER FACTORS

As the severity of the recent economic and financial crisis has been unprecedented, at least since the Second World War, policy-makers in several advanced economies have implemented some equally unprecedented economic policy measures. Certain measures have been aimed specifically at supporting domestic credit growth, which is considered to be an important aspect of the recovery. With domestic credit being the main counterpart of broad money, this has also affected developments in monetary aggregates. Unparalleled economic policy measures, including non-standard monetary policy measures, are likely to account for the fact that euro area money and credit growth has not deviated significantly from historical averages for crisis periods over the past three to four years. For example, the ECB’s non-standard monetary policy measures have been instrumental in supporting the euro area banking system, considerably improving the liquidity situation. There is also some evidence suggesting that these measures have helped to prevent a

<sup>22</sup> It should be noted that, since most of the crises in the sample considered coincide with an absence of capital controls, it is difficult to assess the impact that such controls have on money and credit dynamics around the time of crisis periods.



significant decline in monetary and credit aggregates, thereby hindering feedback loops with potentially negative consequences for macroeconomic variables.<sup>23</sup>

At the same time, important sources of uncertainty remain. For example, there is uncertainty in respect of the duration and impact of the sovereign debt crisis in certain European countries, as well as regarding the solidity of bank balance sheets in several OECD countries. This uncertainty is likely to have precipitated increased risk aversion on the part of economic agents and contributed to increased volatility in monetary flows in recent years. Such risk aversion leads to expansion in narrow money – and, to some extent, broad money – while credit growth remains contained. Thus, these factors may account for deviations from historical averages. Indeed, it is likely to be these factors that lie behind the unusually large fluctuations observed in real narrow money in 2009 and 2010.

#### 4 CONCLUSION

Patterns in average money and credit growth around the time of past economic and financial crises may provide a useful benchmark for the assessment of current and future developments in money, credit and output. This article has presented evidence showing that such benchmarks need to distinguish between different types of recession, namely by drawing a distinction between those which coincided with a financial crisis and those which did not. This demonstrates the significant interplay between money, credit and output, particularly during such periods. Recent developments in euro area money and credit growth appear to be broadly in line with general patterns observed during previous recessions and recoveries if the recent economic slowdown is compared with recessions accompanied by systemic banking crises. Indeed, the slow recovery observed in broad money growth and domestic credit growth in 2011 is in line with the modest recovery seen in economic activity in 2010 and 2011 following the severe recession in 2008 and 2009. The slow

recovery in monetary and credit aggregates is also likely to reflect the correction of excess growth accumulated prior to the crisis. Moreover, broad money growth, narrow money growth and domestic credit growth typically diverge during such periods, with M1 growth typically leading the turnaround in the business cycle, broad money growth moving in line with the economic cycle (albeit being less pronounced during the downturn) and credit growth generally lagging behind the recovery in economic activity. While recent euro area developments largely conform to these regularities, narrow money growth has fluctuated more markedly than usual in recent years (i.e. compared with typical developments around the time of economic and financial crises), possibly reflecting the exceptionally high levels of volatility and uncertainty observed in the euro area in recent years.

Looking ahead, it is impossible to rule out some intensification in the interplay between euro area monetary and credit aggregates (with the potential for output to deviate from historical averages as a result), mainly owing to the simultaneous presence of various factors. The latter may be associated with: i) the unusually high levels of private and public sector indebtedness observed in recent years; ii) the interplay between the sovereign debt crisis, investors concerns' and pressure on banks' funding and capital in various European countries; and iii) the more pronounced manner in which the crisis has spread internationally.

<sup>23</sup> For evidence on the impact on monetary and credit aggregates, see the article entitled "The ECB's non-standard measures – impact and phasing-out", *Monthly Bulletin*, ECB, July 2011 (particularly Box 2).