

## ARTICLES

# MONETARY POLICY AND LOAN SUPPLY IN THE EURO AREA



*This article examines the monetary policy effects on loan supply in the euro area. While loan developments typically hinge on a combination of factors that impact simultaneously on the demand for, and the supply of, bank loans, the focus of this article is on identifying the importance of supply-side factors for aggregate loan developments and their interaction with monetary policy. The evidence presented in this article suggests that monetary policy may affect banks' ability and willingness to supply loans, as well as the prices banks offer on their loans. The substantial reductions in key ECB interest rates and the introduction of non-standard monetary policy measures during the recent financial crisis should also be seen against the background of this evidence, taking into account the dominant position of the banking sector in the euro area financial system.*

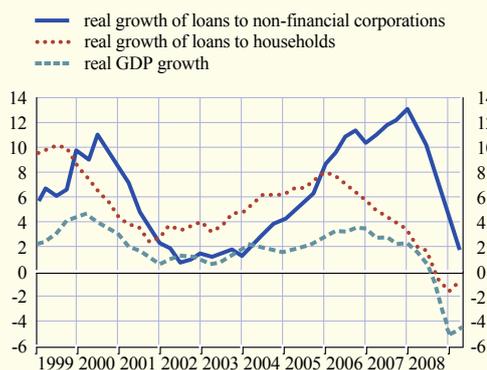
### I INTRODUCTION

In most developed economies, bank lending and, more generally, overall lending by MFIs constitute one of the most important sources of external financing for households and non-financial corporations. Bank lending is a particularly important source of financing in the euro area, where bank loans have accounted for around 85% of the total external financing of the private sector in recent years.<sup>1</sup> Accordingly, the continued smooth functioning of loan supply from the banking system to creditworthy borrowers is a key prerequisite for sustained economic activity, and also for the effective and smooth transmission of the monetary policy stance to the economy. As part of its monetary policy analysis, the ECB thus pays close attention to developments in bank lending and to indications of strains on bank loan supply. For this reason, the sharp decline recorded in recent quarters in the real annual growth rate of loans granted to euro area non-financial corporations and households has been monitored closely (see Chart 1). As in past episodes, the drop in the growth of loans has coincided with the sharp deterioration in economic activity. However, owing to the unprecedented shocks that have hit the financial sector during the financial crisis since mid-2007, it cannot be ruled out that a supply-induced reduction of lending has likewise contributed to amplifying the downturn in the wider economy.

Banks may reduce loan supply by raising loan rates, by lowering loan volumes, or both. Indeed, the Eurosystem's bank lending survey for the euro area provides qualitative

**Chart 1 Real annual growth rate of loans to non-financial corporations and households, and real GDP growth**

(annual percentage changes)



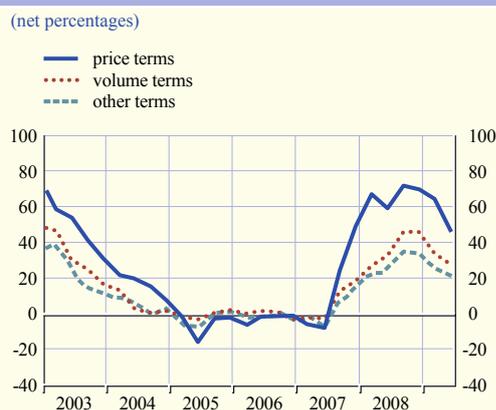
Sources: ECB and Eurostat.  
Note: Deflated by the GDP deflator.

information on the extent to which banks tighten their credit standards via price or volume-related terms and conditions (see Chart 2). On average, the tightening of credit standards since the second half of 2007 has been implemented predominantly through increases in margins. However, more stringent requirements with respect to the quantity of loans (and other non-price terms) also seem to have played a non-negligible role.

Generally, it is rather difficult to identify the supply and demand effects that underlie credit developments, especially as shifts in

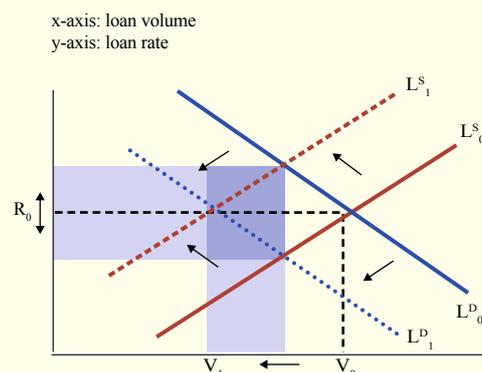
<sup>1</sup> For further details on the importance of bank financing in the euro area financial system, see the articles entitled "The role of banks in the monetary policy transmission mechanism" and "The external financing of households and non-financial corporations" in the August 2008 and April 2009 issues respectively of the Monthly Bulletin.

**Chart 2 Changes in euro area banks' terms and conditions on loans to enterprises**



Source: Eurosystem bank lending survey.  
 Notes: "Price terms" refer to "margins on average loans" and "margins on riskier loans". "Volume terms" refer to "size of loan or credit line" and "collateral requirements". "Other terms" refer to "loan covenants", "non-interest rate charges" and "maturity". The net percentages reported for the three groups are simple averages of the net tightening in the underlying terms listed above.

**Chart 3 Loan supply and demand**



Note:  $L^S$  refers to the loan supply curve, whereas  $L^D$  refers to the loan demand curve.

demand and supply both have an impact on bank lending rates and credit volumes. This is illustrated in a highly stylised manner in Chart 3, which displays the effects on lending rates and the volume of loans in a situation where both supply and demand are reduced. In such a case, the two countervailing factors trigger a reduction in the credit provided to the economy; at the same time, the net effect on lending rates depends on the relative strength of the two effects. The focus of this article is on identifying and assessing the implications for loan volumes and prices from shifts in the loan supply curve ( $L^S$ ).

In practice, the monitoring of the functioning of bank lending and the identification of impairments to credit supply require a detailed knowledge and continuous analysis of the financial system and loan supply decisions by financial intermediaries. In general, it can be expected that a bank's decision to fulfil the demand for loans from its customers will depend on a variety of factors. First, it will depend on the bank's ability to finance the amount of money demanded by the bank's borrowers. This will hinge on the loanable funds it has available in terms of its deposit

base and access to wholesale funding sources, and on the amount of capital it can allocate to the loan, which in turn hinges on regulatory requirements and the disciplining forces of the market. Second, it will be subject to a risk-return calculation that takes into account the opportunity cost and the possible informational asymmetries between banks and their customers. This, among other things, involves weighing a number of considerations, including the bank's assessment of the probability that the loan will be paid back (which is influenced, inter alia, by the collateral values and by the firm-specific and general economic outlook), alternative investment opportunities for the bank and alternative financing sources for the potential borrower. The latter will, in turn, depend on the degree of competition in the banking sector and in the broader financial system, on the banking model of the lender (for example, on the extent to which the bank engages in long-term relationship lending), on the presence of informational frictions and on the bank's degree of risk aversion. All of these factors potentially have an impact on the bank's lending decisions in terms of the volume of loans it is inclined to extend and the price at which it is willing to do so.

Monetary policy has the potential to affect many of the elements that determine banks' lending decisions. In the economic literature, apart from its impact on bank interest rates via the "interest rate channel", the transmission of monetary policy to bank loan supply is traditionally categorised as the "credit channel" of the transmission mechanism. The latter emphasises the impact that changes in monetary policy rates may have on banks' funding and capital positions (the "narrow" credit channel), on the one hand, and on the collateral values and net worth of the banks' borrowers (the "broad" credit channel), on the other. In addition, monetary policy might influence the risk-taking behaviour of banks, and thus the credit standards that banks apply to their loans, by affecting their risk perceptions and willingness to take more risk.<sup>2</sup>

While monetary policy actions are likely to primarily affect the demand for bank loans through the traditional interest rate channel, it is important for the central bank to also be able to identify and monitor as precisely as possible its impact on the supply side of bank lending. From a monetary policy perspective, it is important to know whether developments in aggregate loans to the non-financial private sector are driven by changes in the demand for loans or by those in loan supply. Indeed, the tools and actions that monetary policy-makers may need to employ can differ substantially, depending on whether the central bank aims to affect loan supply, loan demand, or both. In addition, it is important to identify the underlying source of a shock to loan supply. The response of monetary policy may differ substantially if banks reduce loans (and/or tighten credit standards) because the creditworthiness of borrowers has deteriorated, or because they cannot finance themselves in the market. In the first case, a reduction in policy rates would encourage aggregate demand, so that the net worth of corporations and the willingness of banks to lend would increase over time. In the second case, providing the necessary liquidity to banks would enable them to satisfy the demand for loans of profitable firms.

Furthermore, gauging the interaction between monetary policy and loan supply becomes particularly important during crisis periods when the banking sector is under pressure and loan supply is hit by adverse shocks. In such cases, it is crucial for the central bank to have a sound knowledge of the magnitude of implications of monetary policy actions for loan supply in order to alleviate the shocks to loan supply and put banks in a position to fulfil their role as financial intermediaries for the economy. Such policy actions can range from adjustments to key policy rates to a number of so-called "non-standard" measures. The latter comprise, first, the provision of funding liquidity to banks via full-allotment liquidity operations, the widening of the related collateral framework or an extension of the maturity of liquidity operations, as well as the acquisition of bank assets or (securitised) bank debt. Second, they might extend to the direct supply of funds to the real economy via the purchase of debt issued by the private non-financial sector or by providing funds to intermediary state-sponsored banks that act as a catalyst for the extension of credit to small and medium-sized enterprises.

Against this background, this article focuses on the supply side of bank lending and initially reviews the theoretical arguments for links between monetary policy and banks' lending decisions. Second, it presents recent empirical evidence on the credit and risk-taking channels of monetary policy transmission in the euro area, building up on micro-based data and on information from the Eurosystem bank lending survey. Analogously, the impact of both the financial crisis and recent financial innovation on the transmission of monetary policy to loan supply is assessed. Finally, it offers some concluding remarks from a monetary policy perspective.

2 In the literature, this channel of the monetary policy transmission mechanism is often referred to as the "risk-taking channel"; see, for example, C. Borio and H. Zhu, "Capital regulation, risk-taking and monetary policy: A missing link in the transmission mechanism", *BIS Working Paper Series*, No 268, Bank for International Settlements, 2008.

## 2 THE CREDIT CHANNEL FROM A THEORETICAL PERSPECTIVE

This section reviews the theoretical mechanisms that underpin the impact of monetary policy on bank lending, thereby affecting the real economy in turn.<sup>3</sup>

As illustrated in Chart 4, monetary policy – via banks – can affect the economy through several channels. It can have an impact on aggregate demand via the banking system as part of the traditional interest rate channel.<sup>4</sup> Banks determine the pass-through of policy rates to bank lending rates for firms and households.<sup>5</sup> A tightening of monetary policy, which could

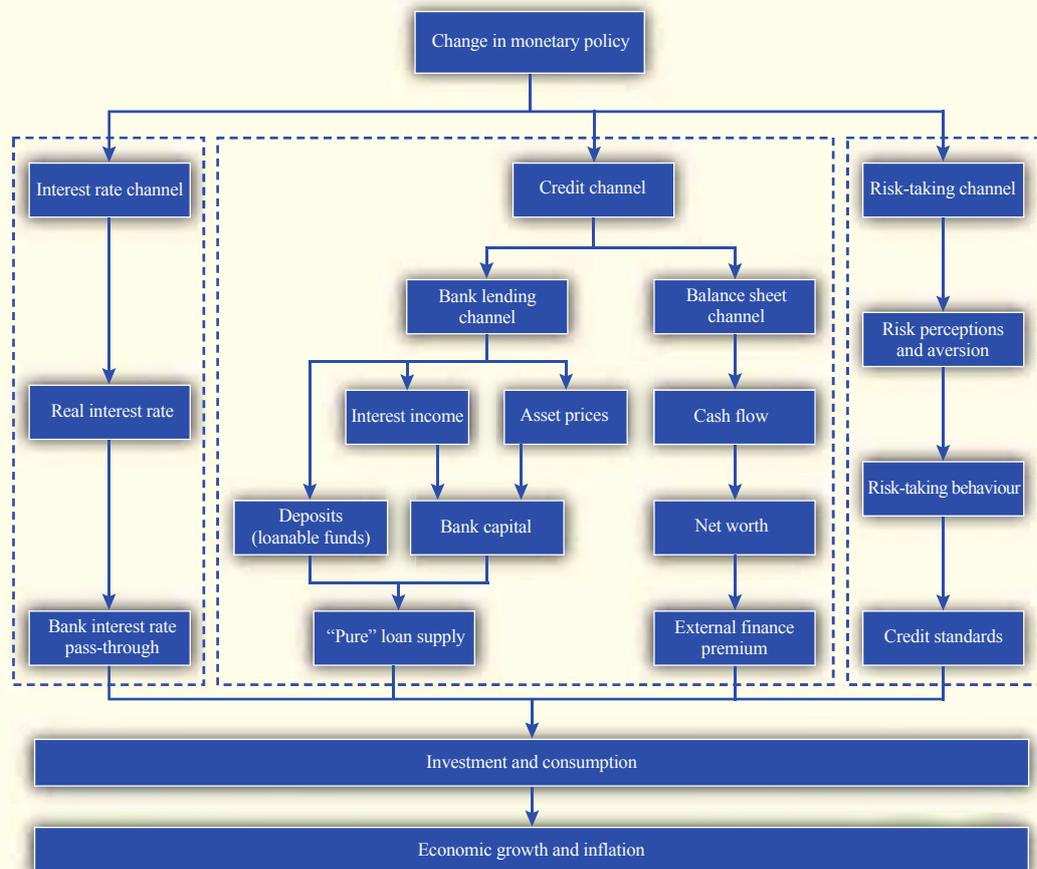
result in higher lending rates, reduces the demand for loans from firms and households, thereby

<sup>3</sup> For a comprehensive overview, see also the article entitled “The role of banks in the monetary policy transmission mechanism” in the August 2008 issue of the Monthly Bulletin.

<sup>4</sup> The interest rate channel works on the assumption that some prices and nominal wages are inflexible (sticky) in the short run. For recent evidence on the broad monetary policy transmission mechanism in the euro area, see, for example, J. Boivin, M.P. Giannoni and B. Mojon, “Macroeconomic dynamics in the euro area”, in D. Acemoglu, K. Rogoff and M. Woodford (eds.), *NBER Macroeconomics Annual 2008*, National Bureau of Economic Research, 2008. For evidence in the early 2000s, see the studies conducted by the Eurosystem Monetary Transmission Network, which have been collected in I. Angeloni, A.N. Kashyap and B. Mojon (eds.), *Monetary policy transmission in the euro area*, Cambridge University Press, 2003.

<sup>5</sup> See the article entitled “Recent developments in the retail bank interest rate pass-through in the euro area” in the August 2009 issue of the Monthly Bulletin.

Chart 4 The main monetary policy transmission channels involving banks



Source: ECB.

ultimately leading to lower aggregate demand by reducing investment and consumption. This mechanism, however, is not the focus of this article, even though it is probably the most important channel of monetary policy.

Monetary policy may also influence the ability of, and incentives for, banks to supply loans through the functioning of the so-called credit channel. In a frictionless financial system, all the projects with a positive net present value would be financed, irrespective of the net worth of the borrower(s) and/or lender(s). However, frictions in financial markets, such as asymmetries of information and incompleteness of contracts, imply that – on account of, for example, moral hazard problems – lenders will not always finance projects with a positive net present value. In such cases, the net worth of the borrower(s) and/or lender(s) is of importance for loan supply, and monetary policy can affect it.<sup>6</sup> This, in turn, has an influence on real economic activity and inflation, especially in the euro area where banks are the key suppliers of external finance for the non-financial private sector.

The credit channel of monetary policy transmission is composed of two sub-channels (see Chart 4). In the first, the bank lending channel, a change in monetary policy rates affects the liability side of banks' balance sheets. This, in turn, triggers adjustments on the asset side through changes in the banks' loan portfolios.<sup>7</sup> Since banks finance themselves largely through short-term debt and deposits, a tightening of monetary policy would tend to reduce loan supply, via its negative impact on the availability of funds for banks. This effect rests on the assumption that banks are not able to perfectly replace short-term debt and deposits with funding from other sources, or that they do not have sufficient liquidity buffers.<sup>8</sup>

Moreover, an increase in short-term rates can increase the external finance premium for banks (i.e. the premium over the risk-free rate paid to outside investors) by potentially reducing the net worth of banks' assets and by increasing their risk burden. This would also affect loan supply.<sup>9</sup>

In this sense, the bank lending channel includes the impact of monetary policy, as channelled through banks' capital position, also referred to as the bank capital channel.<sup>10</sup> By way of their impact on bank balance sheet valuations and overall bank profitability, monetary policy rates affect banks' capital position, thus inducing banks to adjust loan supply to meet targeted leverage and capital ratios, as well as regulatory capital requirements. Therefore, the effect of monetary policy on bank loan supply will depend on the liquidity and capital positions of banks, as well as on the size and the maturity structure of their liabilities.<sup>11</sup>

The second mechanism belonging to the credit channel of monetary policy transmission, the balance sheet channel, works through changes to the quality of borrowers (see Chart 4).

- 6 See B.S. Bernanke and M. Gertler, "Inside the black box: the credit channel of monetary policy transmission", *Journal of Economic Perspectives*, Vol. 9, No 4, autumn 1995, pp. 27-48; and B.S. Bernanke, "The Financial Accelerator and the Credit Channel", speech presented at the conference entitled "The Credit Channel of Monetary Policy in the Twenty-first Century", Federal Reserve Bank of Atlanta, 2007. See also J.E. Stiglitz and B. Greenwald, *Towards a New Paradigm in Monetary Economics*, Cambridge University Press, 2003.
- 7 See for example B.S. Bernanke and A. Blinder, "Credit, money, and aggregate demand", *American Economic Review*, 78, No 2, May 1988, pp. 901-921; D.W. Diamond and R.G. Rajan, "Money in a Theory of Banking", *American Economic Review*, 96, 2006, pp. 30-53; and J.C. Stein, "An Adverse-Selection Model of Bank Asset and Liability Management with Implications for the Transmission of Monetary Policy", *RAND Journal of Economics*, No 29, 1998, pp. 466-486.
- 8 See T. Adrian and H. Shin, "Money, Liquidity and Monetary Policy", *American Economic Review*, Papers and Proceedings, Vol. 99(2), 2009.
- 9 See Bernanke (2007), op. cit.
- 10 The assumption for the "bank capital" channel to work is that the market for bank equity is imperfect (in the sense that imperfect information, especially when financing conditions are more restrictive, makes it difficult for banks to raise new equity); see, for example, S. Van den Heuvel, "Does bank capital matter for monetary transmission?", *Economic Policy Review*, Federal Reserve Bank of New York, May 2002, pp. 259-265; R.P. Kishan and T.P. Opiela, "Bank capital and loan asymmetry in the transmission of monetary policy", *Journal of Banking & Finance*, No 30, 2006, pp. 259-285; and Y. Altunbas, G. de Bondt and D. Marqués, "Bank capital, bank lending, and monetary policy in the euro area", *Kredit und Kapital*, Vol. 37(4), 2004, pp. 443-464.
- 11 See, for example, A.N. Kashyap and J. Stein, "What do a million observations on banks say about the transmission of monetary policy?", *American Economic Review*, Vol. 90, No 3, June 2000, pp. 407-428. See also W.J. Den Haan, S. Sumner and G. Yamashiro, "Bank Loan Portfolios and the Monetary Transmission Mechanism", *Journal of Monetary Economics*, Vol. 54, 2007, pp. 904-924.

Changes in policy rates may affect borrowers' net worth via the impact on cash flows and collateral values. The external finance premium paid by borrowers depends inversely on their net worth. When borrowers have little capital to contribute to the financing of a project, the conflict of interests between the borrower and the suppliers of external funds is potentially larger, which translates into higher compensation to be paid to external investors. Moreover, borrowers' net worth is typically pro-cyclical (because profits and asset prices tend to be pro-cyclical) and, therefore, the external finance premium is counter-cyclical. This amplifies the impact of changes in short-term rates on credit availability, and thus on investment, consumption, and production – a mechanism referred to as the financial accelerator.<sup>12</sup> Hence, the effect of monetary policy on bank loan supply depends on the borrowers' net worth (capital ratio, liquidity ratio, size and tangible assets).<sup>13</sup>

The (firm) balance sheet and the bank lending channels are interrelated. A tightening of monetary policy reduces the net worth of borrowers, which, in turn, decreases the net worth of banks via an increase in the credit risk of their loan books. In addition, restrictions on bank loan supply may reduce the net worth of borrowers as a result of the higher cost of capital and/or the reduction of the credit effectively granted.

More recently, the notion of a “risk-taking” channel of monetary policy transmission has been put forward.<sup>14</sup> Low short-term interest rates may increase risk-taking by banks through several mechanisms. First, low levels of interest rates – policy rates and government bond yields – may increase the attractiveness of risky assets for all investors, including banks. This effect can be seen in models of portfolio optimisation in a mean-variance analysis framework, or in models including habit formation. Investors may become less risk-averse during economic expansions because their consumption increases relative to the status quo (normal levels). Less tight monetary

policy conditions may decrease investors' risk aversion by supporting real economic activity.<sup>15</sup> Second, when interest rates are low and liquidity is abundant, financial intermediaries may “over-lend” and finance projects with sub-optimal net present values because of conflicts of interests that arise from asymmetric information, which is often pervasive in the banking industry.<sup>16</sup> In fact, the level of overnight rates is a key driver of liquidity for banks, since banks increase their balance sheets (leverage) when financing conditions (through short-term debt) are more favourable, and vice versa.<sup>17</sup> Therefore, low short-term interest

12 See B.S. Bernanke, M. Gertler and S. Gilchrist, “The financial accelerator in a quantitative business cycle framework”, in J. Taylor and M. Woodford (eds.), *Handbook of Macroeconomics*, Amsterdam, 1999; J.E. Stiglitz and A. Weiss, “Credit rationing in markets with imperfect information”, *American Economic Review*, Vol. 71, No 3, June 1981, pp. 393-410; and B. Holmström and J. Tirole, “Financial intermediation, loanable funds, and the real sector”, *The Quarterly Journal of Economics*, Vol. 112, No 3, 1997, pp. 663-691.

13 See B.S. Bernanke, M. Gertler, and S. Gilchrist, “The Financial Accelerator and the Flight to Quality”, *Review of Economics and Statistics*, 78, 1996, pp. 1-15; and A. Ashcraft and M. Campello, “Firm balance sheets and monetary policy transmission”, *Journal of Monetary Economics*, Vol. 54, 2007, pp. 1515-1528.

14 See, for example, C. Borio and H. Zhu (2008), op. cit.

15 See J. Campbell and J. Cochrane, “By force of habit: a consumption-based explanation of aggregate stock market behaviour”, *Journal of Political Economy*, Vol. 107, 1999, pp. 205-251; S. Manganello and G. Wolswijk, “Market discipline, financial integration and fiscal rules – what drives spreads in the euro area government bond market?”, *Working Paper Series*, No 745, ECB, 2007; and B.S. Bernanke and K.N. Kuttner, “What explains the stock market's reaction to Federal Reserve policy?”, *The Journal of Finance*, Vol. 60, No 3, June 2005, pp. 1221-1257. For a discussion of the search for yield associated with low levels of interest rates, see R.G. Rajan, “Has Finance Made the World Riskier?”, NBER Working Paper 11728 and paper presented at the symposium sponsored by the Federal Reserve Bank of Kansas City, Jackson Hole, 2005.

16 See F. Allen and D. Gale, *Understanding Financial Crises*, Oxford University Press, 2007; and F. Allen and D. Gale, “Asset price bubbles and monetary policy” in M. Desai and Y. Said (eds.), *Global Governance and Financial Crises*, 2004. Without bank agency problems, banks would, in the event of having excess liquidity, give funds back to their shareholders or the central bank. See also G. Dell'Ariccia and R. Marquez, “Lending Booms and Lending Standards”, *Journal of Finance*, No 61(5), 2006, pp. 2511-2546, and Diamond and Rajan (2006), op. cit.

17 See H. Shin, *Risk and liquidity*, 2008 Clarendon Lectures in Finance, Oxford University Press, forthcoming; and M. Brunnermeier, A. Crockett, C. Goodhart, A. Persaud and H. Shin, “The Fundamental Principles of Financial Regulation”, *Geneva Reports on the World Economy*, 11, 2009.

rates may increase bank risk-taking through these channels.<sup>18</sup>

Overall, there are several theoretical mechanisms by which monetary policy may affect the supply of loans that banks are willing and able to provide to firms and households. Given that, in the euro area, banks are the key suppliers of external finance for firms and households, changes in bank loan supply may, in turn, affect economic activity. Hence, the transmission of monetary policy through the credit and risk-taking channels may potentially amplify the monetary policy implications for output and inflation that emanate from the impact on demand via the interest rate channel.

### 3 EMPIRICAL EVIDENCE ON THE CREDIT AND RISK-TAKING CHANNELS IN THE EURO AREA

This section presents an overview of empirical evidence for the euro area on the impact of monetary policy on bank loan supply and, ultimately, on economic activity. More specifically, it provides indications for the different channels of monetary policy transmission discussed above, with a focus on the euro area.

The empirical findings are divided into three parts: first, the monetary policy impact on banks' own balance sheets and loan supply is examined. Second, the monetary policy impact on borrower balance sheets and loan supply is analysed. Third, the impact of changes in loan supply on economic activity and inflation is assessed. These findings help address one of the key challenges faced by central banks in gauging the impact of monetary policy on loan supply, namely disentangling loan supply and demand effects as precisely as possible. Empirically, it is difficult to identify supply effects using aggregate time series. Therefore, individual bank-specific characteristics are often used in the empirical literature to identify factors that directly influence loan supply, while demand for loans is typically assumed to be independent of the situation of individual

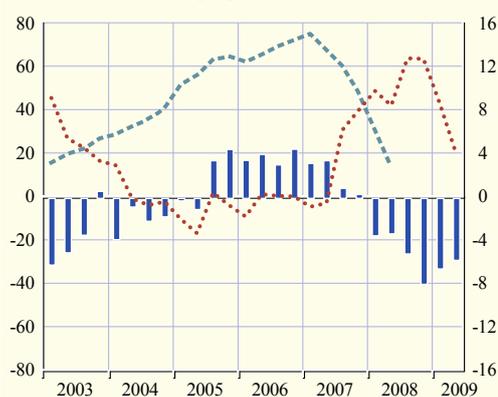
banks and to rather depend on macroeconomic factors. In addition to using such micro-based evidence, use is also made in this article of responses to the Eurosystem bank lending survey for the euro area, which include information on euro area banks' assessments of loan supply and demand conditions and which thus allow a potential identification of supply-side effects at the more aggregate euro area level also. As illustrated in Charts 5 and 6, which include information from the aforementioned survey, bank lending tends to be highly positively correlated with changes in loan demand and negatively correlated with changes in bank credit standards (that broadly reflect bank supply conditions). Using these survey data for identification, however, implies some general qualifications as they are restricted to qualitative information and, thereby, subjective by nature, with the potential

<sup>18</sup> Securitisation of loans also increases bank liquidity, and results in assets yielding attractive returns for investors. At the same time, it may induce reduced screening and monitoring of securitised loans. Hence, the impact of low rates on bank risk-taking may be stronger with high securitisation activity (see Rajan (2005), *op. cit.*).

Chart 5 Lending to non-financial corporations in the euro area

(annual percentage changes; net percentages)

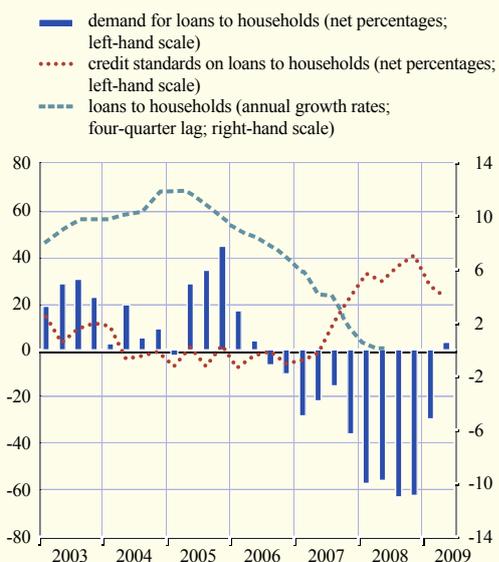
■ demand for loans to enterprises (net percentages; left-hand scale)  
 ..... credit standards on loans to enterprises (net percentages; left-hand scale)  
 - - - loans to non-financial corporations (annual growth rate; four-quarter lag; right-hand scale)



Source: ECB.

**Chart 6 Lending to households for house purchase in the euro area**

(annual percentage changes; net percentages)



Source: ECB.

for an endogenous link between responses that relate to credit demand and those that refer to credit supply.<sup>19</sup> Furthermore, in the case of the bank lending survey, the time horizon of the data available is still limited, as the first survey round only took place in the fourth quarter of 2002.

### MONETARY POLICY IMPACT ON BANK BALANCE SHEETS AND LOAN SUPPLY

The issue of the extent to which monetary policy impacts on bank loan supply is typically analysed in terms of the credit and risk-taking channels of monetary policy transmission (see Section 2). In this respect, it is useful to distinguish between the “traditional” bank lending channel (working through the availability of funds), a bank capital channel (via the impact on banks’ profitability and capital position), the balance sheet channel (relating to the net worth of the bank borrowers) and the risk-taking channel (working through banks’ risk perceptions). The empirical evidence for the euro area with respect to these four channels is presented hereafter.

As regards the “traditional” bank lending channel, where a change in monetary policy rates that affects the banks’ liabilities can be expected to have an impact on the banks’ ability to lend, the empirical evidence for the euro area is rather mixed.<sup>20</sup> Early evidence on the importance of the bank lending channel in the euro area countries was provided by the results of studies by the Eurosystem Monetary Transmission Network (MTN).<sup>21</sup> Somewhat in contrast to evidence for the United States, the MTN found that the features of the banking sector in many euro area countries to some extent sheltered banks from the effects of monetary policy on their funding, and thus on their ability to lend. For example, the partial public involvement in national banking sectors, extensive deposit insurance schemes, the existence of bank network arrangements and the prominence of relationship lending were assessed to be weakening the importance of the bank lending channel in many euro area countries. According to the MTN results, only the degree of bank liquidity was found to significantly interact with monetary policy in the sense that less liquid banks were more prone to change their lending in response to changes in monetary

19 When looking at the survey responses on the factors contributing to the tightening of credit standards, this qualification holds true particularly for risk-related factors that reflect the assessment of the creditworthiness of borrowers.

20 By contrast, earlier evidence in favour of the bank lending channel was found for the United States, using micro-econometric modelling approaches. In particular, it was found that monetary policy had distributional effects across banks with different degrees of informational opaqueness (as measured by, for example, size, liquidity and capital); see, for example, J. Peek and E.S. Rosengren, “Bank lending and the transmission of monetary policy”, in J. Peek and E.S. Rosengren, (eds.), *Is Bank Lending Important for the Transmission of Monetary Policy?*, Federal Reserve Bank of Boston Conference Series 39, 1995, pp. 47-68; Kashyap and Stein (2000), *op. cit.* A related study using a different modelling approach was undertaken by J.C. Driscoll, “Does bank lending affect output? Evidence from the U.S. states”, *Journal of Monetary Economics*, Vol. 51, 2004, pp. 451-471. For similar findings, see also A. Ashcraft, “New evidence on the lending channel”, *Journal of Money, Credit, and Banking*, Vol. 38(3), 2003, pp. 751-776.

21 See, in particular, M. Ehrmann, L. Gambacorta, J. Martínez Pagés, P. Sevestre and A. Worms, “Financial systems and the role of banks in monetary policy”, in I. Angeloni, A.K. Kashyap and B. Mojon (eds.), *Monetary Policy Transmission in the Euro Area*, Cambridge University Press, Cambridge, 2003, and the companion papers cited therein.

policy. More recently, the growing importance of non-deposit funding sources, such as capital market financing (e.g. covered bond issuance) and the rapid expansion of the euro area securitisation market, has also tended to further weaken the bank lending channel. In this regard, Box 1 examines the role of financial innovation in the monetary policy transmission mechanism, also taking into account the effects of the financial turmoil. Nonetheless, whereas the MTN studies were conducted mainly on the basis of data samples covering the period prior to the introduction of the euro, more recent

studies using data covering the period since the start of Stage Three of EMU have found some evidence of a functioning bank lending channel among euro area countries.<sup>22</sup>

22 Using the approach of Driscoll (op. cit.) for a panel of euro area countries, the studies find that money demand shocks have a significant effect on bank lending (and, in contrast to Driscoll's findings, also on economic activity); see L. Cappiello, A. Kadareja, C. Kok Sørensen and M. Protopapa, "Do bank loans and credit standards have an effect on output? A panel approach for the euro area", *Working Paper Series*, ECB, forthcoming; and M. Čihák, and P.K. Brooks, "From subprime loans to subprime growth? Evidence for the euro area", *IMF Working Paper Series*, No 09/69, International Monetary Fund, 2008.

## Box

### TAKING STOCK OF THE IMPACT OF FINANCIAL INNOVATION ON BANK LOAN SUPPLY IN THE LIGHT OF THE FINANCIAL TURMOIL

The years prior to the credit market turmoil coincided with spectacular increases in the amount and complexity of securitisation activity, and in the number of countries using structured finance products. While securitisation has been in use as a funding technique for more than 50 years in the United States, a significant use of securitisation in the euro area has only taken place in recent years.<sup>1</sup> The large increases in the use of securitisation across the globe were part of a wider trend of financial innovation towards the structuring and trading of credit risk.<sup>2</sup> Together, these developments helped to make credit risk more tradable. This trend also encompassed the development of credit derivatives and the frequent use of securitisation techniques, in combination with more traditional forms of transferring credit risk, such as the syndication of loans. This revolution in credit risk transfer techniques can be traced back to a number of concurrent factors, such as globalisation in financial markets, improvements in information technology and pricing models, as well as the movement towards a more market-based financial system. In Europe, the disappearance of exchange rate risk among euro area countries, the increase in financial integration and a more market-based financial system all contributed to enhancing the liquidity and size of the securitisation market.

The recent financial market crisis has had a huge impact on the securitisation markets. In this respect, even though securitisation activity in the primary markets has remained robust, the bulk of the thus securitised instruments is retained within the originators' balance sheets. The primary market for public securitisation was very weak and almost ground to a halt in most of 2008 and in the first half of 2009, while some activity remains in the secondary market. Indeed, evidence from the bank lending survey for the euro area in recent quarters suggests that problems in accessing securitisation markets are having an impact on banks' willingness and ability to lend.

1 For an explanation of securitisation in the euro area, see the article entitled "Securitisation in the euro area" in the February 2008 issue of the Monthly Bulletin.

2 D. Marqués-Ibáñez and M. Scheicher, "Securitisation: Causes and Consequences", in A. Berger, P. Molyneux and J. Wilson (eds.), *Handbook of Banking*, Oxford University Press, forthcoming.

This is likely to also be the case in the near future, given a dislocated investor base that suffered very heavy losses during the financial crisis, the high level of uncertainty and an excess pre-crisis supply.

These developments in securitisation activity have produced significant changes both in the financial structure of most developed countries and in the role of banks therein. In this respect, the use of securitisation prior to the financial crisis modified the functioning of credit markets, reducing the fundamental role of liquidity transformation traditionally performed by financial intermediaries. The changing role of banks from that of “originating and holding” to one of “originating, repackaging and selling” also had implications for the incentives and ability of banks to grant credit. Indeed, from a macroeconomic perspective, securitisation brought about significant changes in the credit markets, thereby altering loan dynamics. In this respect, one of the consequences of securitisation from a macroeconomic perspective was an overall increase in the aggregate loan supply. This was due to the characteristics of securitisation activity that releases previously illiquid parts of the credit spectrum, thereby encouraging a larger mobilisation of funds from investors. Furthermore, by fully removing loans from their balance sheet, banks were often able to obtain regulatory capital relief, which could also be used to expand loan supply. From a microeconomic point of view, the ability to securitise part of their assets gave banks access to additional funding that could, in turn, be used to grant additional loans. Recent studies suggest that the expansion of credit supply in recent years was partly driven by securitisation. In particular, there is evidence that credit growth is higher in those areas experiencing larger increases in securitisation activity and that banks that are more active in the securitisation market also seem to supply more loans.<sup>3</sup>

In addition, securitisation may have altered the monitoring function performed by banks.<sup>4</sup> By moving instruments from banks’ balance sheets to the markets, there may have been fewer incentives for financial intermediaries to screen borrowers. This is consistent with recent evidence suggesting that securitisation might have led to looser lending standards.<sup>5</sup> By making banks more dependent on market funding, securitisation could strengthen the connections between banks’ lending, banks’ funding and systemic developments in financial markets. As a result, banks’ incentives and abilities to lend are expected to depend on financial market conditions to a larger extent than in the past when banks were overwhelmingly funded via bank deposits. This is mainly because deposits tend to have a more stable remuneration and are, by definition, less dependent on financial market conditions than tradable instruments. Overall, under more extreme circumstances, securitisation could have a significant impact on the banking sector’s ability to grant credit.

The return of a robust securitisation market, however, is expected to take a very different form to that seen in the pre-crisis period. In particular, a sharp reduction in the level of complexity and leverage of the instruments issued is anticipated in a more regulated market. In this respect, a higher level of transparency and more aligned incentives are crucial for an efficient securitisation market.

3 A. Sufi and A. Mian, “The consequences of mortgage credit expansion: evidence from the U.S. mortgage default crisis”, *Quarterly Journal of Economics*, Vol. 124(4), 2009; and Y. Altunbas, L. Gambacorta and D. Marqués-Ibáñez, “Securitisation and the bank lending channel”, *European Economic Review*, forthcoming.

4 See B. Holmström and J. Tirole, “Financial intermediation, loanable funds, and the real sector”, *The Quarterly Journal of Economics*, Vol. 112(3), 1997, pp. 663-691; and A. Ashcraft and T. Schuermann, “The seven deadly frictions of subprime mortgage credit securitization”, *The Investment Professional*, autumn 2008.

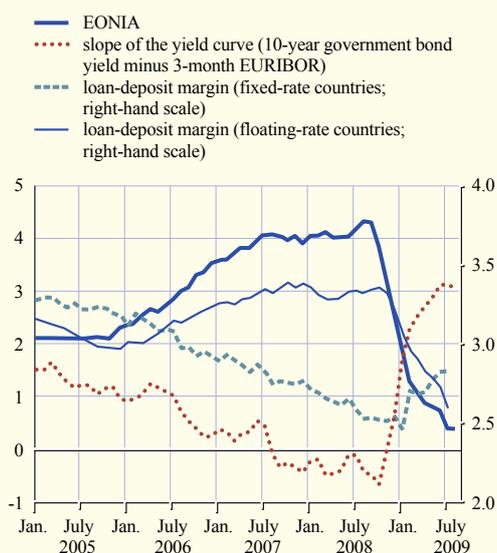
5 B. Keys, T. Mukherjee, A. Seru and V. Vig, “Did securitization lead to lax screening? Evidence from subprime loans 2001-2006”, *The Quarterly Journal of Economics*, Vol. 125(1), 2010.

Turning to the bank capital channel as part of the broader definition of the bank lending channel, there is some empirical evidence suggesting that euro area banks with low capitalisation are more sensitive to changes in monetary policy than banks which are well-capitalised.<sup>23</sup> A recent study examines the importance of monetary policy for bank profitability in the euro area, distinguishing between the different elements of bank earnings.<sup>24</sup> First, the nature of the impact of monetary policy on banks' net interest income, via its effect on the level of short-term interest rates and the slope of the yield curve, hinges crucially on the respective bank's business model. In particular, it brought to light the fact that traditional banks, i.e. banks characterised by operations with a maturity mismatch in the sense of lending long term and funding short term, are most strongly affected by monetary

policy. Thus, it is of relevance whether banks lend predominantly at floating rates or at fixed rates. In fact, there are considerable differences across euro area countries as regards the typical initial rate fixation period of bank loans. For example, it is found that a reduction of policy rates and a steepening of the yield curve have a positive impact on the banks' net interest income in countries where banks lend mainly at fixed long-term rates, whereas the opposite effect is found in countries where banks lend to a larger degree at floating and short-term rates (see Chart 7). Second, as a consequence of its effects on asset prices, a reduction in policy rates tends to have positive valuation effects on the banks' trading books. A third finding is that, by impacting on the collateral values and the cash flows of bank borrowers, the policy-induced changes in asset prices in turn affect the level of write-offs in banks' loan books, as well as the loan loss provisions that banks will have to make.

Chart 7 MFI loan-deposit margins and the yield curve

(percentages per annum; percentage points)



Sources: ECB and Reuters.

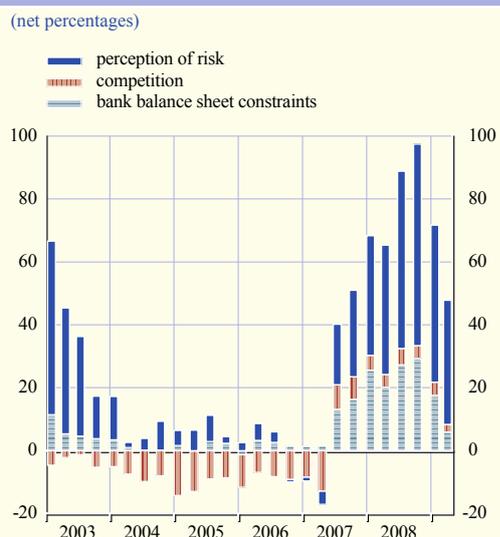
Notes: The category "fixed-rate countries" comprises Belgium, Germany, France and the Netherlands, and are defined as countries where more than 50% of the mortgage loans are at interest rates fixed for an initial period of more than five years. The category "floating-rate countries" consists of the remaining euro area countries. See also ECB, "Differences in MFI interest rates across euro area countries", September 2006.

Monetary policy-induced changes to banks' balance sheets, as well as other shocks that affect bank soundness, may cause banks to alter their loan supply. This can be reflected in the credit volumes made available by the banks, as well as in the terms and conditions stipulated for credit. By way of illustration, Chart 8 shows that, in certain periods, bank balance sheet constraints have contributed to a significant net tightening of bank credit standards, most notably during the recent

23 See, for example, Y. Altunbas, G. de Bondt and D. Marqués-Ibáñez, *op. cit.*; L. Gambacorta and P.E. Mistrulli, "Does bank capital affect lending behaviour?", *Journal of Financial Intermediation*, Vol. 13(4), 2004, pp. 436-457; for US-based evidence, see, for example, R.P. Kishan and T.P. Opiela, "Bank capital and loan asymmetry in the transmission of monetary policy", *Journal of Banking and Finance*, Vol. 30, 2006, pp. 259-285; and T. Bayoumi and O. Melander, "Credit Matters: Empirical Evidence on U.S. Macro-Financial Linkages", *IMF Working Paper Series*, No 08/169, International Monetary Fund, 2008; for Japan, see, for example, W. Watanabe, "Prudential Regulation and the 'Credit Crunch': Evidence from Japan", *Journal of Money, Credit and Banking*, Vol. 39, No 2-3, 2007, pp. 639-665.

24 See H.S. Hempell and C. Kok Sørensen, "Does monetary policy affect bank profitability and bank loan supply? Empirical evidence for the euro area", *Working Paper Series*, ECB, forthcoming.

**Chart 8 Factors contributing to changes in credit standards on loans to enterprises**



Sources: Eurosystem bank lending survey and ECB calculations.  
 Notes: The “perception-of-risk” factor refers to the “industry and firm-specific outlook”, the “expectations regarding general economic activity”, and the “risk on collateral demanded”; the “competition” factor refers to competition from “other banks”, “non-banks” and “market financing”; the “balance-sheet-constraints” factor refers to “costs related to banks’ capital position”, “banks’ ability to access market financing” and “banks’ liquidity position”. The net percentages reported for the three groups of contributing factors are simple averages of the underlying factors listed above.

financial crisis.<sup>25</sup> Indeed, a recent study<sup>26</sup> exploiting information from the bank lending survey in a country-panel estimation approach provides evidence of the importance of balance sheet constraint factors for bank lending. These factors, as taken from the bank lending survey, can be interpreted as “pure” credit-supply effects since they focus exclusively on factors inherent to the respective banks, whereas the bank lending survey factors concerning banks’ perceptions of risks that contribute to a tightening of credit standards relate to borrowers’ quality, i.e. to the firms’ balance sheet channel as described above, and are thereby only indirectly linked to the banks’ own situation.

Supply-side constraints in a narrower sense, more specifically “costs related to banks’ capital position”, are found to be particularly important in the case of corporate lending. They have a significant negative impact on the growth rate

of banks’ lending to non-financial corporations, even after controlling for various demand-side factors (including the banks’ perceptions of demand, as also reported in the bank lending survey).<sup>27</sup> The estimates with respect to loans to non-financial corporations suggest that a net tightening of credit standards on account of the banks’ cost of capital would result in some decline in the quarterly growth rate of bank lending to non-financial corporations. Furthermore, higher industry and firm-specific risk perceptions by banks, as taken from the bank lending survey, impact negatively on overall bank lending to non-financial corporations even when controlling additionally for changes in loan demand as perceived by the banks participating, according to the responses to a separate question in the survey. This supports the assumption of these effects being attributable to the supply side of bank lending, reflecting the impact of a borrower balance sheet channel and increased risk aversion of banks.

In the case of lending to households for house purchase, the impact of “pure” supply-side constraints is less clear-cut when similar estimation techniques are employed. There seems to be far stronger evidence for primarily demand-driven development, particularly when information on loan demand is included, as is provided by the bank lending survey in responses to a separate question. Furthermore, as regards recent developments in the period of turmoil, the tightening of credit standards for housing loans indicates that there was less pressure on the development of housing loans from the supply side than in the case of loans to non-financial corporations (see Charts 5 and 6).

25 Empirical evidence on the importance of capital constraints for loan supply in terms of the tightening of banks’ lending standards for the euro area is provided in A. Maddaloni, J.L. Peydró and S. Scopel, “Does monetary policy affect bank credit standards?”, paper presented at the CEPR/ESI 12th Annual Conference on the Evolving Financial System and the Transmission Mechanism of Monetary Policy, Basel, September 2008; and Hempell and Kok Sørensen (2009), op. cit.; for the United States, see, for example, T. Bayoumi and O. Melander (2008), op. cit.  
 26 See H.S. Hempell and C. Kok Sørensen, “The impact of supply constraints on bank lending in the euro area”, *Working Paper Series*, ECB, forthcoming.  
 27 This finding is in line with the findings of studies exploring the importance of capital on banks’ lending decisions, as cited above.

## MONETARY POLICY IMPACT ON BORROWERS' BALANCE SHEETS AND LOAN SUPPLY

Regarding the balance sheet channel, where monetary policy is deemed to impact on bank loan supply via its effect on the net worth of borrowers' balance sheets, recent empirical evidence based on the analysis of loan applications from firms points to the existence of this mechanism.<sup>28</sup> Data on loan applications allow the questions of whether and why banks grant loans to be analysed and help to disentangle the impact arising from loan supply from that of loan demand. The empirical evidence suggests that the probability of banks granting loans to firms with higher leverage and lower liquidity ratios increases when monetary policy rates decline. The associated increase in the loan volume may have a positive influence on economic activity, given the key importance of banks as suppliers of external finance, especially in the euro area. In addition, if the more capital-constrained firms belong to sectors with higher productivity (e.g. biotech firms), the induced change in the composition of bank loan portfolios may spur economic growth even more.<sup>29</sup> Hence, monetary policy may influence economic activity not only by changing bank loan volumes, but also by affecting the composition of bank loans.

In the framework of the balance sheet channel of monetary policy transmission, lower policy rates do not imply that banks are taking higher risks, since borrowers' net worth tends to increase when short-term interest rates are lower, for example through higher values of collateral. In this context, banks lend to firms with an improved financial position, which are therefore less risky.

Recent empirical evidence, however, suggests that low short-term rates may also induce banks to grant loans with a higher actual risk (a mechanism labelled the "risk-taking channel", as outlined in Section 2) when risk is measured by ex ante credit standards or by default probabilities. When short-term interest rates are low, banks tend to soften their credit standards

and the originated loans tend to have a high default risk. In addition, banks with relatively low capital engage in more risk-taking, and the interest rate spreads on such loans do not account for the high credit risks taken.<sup>30</sup> The impact of low short-term interest rates may also be strengthened when banks engage in large-scale securitisation activity. All these effects are present when improvements in borrowers' collateral risk and value are taken into account, thus suggesting that banks take more risk when short-term interest rates are low.<sup>31</sup>

## IMPACT OF BANK LOAN SUPPLY ON ECONOMIC ACTIVITY

The final part of this article investigates the linkages between the banking sector and the real economy. In particular, it analyses the impact of loan supply restrictions on economic activity and inflation. For the credit and risk-taking channels to be operative, bank loan supply should ultimately affect economic activity and

28 See G. Jiménez, S. Ongena, J.L. Peydró, and J. Saurina, "Identifying loan supply and balance-sheet channels with loan applications", paper presented at the Fourth BI-CEPR Conference on Money, Banking and Finance: Corporate Governance, Capital Structure and Firm Performance, Rome, October 2009.

29 See K. Matsuyama, "Credit Traps and Credit Cycles," *American Economic Review*, 2007, 97(1), pp. 503-16.

30 See G. Jiménez, S. Ongena, J.L. Peydró, and J. Saurina, "Hazardous Times for Monetary Policy: What Do Twenty-Three Million Bank Loans Say About the Effects of Monetary Policy on Credit Risk-Taking?", paper presented at the American Finance Association Meetings, San Francisco, 2009; V. Ioannidou, S. Ongena and J.L. Peydró, "Monetary policy, risk-taking and pricing: evidence from a natural experiment", paper presented at the NBER Summer Institute, Cambridge, MA, 2009; A. Maddaloni and J.L. Peydró, "Bank risk-taking, securitisation, supervision and low interest rates", paper presented at the conference entitled "The Financial Crisis", New Haven, CT, 2009; Maddaloni et al. (2009), op. cit.; and Marqués-Ibáñez et al. (2009), op. cit. They all show that bank risk matters for monetary policy. When short-term interest rates are lower, the reduction of spreads is not unique to loans, but also holds true for equity and bond spreads. For effects of short-term interest rates on the pricing of equity, see, for example, Bernanke and Kuttner (2005), op. cit.; for the effects on the pricing of bonds, see Manganelli and Wolswijk (2007), op. cit. As explained in Section 2, low levels of interest rates may induce a search for yield (see Rajan (2005), op. cit.). Securitised loans provide assets with attractive yields, but owing to a reduced screening and monitoring of securitised loans by banks, the interaction between low policy rates and high securitisation may imply softer lending standards by banks (see A. Mian and A. Sufi (2009), op. cit.).

31 See Maddaloni and Peydró (2009), op. cit.

inflation. This would apply if companies and consumers cannot perfectly replace bank loans with other means of financing, such as bonds or equities. However, while the theoretical mechanisms have been discussed and analysed in depth, empirical evidence supporting these mechanisms, and estimates of the economic significance of the effects involved, remains a challenge for researchers.

There are different empirical approaches that can be used to analyse this impact. For the euro area, two recent studies based on panel econometric techniques using country-based macroeconomic data find that changes in credit supply have a non-negligible impact on real economic activity in the region.<sup>32</sup> These findings continue to hold true even when controlling for bank credit standards on lending as reported in the bank lending survey.

Lending standards can also be used directly as a measure of credit supply in the economy.<sup>33</sup> Indeed, credit standards from bank lending surveys have predictive power for future developments in credit and economic growth. This has been shown for the United States where longer time series are available, and more recently also for the euro area.<sup>34</sup> This suggests that the credit standards applied to borrowers affect the actual credit granted by banks, in turn influencing economic activity.

Survey answers related to the factors affecting loan supply provide a simple and intuitive way of distinguishing the different mechanisms of monetary policy transmission. In particular, the mechanisms of transmission related to the bank lending channel and the balance sheet channel can be identified using the answers from the survey related to bank balance sheet constraints and risk perceptions related to borrower collateral and outlook. Ultimately, the relative impact on real economic activity and prices can be assessed as well. In addition, bank lending surveys contain explicit information on reported demand for loans to firms and loans to households.

A vector autoregression (VAR) methodology provides a useful empirical framework for analysing these mechanisms.<sup>35</sup> The derived impulse response functions are a simple tool to illustrate the dynamic impact arising from a shock to one of the variables, and thus allow the question to be analysed as to whether a tightening in loan supply has a dampening impact on economic activity. Chart 9 plots the responses of GDP and a price index to a tightening of credit standards for all kinds of loans, as measured by the bank lending survey. In this context, the tightening implies restrictions on all types of terms and conditions for a loan (loan margins, volume, maturity and collateral requirements). GDP declines in response to tightened supply conditions. The impact is similar for restrictions on loan supply to non-financial corporations and mortgage loans, while it is not significant for consumer loans. This latter result may reflect the low relative importance that this segment of the credit market has in most euro area countries, despite the significant rates of increase recorded over the last few years.<sup>36</sup> The effect of supply restrictions on GDP reaches a peak after around one year and fades away after around three years.

32 See Capiello et al., op. cit., and Čihák and Brooks (2008), op. cit.

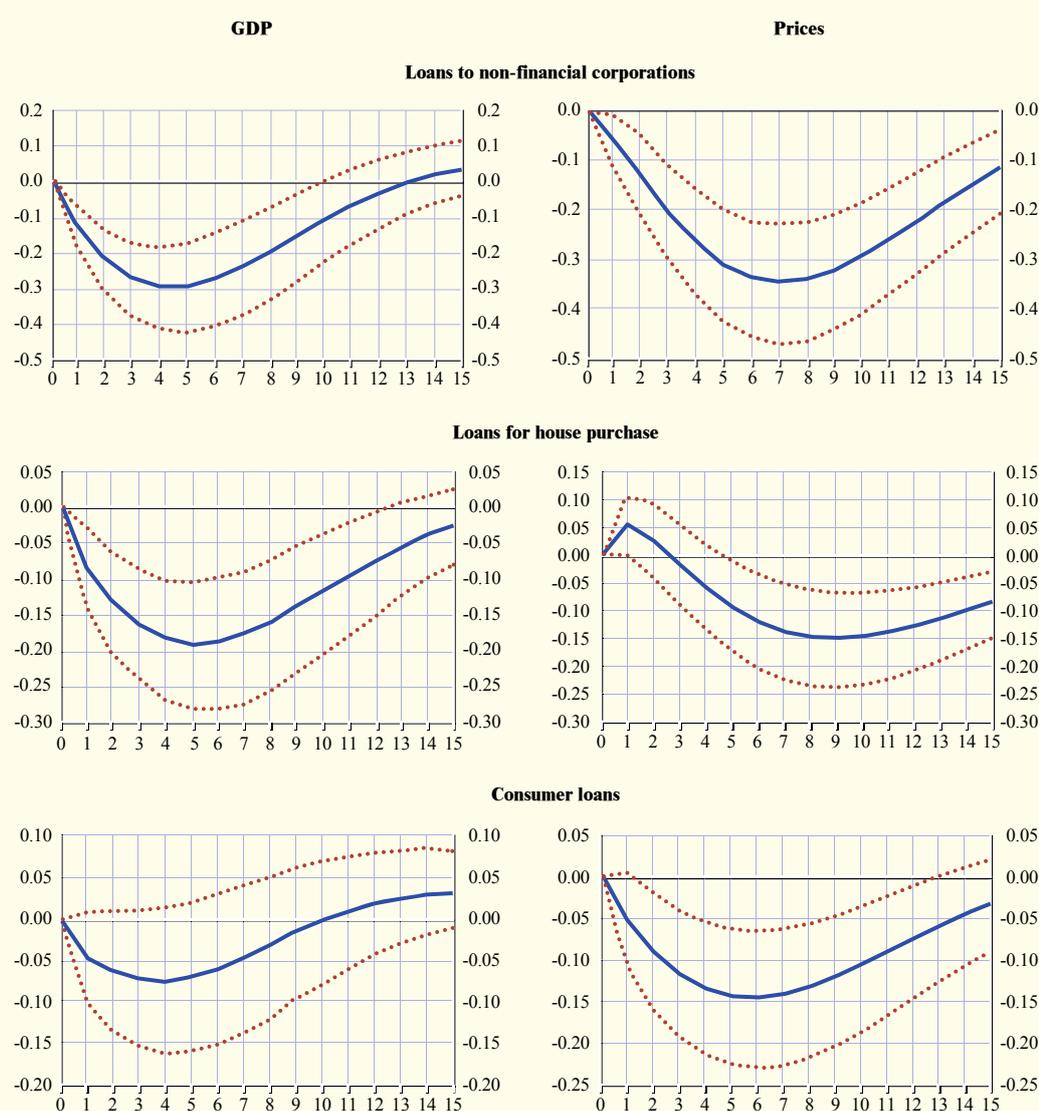
33 For US evidence, see, for example, Bayoumi and Melander (2008), op. cit., and A. Swiston, "A U.S. Financial Conditions Index: Putting Credit Where Credit is Due", *IMF Working Paper Series*, 08/161, International Monetary Fund, 2008.

34 For US evidence, see C. Lown and D.P. Morgan, "The Credit Cycle and the Business Cycle: New Findings Using the Loan Officer Opinion Survey", *Journal of Money, Credit and Banking*, Vol. 38, No 6, September 2006, pp. 1575-1597. For euro area evidence, see G. de Bondt, A. Maddaloni, J.L. Peydró and S. Scopel, "The bank lending survey matters: first empirical evidence for euro area credit and output", *Working Paper Series*, ECB, forthcoming.

35 For details, see M. Ciccarelli, A. Maddaloni and J.L. Peydró, "Trusting the Bankers: a New Look at the Credit Channel of Monetary Transmission", paper presented at the C.R.E.D.I.T. conference, Venice, September 2009. The panel VAR for the euro area includes GDP, prices, short-term interest rates, loan demand (proxied by the changes in demand volume from the bank lending survey) and loan supply conditions (proxied by the changes in credit standards from the bank lending survey).

36 Consumer loans account for less than 10% of total loans outstanding in the euro area.

Chart 9 Response of GDP and prices to credit supply restrictions



Source: Ciccarelli et al. (2009).

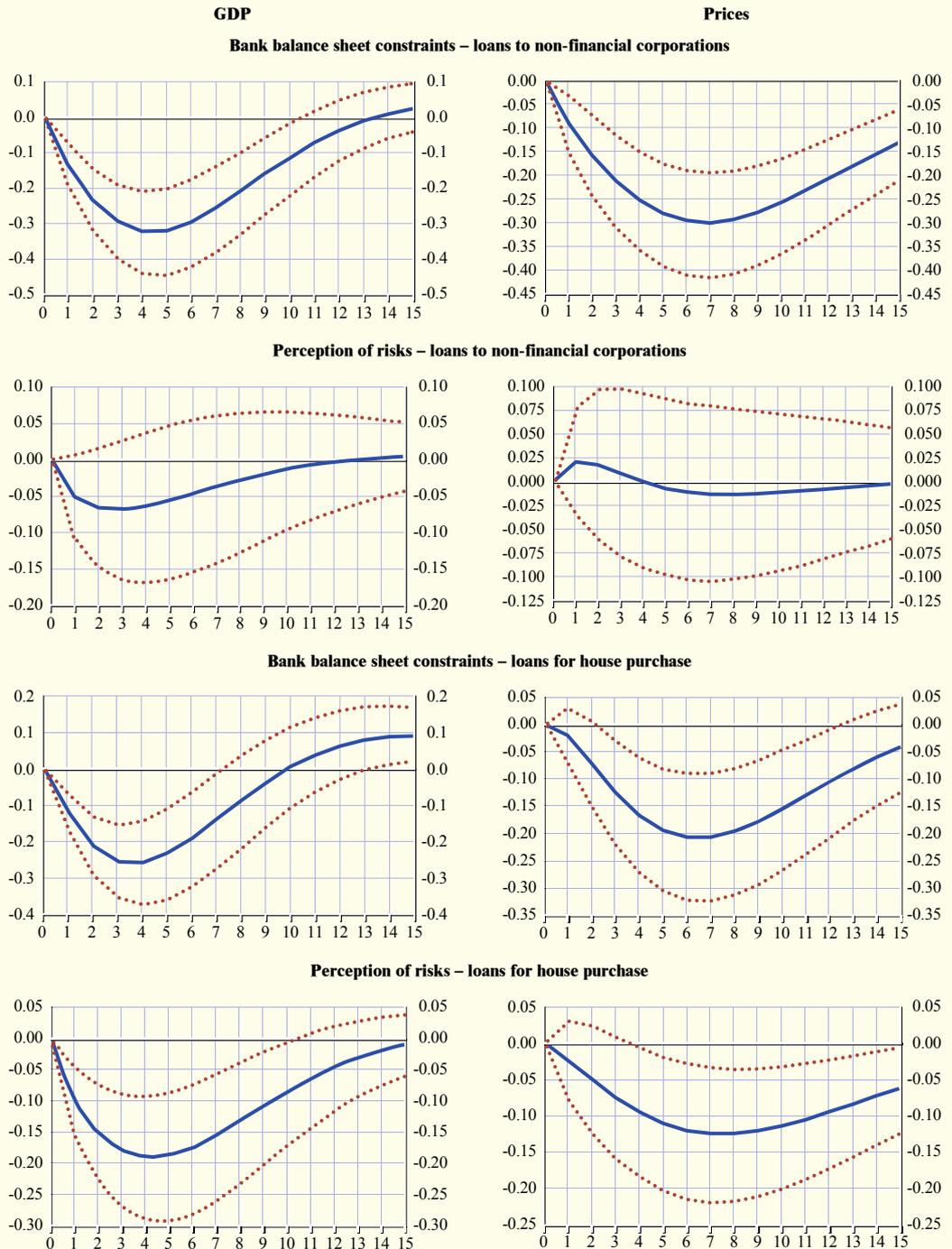
Notes: These graphs plot the response of log real GDP and a GDP deflator to a shock to credit supply in the order of one standard deviation. Credit supply is measured by the answers related to credit standards applied to loans to non-financial corporations, loans to households for house purchase and consumer loans as reported in the Eurosystem bank lending survey. The confidence bands are 68% Bayesian credible bands.

Restrictions on credit supply also have an effect on the dynamics of prices. Chart 9 shows that a restriction on credit for all categories of loan results in a decline in inflation.<sup>37</sup> Compared with the impact on GDP, the effect on prices takes more time to reach a peak.

The panel VAR approach can also help to disentangle the relative importance of the balance sheet and the bank lending channels. These transmission mechanisms were identified

37 The price index is the GDP deflator.

**Chart 10 Response of GDP and prices to credit supply restrictions due to bank balance sheet constraints and perception of risk**



Source: Ciccarelli et al. (2009).  
 Notes: These graphs plot the response of log real GDP and a GDP deflator to a shock to credit supply in the order of one standard deviation. Credit supply is measured by the answers related to “bank balance sheet constraints” and “perception of (borrower) risk” applied to loans to non-financial corporations and loans to households for house purchase as reported in the Eurosystem bank lending survey. The confidence bands are 68% Bayesian credible bands.

using survey responses related to whether banks changed their standards on account of “bank balance sheet constraints” and/or as a result of the “perception of (borrower) risk”. The impulse response functions shown in Chart 10 suggest that the functioning of the two channels in the euro area differs somewhat for loans to households for house purchase and loans to non-financial corporations. For mortgage loans, both supply channels are active, and their size is comparable. In the case of loans to non-financial corporations, only the bank lending channel seems to have an impact on economic activity.

In sum, available empirical evidence suggests that the various credit channels discussed in Section 2 are part of the monetary policy transmission in the euro area. More precisely, empirical findings indicate that the bank lending channel – including the bank capital channel – is of more relevance than suggested by earlier studies undertaken at the turn of the century. Moreover, there is increasing evidence of the existence of a balance sheet channel of monetary policy transmission in the euro area. Finally, recent empirical results point to an amplification of monetary policy impulses via the so-called risk-taking channel.

During the current financial crisis and particularly in the aftermath of the default of Lehman Brothers, credit supply frictions most likely impacted on banks’ credit standards, with adverse implications for the provision of credit and economic activity. There are, however, as yet only few empirical studies that support this interpretation, as the number of observations for this period is still limited. At the same time, monetary policy action has contributed to addressing the impairment in credit supply by substantially lowering policy rates and by employing special (non-standard) measures such as the introduction of long-term refinancing operations of up to one year, the widening of the collateral framework and the purchase of covered bonds. These policy measures may indeed have contributed to the decrease in the net tightening of credit standards, as reported in the most recent bank lending survey rounds.<sup>38</sup>

However, credit supply constraints may still exist for certain borrower segments in the euro area and, accordingly, there is a need for banks to pass the effects of the policy actions taken on to their borrowers and to fully exploit recapitalisation opportunities. Finally, it is essential for market adjustments to proceed, even though the required adjustments might vary across regions and market segments.

#### 4 CONCLUDING REMARKS

This article has presented new evidence concerning the impact of monetary policy on bank loan supply and economic activity in the euro area. It has also introduced new empirical evidence based on information provided by the bank lending survey for the euro area. This new source of data offers the potential to better disentangle the relationship between loan supply and loan demand, which has been hard to assess empirically with available quantitative aggregate economic data. The empirical results have provided indications of the existence of a credit channel in the euro area having become more visible in the period of financial turmoil since mid-2007.

As regards the bank lending channel, the current turmoil has put substantial strain on banks’ ability to fund themselves via deposits and markets. As regards market-based funding, securitisation, an important source of refinancing for banks, has suffered significantly over the last two years. Moreover, the deterioration of banks’ capital positions, also as a result of their substantially weaker profitability, has put their balance sheets under additional stress. All in all, these different pressures on banks’ balance sheets and their cost of funds seem to have affected bank loan supply to the household and corporate sector in the current crisis. In addition, the deterioration of borrower creditworthiness has had a substantial impact on the quality

<sup>38</sup> See, for instance, Box 2, entitled “The results of the July 2009 bank lending survey for the euro area”, in the August 2009 issue of the Monthly Bulletin.

of loan demand and has put further strain on banks' ability and willingness to lend. This has become particularly apparent in the risk-related information provided by the bank lending survey.

At the same time, the empirical results indicate that the worsening of overall economic conditions and the economic outlook has weighed heavily on the demand for loans. Depending on the methodology applied, empirical findings suggest that the current weak development of overall bank lending in the euro area is mainly affected by particularly low demand for loans from the real sector. However, this does not rule out the possibility that there are also constraints on credit availability, at least for certain borrower segments.

The monetary policy pursued by the ECB over the past two years since the eruption of the financial crisis should be seen against this background. Safeguarding price stability as its primary goal, the policy measures, taken by the ECB since mid-2007 have supported demand, mainly through consecutive reductions of the key ECB interest rates, and have bolstered loan supply, in particular through its "non-standard" policy measures, such as the provision of funding to the banking system via its long-term full allotment liquidity operations and the purchase of euro-denominated covered bonds. These monetary policy actions should be seen in the context of the predominant position of the banking system in providing funds to the firms and households in the euro area. It is therefore important that euro area banks take the opportunity to pass on the liquidity support provided by the Eurosystem to their ultimate borrowers, which in turn should support spending and investment in the period ahead.