

# Understanding the weakness of bank lending

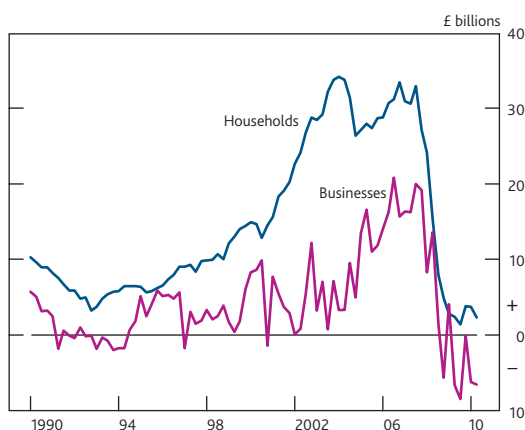
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The flow of new bank lending to UK households and businesses fell sharply following the start of the global financial crisis in mid-2007. That provoked an ongoing debate about the extent to which the sustained weakening of bank lending was caused by a fall in demand for credit, or a fall in supply. While it is difficult to disentangle the effects of shifts in credit demand and supply, this article finds evidence of a substantial and persistent tightening in credit supply conditions from mid-2007. But independently weaker credit demand — probably associated with the impact of the global financial crisis — is also likely to have contributed to the weakness in bank lending.

## Introduction

The recent global financial crisis was accompanied by a marked fall in the flow of new bank loans to UK businesses and households (**Chart 1**), and lending has remained subdued even as economic activity has begun to recover. Weaker bank lending is likely to reflect both a tightening in the supply of credit and an easing in the demand for credit. This article reviews the available evidence on the relative importance of each of these factors in explaining the weakness of bank lending.

**Chart 1** Quarterly flow of net lending to UK households and businesses<sup>(a)</sup>



(a) Lending to individuals and M4 lending (excluding securitisations) to private non-financial corporations (PNFCs).

The global financial crisis began in mid-2007, triggered by emerging losses in the US sub-prime mortgage market. As the financial crisis intensified, the funding costs of lenders in the United Kingdom rose markedly relative to Bank Rate. That made it more expensive for them to fund the loans and

facilities to which they were already committed and discouraged new lending.

The financial crisis also exposed other systemic vulnerabilities,<sup>(2)</sup> and the resulting adjustment in the banking system took several forms. Some financial institutions raised equity and sold assets. Banks both in the United Kingdom and abroad tightened credit conditions. And some foreign lenders withdrew from lending in the United Kingdom.<sup>(3)</sup>

Alongside the tightening in the supply of credit, a number of factors are likely to have weighed on the demand for loans during the financial crisis. Some of these may have been a direct or indirect consequence of tighter credit supply conditions, and some may have occurred independently. Companies may have scaled back or postponed investment plans, and therefore their demand for finance, in part reflecting increased spare capacity, a reduction in expected demand for their products or greater uncertainty about the economic outlook. Some households may have scaled back spending due to concerns over job losses, or expectations of lower pay growth. The economic downturn may also have encouraged both households and companies to revise down the levels of debt that they wished to hold.

But, in the opposite direction, other factors may have bolstered credit demand. Monetary policy was loosened markedly between mid-2007 and late 2009, and Bank Rate remains at 0.5%. Lower interest rates increase the incentive to consume or invest today, which, for some households, would

(1) The authors would like to thank Emily Beau for her help in producing this article.

(2) These issues have been covered in detail in past *Financial Stability Reports*.

(3) See the box on pages 18–19 of the June 2009 *Financial Stability Report*.

increase their demand for credit. In addition, some households may borrow to smooth out consumption in the face of temporary weakness in income. Similarly, some businesses may have needed more day-to-day finance (sometimes referred to as 'working capital' finance) as short-term cash flow came under pressure from strains along their supply chains.

Identifying the relative contribution of tight credit supply and weak credit demand to the weakness in lending is important for monetary policy. To the extent that weak bank lending reflects tight supply rather than weak demand, then weak lending is more likely to dampen the recovery in activity. For example, an increase in the cost of credit would push down investment spending.

The remainder of the article is structured as follows. First, it discusses the issues around identifying changes in credit demand and credit supply in principle. Second, it takes several different approaches to assess the extent to which changes in credit supply and demand have contributed to the weakness in bank lending.

## Identifying changes in credit demand and supply

Disentangling the impacts of changes in the demand for and the supply of credit is difficult. Only the cost of borrowing and the quantity advanced are directly observable. And lenders only observe demand for credit given the rates and other terms and conditions on the products that they make available. Similarly, borrowers only report their demand given the cost and availability of products.

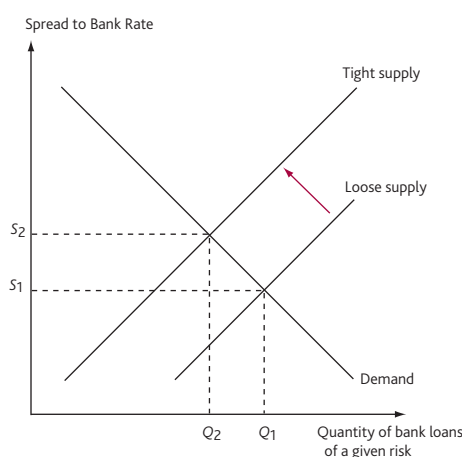
Simple economic theory can help to assess how the cost and quantity of bank lending would be expected to change given movements in credit demand and supply. In a simple framework, where the quality of potential borrowers is assumed to be fixed, credit demand and credit supply are related to a measure of the cost of credit (for example, the interest rate spread on loans relative to Bank Rate). The higher the cost of credit, the less willing people will be to ask for credit, but the more willing institutions will be to provide it.

In this simple framework, prices move to bring demand and supply into balance. As such, when the amount of credit advanced falls, it must ultimately be because both the amount of credit demanded and supplied have fallen. For example, if there is a reduction in banks' willingness to lend, prices will rise so as to choke off demand and bring the market back into balance. The identification issue in explaining the weakness of bank lending is not whether supply or demand have fallen — both have — but it is assessing the underlying cause of that decline, whether it is an independent tightening in the supply

of credit, an independent fall in credit demand, or some combination of both.

**Figure 1** illustrates a tightening in the supply of credit (represented by a leftward shift in the supply curve from 'loose supply' to 'tight supply'), consistent with the definition of a credit supply shock used by Bernanke and Lown (1991).<sup>(1)</sup> Such a tightening in credit supply could reflect a number of factors, including an increase in banks' funding costs relative to Bank Rate, or a reduction in risk appetite. **Figure 1** suggests that a reduction in the supply of credit would result in an increase in the cost of credit and a reduction in the quantity of bank lending. Following the shift in credit supply, lenders would observe weaker credit demand, as borrowers shift along their credit demand schedule, but that would reflect the tightening in credit supply and hence the movement to the new equilibrium, rather than an independent shift in overall credit demand.

**Figure 1** Illustration of a tightening in credit supply

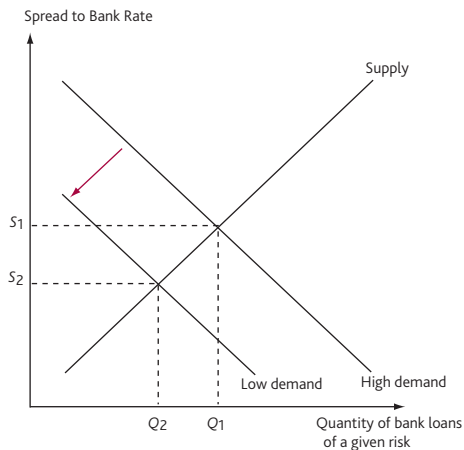


The sensitivity of credit demand to changes in its cost — known as the elasticity of demand — influences the extent to which the price and quantity of lending adjusts. The elasticity of demand reflects a number of factors, including the alternative sources of finance available. For example, large companies have more alternative sources of finance than small companies and households, so their demand is likely to be more sensitive to changes in credit supply than that of small companies or households. And the increase in the cost of issuing corporate bonds — an alternative source of finance for large companies — during the crisis would also have boosted the demand for bank credit at any given spread.

**Figure 2** illustrates how an independent reduction in demand for credit (represented by a downward shift in the demand curve from 'high demand' to 'low demand') would result in a

(1) The Bernanke-Lown (1991) definition of a credit crunch is: a significant leftward shift in the supply curve for bank loans, holding constant both the safe real rate of interest and the quality of potential borrowers.

**Figure 2** Illustration of a weakening in credit demand



reduction in the quantity of bank lending, and a reduction in the cost of credit. The sensitivity of credit supply to changes in the demand for credit would influence the price and quantity of lending in the new equilibrium.

The strength of this simple framework is that it gives a clear picture. But the real world is inevitably more complicated. For example, in practice, the quality of potential borrowers changes over time, and that can affect the interpretation of a change in loan spreads. On the one hand, if the quality of borrowers deteriorates, as is likely to have happened during the financial crisis, lenders would require a higher spread to compensate them for the increased risk associated with lending. That could be misinterpreted as a credit supply shock, which would overstate the extent to which weak bank lending reflects a genuine tightening in credit supply. On the other hand, lenders might restrict credit supply by tightening non-price terms and conditions to improve the quality of borrowers that are granted credit. The resulting reduction in loan spreads could be misinterpreted as a reduction in loan demand or a loosening in the supply of credit. So it is important to control, insofar as possible, for changes in the quality of borrowers and borrowing terms in making an assessment about the drivers of the weakness of bank lending.

The overall demand for credit is likely to be influenced by other factors in addition to the spreads on loans relative to risk-free rates. For example, overall demand for credit is likely to be a function of total borrowing costs, among other things, rather than just the spread relative to Bank Rate as drawn in the simplified example. During the financial crisis, falls in Bank Rate would have boosted demand for credit for any given spread, working against the impact of any other weakening in credit demand. Demand for credit is also likely to be affected by expectations of the future cost and availability of credit, reflecting the long-term nature of financing needs. When taking out a mortgage, households' expectations of future spreads and Bank Rate will influence their current demand for credit. And companies' borrowing decisions are likely to be

influenced by the likelihood that loan facilities will be renewed in the future.

Second-round effects further complicate the identification of changes in credit demand and supply. For example, when businesses cancel their expansion plans because they cannot obtain a loan, credit demand from the suppliers of those businesses may also be weaker. To the extent that such second-round effects have been important, a simple analysis would tend to underestimate the size of the underlying shock to credit supply, and attribute more of any weakening in lending to an independent shift in credit demand.

Nonetheless, this simple framework can help to identify credit demand and supply shocks. As this article goes on to discuss, the weakness of bank lending has been associated with higher spreads (as in **Figure 1**), rather than lower spreads (as in **Figure 2**). That suggests that a tightening in credit supply is likely to be a significant part of the explanation for weak bank lending during the recession following the financial crisis. It is not possible to say, using this simple framework, whether there have been independent shifts in credit demand as well.

## Evidence on credit supply and credit demand

This section discusses evidence on changes in credit supply and demand using five approaches. First, using evidence on the price and availability of loans to households and companies. Second, evidence from the lenders is examined. Third, evidence from business surveys and reports from the Bank's Agents is used. Fourth, information on the price and quantity of non-bank finance is scrutinised. Finally, the article discusses the results from an econometric identification of credit supply and demand shocks.

### Price and availability of bank credit

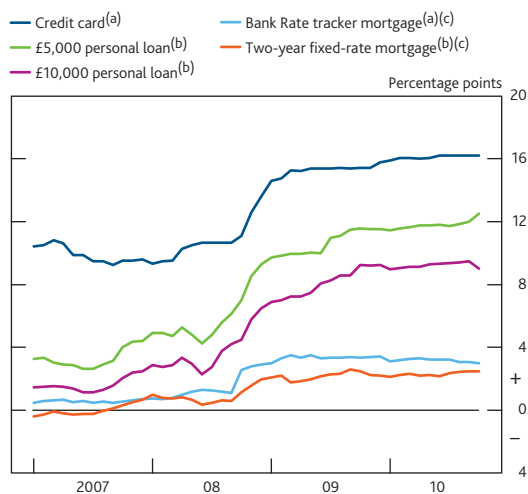
Assessing the extent to which credit conditions have changed without a detailed investigation of data on individual loans is necessarily imperfect. Nevertheless, this section brings together the available evidence in order to assess the contribution made by tighter credit supply to the rise in the relative cost of credit and the reduction in availability during the financial crisis.<sup>(1)</sup>

### Households

Spreads on bank credit to households rose during the financial crisis, and the availability of loans tightened. Spreads increased between mid-2008 and early 2009, and have remained high (**Chart 2**). Increases were most marked for relatively risky loans, such as unsecured lending. But spreads rose on mortgages obtained with even a 25% deposit. Credit availability also fell, particularly for those with little equity built up in property on which to secure their loans. While

(1) For a discussion of recent developments in credit conditions, see Section 1.3 in the November 2010 *Inflation Report*.

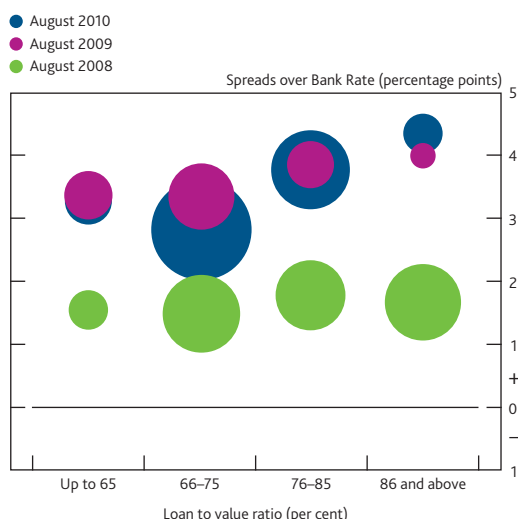
**Chart 2** Average quoted interest rate spreads on household loans



(a) Spreads are taken over Bank Rate.  
 (b) Spreads are taken over two-year swaps.  
 (c) At 75% LTV.

loans of up to 90%–95% of the value of the property (LTV) — and some products with LTVs in excess of 100% — were common in the few years preceding the financial crisis, the number of products with LTVs in excess of 85% dropped to a fraction of its pre-crisis level by mid-2009, and has remained low (Chart 3). In part, the tightening in credit conditions is likely to have been in response to the unusually loose conditions immediately prior to the crisis.

**Chart 3** Floating-rate mortgage spreads and product availability across loan to value ratios<sup>(a)</sup>



Sources: Moneyfacts Group and Bank calculations.

(a) End-month advertised rates for products with different LTV ratios. Size of bubble reflects the number of products. The spread is calculated over Bank Rate at the end-month for the relevant period.

The loan pricing framework set out in Button *et al* (2010) can be used to assess the factors driving higher spreads. Their analysis shows that higher bank funding costs and residual items such as the mark-up or operating costs on a 75% LTV mortgage together have increased by around 2.5 percentage

points compared to pre-crisis averages (Table A). The equivalent increase in spreads on unsecured personal loans has been over 6 percentage points.

**Table A** Decomposition of new lending rates<sup>(a)</sup>

Differences from 2004–07 averages (percentage points)	2008	2009	2010 <sup>(b)</sup>
Mortgage spread <sup>(c)</sup>	0.8	2.7	2.5
<i>of which:</i>			
Funding cost	1.6	1.5	1.2
Credit risk factors	-0.1	0.0	0.0
Residual	-0.8	1.2	1.4
Unsecured loan spread <sup>(d)</sup>	1.3	5.7	6.8
<i>of which:</i>			
Funding cost	0.9	1.2	1.3
Credit risk factors	-0.1	0.4	0.5
Residual	0.5	4.2	5.0

Sources: Bank of England, Bloomberg, British Bankers' Association, Council of Mortgage Lenders, Markit Group Limited, UK Cards Association and Bank calculations.

(a) For details on the data and method used in the decompositions, see Button *et al* (2010). As discussed in that article, the marginal source of funding, and the way in which lenders set their loan rates, may vary across different institutions. So while this decomposition is likely to be useful in understanding loan pricing in aggregate, the experience of individual lenders may vary. Contributions may not sum to the total due to rounding.  
 (b) Data are an estimate based on data to October 2010.  
 (c) 75% LTV tracker mortgage average quoted rate relative to Bank Rate. The funding cost is shown as a spread relative to Bank Rate.  
 (d) £10,000 personal loan average quoted rate relative to two-year swaps. The funding cost is shown as a spread relative to two-year swaps.

That loan pricing decomposition suggests that the bulk of the increase in spreads since mid-2007 reflects tighter credit supply. Although perceived credit quality — identified as an increase in credit risk factors in Table A — has deteriorated over this period for unsecured borrowing, that appears to have made a relatively small contribution to increased spreads. If lenders had reduced spreads in response to weak demand, that would have pushed down the residual components of loan prices, while tighter supply would have pushed up the residual components. Although there may be other unmodelled factors affecting the residual components, the residuals have increased markedly since 2008 (Table A), suggesting that tighter credit supply is likely to have been more important than weaker credit demand.

### Businesses

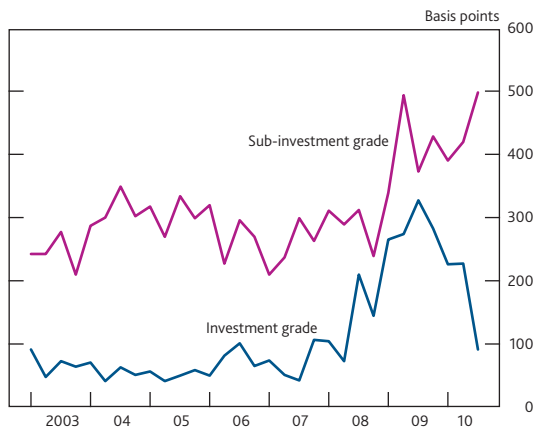
Measuring the impact of tighter credit supply on the cost of bank finance to businesses is harder than it is for households. First, there are no comprehensive data on quoted interest rates on new loans split by credit quality. The alternative — average lending rate data — will reflect changes in the quality of loans. Second, there is no clear distinction in the available data between interest rates on new and existing loans: for some lenders, new business includes companies drawing down existing facilities with pre-arranged costs, or loans that have been repriced in line with changes in reference rates. Reflecting both of these factors, and given that existing facilities are likely to have had lower spreads than those on genuinely new credit since the start of the crisis, measured

effective rates are likely to underestimate the rates at which companies are able to arrange genuinely new loans from banks in practice.

Indicative data on loans to small and medium-sized enterprises (SMEs), available from late 2008 onwards, point to a rise in interest rate spreads for some borrowers. According to data from the Department for Business, Innovation and Skills, margins over the banks' own base rates for SMEs who applied for overdrafts in 2008 were significantly higher than they had been in earlier years.

Another indicator of the cost of finance is spreads on new syndicated loans — large loans provided by a group of banks or other lenders.<sup>(1)</sup> Syndicated loan spreads increased sharply from mid-2008, with investment-grade spreads rising to a peak of over 300 basis points (Chart 4). But these spreads are based on a small number of deals, as the flow of syndicated lending to UK businesses declined sharply from its peak in mid-2007. More recently, investment-grade spreads have fallen back, although sub-investment grade spreads remain elevated.

Chart 4 Spreads reported on syndicated loans<sup>(a)</sup>



Sources: Dealogic and Bank calculations.

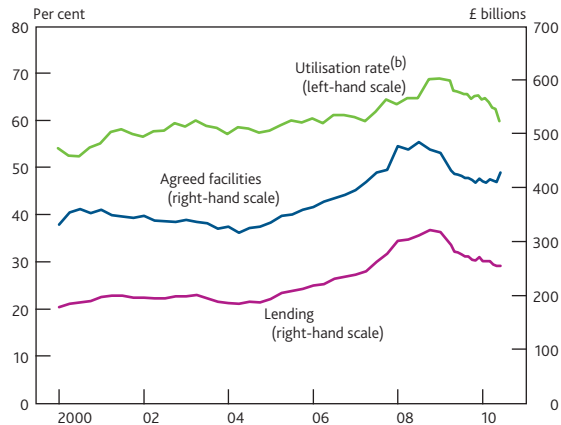
(a) Average disclosed spreads over reference rates in the currency in which loan tranches are denominated, weighted by tranche size. Investment grade is classified by Dealogic as a rating of BBB- or higher, with the classification adjusted where ratings change over the life of the loan. If there is no rating, then the loan spread on origination is used as the basis for classification, with any margin up to 250 basis points classified as investment grade. Quarterly data.

It is difficult to assess the extent to which increased spreads on corporate loans reflect tighter credit supply. Although an equivalent decomposition of loan pricing as discussed for new household borrowing is not available, it is likely that increased funding costs would also have pushed up the cost of corporate lending. So it is likely that at least part of the estimated rise in SME spreads and syndicated loan spreads reflects tighter credit supply.

An indicator of credit availability is the amount of agreed lending facilities outstanding, and the utilisation rates of those facilities. The outstanding stock of facilities (excluding

facilities advanced to the real estate sector)<sup>(2)</sup> fell sharply from mid-2008. And utilisation rates rose from mid-2007 to early 2009 as companies made more intensive use of their already-agreed facilities, but utilisation rates have since fallen back (Chart 5).

Chart 5 PNFCS' agreed facilities, lending and utilisation rate<sup>(a)</sup>



(a) Private non-financial corporations (PNFCS) excluding commercial real estate. The data are quarterly prior to 2009 Q3 and monthly thereafter.  
(b) The utilisation rate is the amount of lending divided by the amount of facilities agreed.

Utilisation data suffer from the same identification issues as other indicators of credit demand and supply, however. Low utilisation rates might suggest weak demand for credit relative to supply. But low utilisation rates may also reflect the response of demand to higher lending spreads and more stringent terms and conditions on new facilities. Furthermore, concerns among businesses that existing facilities might be withdrawn, or become more expensive in the future, would lead them to reduce their reliance on bank credit before those facilities expire. As a result, low utilisation rates need not necessarily imply weak demand for credit. Similarly, if lower-quality borrowers are put off applying for credit by the high cost of borrowing, consistent with low numbers of loan applications, that might boost approval rates.

Overall, the evidence suggests that the cost of credit rose sharply during the financial crisis, and that there was a reduction in the availability of credit, both for households and companies. For households, the available evidence points to an increase in credit spreads controlling for changes in credit quality, consistent with a significant role for tighter credit supply in explaining the weakness of bank lending. The evidence for corporate lending is less clear-cut, but it is likely that tight credit supply played a role in driving up the cost of credit.

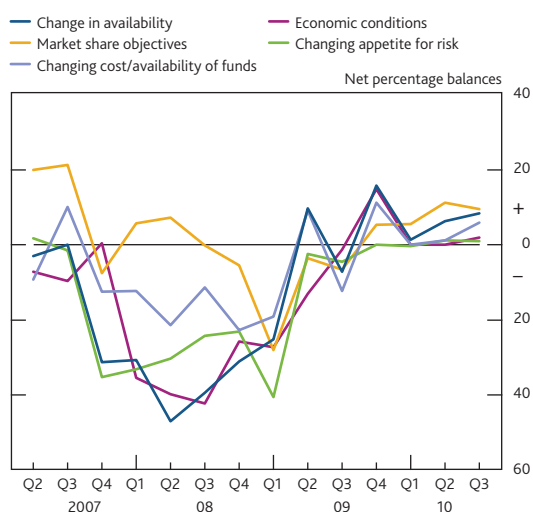
(1) See the box on page 8 of the July 2010 *Trends in Lending* for a discussion of recent trends in syndicated lending.  
(2) The relationship between agreed facilities and lending in the real estate sector has different aggregate dynamics to that in other sectors. See the box on page 7 of the September 2010 *Trends in Lending* for a discussion of recent trends in lending to the real estate sector.

## Evidence from the lenders

Evidence from the lenders suggests that price and non-price terms on loans rose during the financial crisis. Lenders responding to the Bank's *Credit Conditions Survey* reported that spreads increased markedly across all types of lending, particularly during 2008 and early 2009. The net percentage balances of lenders reporting increased fees on secured lending and fees/commissions on loans to companies also rose.

According to the *Credit Conditions Survey*, the availability of secured lending to households contracted markedly during 2007–08, and has remained tight (Chart 6 shows responses on changes in credit availability and the factors contributing to that). A net balance of lenders reported that tightening in part reflected economic conditions. That would be consistent with reduced availability to compensate for a deterioration in the quality of potential borrowers, rather than suggesting either a fall in demand or a tightening in supply. But lenders also reported a significant role for market share objectives, changing appetite for risk and changing cost/availability of funds. These three factors may be thought of as credit supply factors, suggesting that there was an independent tightening in the supply of secured credit during the financial crisis. A similar picture was reported for both corporate lending and unsecured lending to households during the worst of the recession, although lenders have reported some easing in corporate credit conditions over the past 18 months.

**Chart 6** *Credit Conditions Survey*: change in availability and factors contributing to change in availability of secured loans to households<sup>(a)</sup>



(a) Weighted response of lenders. A positive balance indicates looser credit availability or factors increasing the availability of credit over the past three months.

Lenders responding to the *Credit Conditions Surveys* indicated that demand for credit has fallen on average since 2007 H2 for most borrowers, with demand holding up only for small businesses (Table B). That is consistent with the findings reported by the Business Finance Taskforce.<sup>(1)</sup> But, as discussed above, lenders only see demand for credit given the rates that

they are charging, or given the availability of products. And they are unlikely to be able to tell whether the weakness in demand was caused by earlier tightening of credit supply or by independent factors. Indeed, given that the weakening in demand was accompanied by an increase in reported spreads and non-price terms on lending, weak credit demand is more likely to reflect the tightening in credit supply than independent factors.

**Table B** *Credit Conditions Survey*: demand for credit<sup>(a)</sup>

Net percentage balances	Averages <sup>(b)</sup>			
	Since 2007 H2	2009	2010 H1	2010 Q3
Large PNFCs	-16	-17	-4	-2
Medium PNFCs	-11	-11	6	-4
<b>Small business borrowing</b>				
Secured	0	4	19	-14
Unsecured	7	10	21	12
<b>Households</b>				
Secured	-4	19	-15	-6
Unsecured	-8	-19	-6	-12

(a) Weighted response of lenders. A positive balance indicates higher demand for credit over the past three months.

(b) Averages of quarterly data.

Overall, the evidence from the lenders points to a tightening in the supply of credit during the financial crisis, although conditions for large companies have improved over the past year or so and conditions for other borrowers appear to have stabilised. Lenders also reported a weakening in demand for credit during the financial crisis, but in part that is likely to reflect the effect of the tightening in credit supply.

## Evidence from the Bank's Agents and survey data

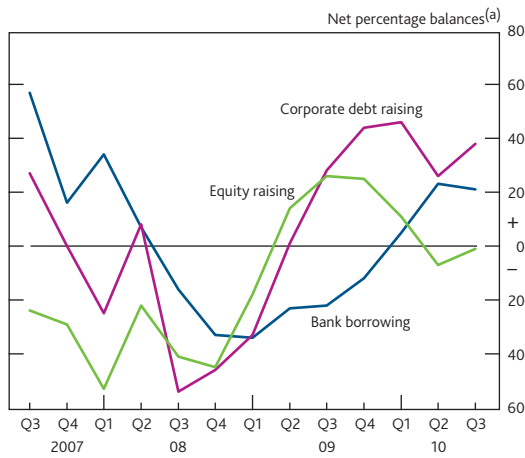
Survey evidence and reports to the Bank's Agents point to a tightening in bank credit conditions for businesses during the financial crisis. Respondents to the *Deloitte Chief Financial Officer* surveys indicated that bank credit became increasingly unattractive during 2007–08, although it has become more attractive since then (Chart 7). Evidence from contacts of the Bank's Agents and various business surveys points to a sharp drop in the perceived availability of credit to SMEs in 2007–08, and higher rates relative to Bank Rate or Libor.<sup>(2)</sup> That initial tightening appeared to be sharper than for larger companies, and in recent months conditions are reported to have improved by less, if at all, for SMEs.

Reports from the Bank's Agents suggest that, in part, the rise in spreads and reduction in availability reflected increased risk. Some regional banking contacts described themselves to the Bank's Agents as frustrated by the lack of demand from

(1) See 'Supporting UK business, the report of the Business Finance Taskforce', available at [www.bba.org.uk/media/article/business-finance-taskforce](http://www.bba.org.uk/media/article/business-finance-taskforce).

(2) See the box on pages 7–8 of the October 2010 *Trends in Lending* for further details on lending to SMEs, and the box on pages 30–31 of the February 2010 *Inflation Report* for a discussion of how SMEs have been affected during the recession.

**Chart 7** Survey measures of the attractiveness of different sources of finance



Source: *The Deloitte CFO Survey 2010 Q3*.

(a) Net percentage balances are calculated as the percentage of respondents who thought that each source of finance was attractive less the percentage who thought that it was unattractive.

'good-quality' propositions, even as companies reported that they had seen the terms of their borrowing tighten. That suggests that lenders saw some companies unable to access finance as too risky.

Survey evidence suggests that deteriorating credit quality can only in part explain increased spreads and reduced availability, however. Using responses from the UK survey of SME finances, Fraser (2009) found that the businesses with the most difficulty in obtaining bank credit tended to be higher-risk companies. But he also found that loan rejections increased in 2008 compared with the 2005–08 period, even having attempted to control for the riskiness of borrowing SMEs.

Reports from the Bank's Agents and survey evidence suggest that demand for finance weakened markedly during the recession. A survey conducted by the Bank's Agents in late 2009 concluded that, on balance, the weakness in economic activity was the prime factor accounting for the fall in investment during the recession, rather than tighter credit supply. And despite recent improvements in credit conditions for some businesses, reports from the Bank's Agents are consistent with only a gentle recovery in investment rather than robust growth.

Overall, evidence from surveys and the Bank's Agents suggests a role for both tight credit supply and subdued credit demand in the weakness of bank lending to companies. Such evidence can provide little steer, however, in quantifying the relative contribution of changes in demand and supply.

**Evidence from non-bank sources of finance**

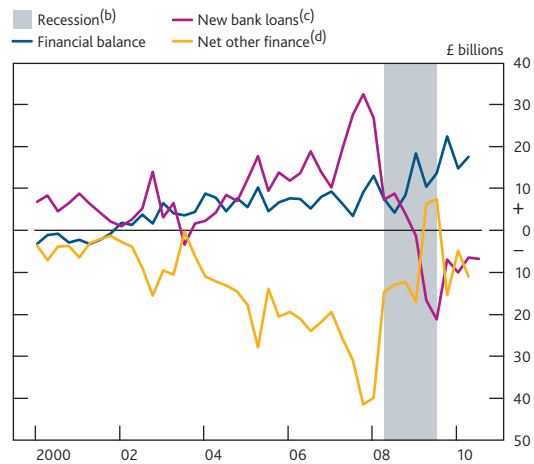
Developments in non-bank finance may provide indirect evidence of changes in demand for bank loans. If households and companies reduce their borrowing from banks and switch to another source of finance, the resulting weakness in bank

lending is more likely to reflect tighter credit supply than weaker demand.

For households, there are few alternative sources of finance. Probably reflecting that, the contraction in lending to the household sector since mid-2007 has been broadly matched by a higher household saving ratio as households have reduced spending relative to disposable income.

By contrast, some businesses — particularly large companies — can raise finance by issuing equities or debt, including corporate bonds and commercial paper, although these are unlikely to be perfect substitutes for bank borrowing. The decline in bank lending to companies since early 2008 has been associated with less negative flows of other types of finance alongside a rise in financial saving (Chart 8). Indeed, PNFCs' net equity and bond issuance was considerably higher in 2009 than its 2003–08 average, although it has fallen back to around average so far in 2010. That suggests that demand for finance held up for those companies raising capital market finance.

**Chart 8** PNFCs' financial transactions<sup>(a)</sup>



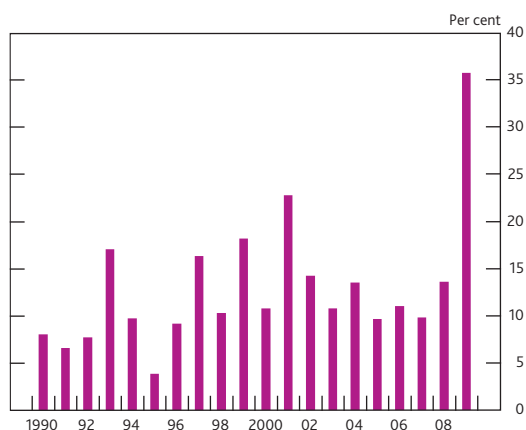
(a) The latest observation is 2010 Q3 for new bank loans and 2010 Q2 for the remaining series.  
 (b) The recession is defined as at least two consecutive quarters of falling output (at constant market prices) estimated using the latest data. The recession is assumed to end once output began to rise.  
 (c) Sterling and foreign currency loans to PNFCs.  
 (d) Calculated as a residual: the sum of the financial balance, new bank loans and net other finance is equal to zero.

That is borne out by company-level evidence of switching away from bank loans towards bond finance during the financial crisis. To assess this, we construct a panel of large UK PNFCs that have raised finance using bond markets from 1990–2009 for which data on total long-term borrowing as well as bond issuance are readily available.<sup>(1)</sup> In each year, the share of total borrowing by those companies accounted for by bond issuance is calculated. Preliminary results suggest a marked shift towards bond finance since 2007 (Chart 9). That is consistent with a tightening in the supply of non-bond finance. These findings are broadly consistent with US

(1) With thanks to Giuseppe Vera, who carried out the analysis.

company-level evidence discussed in Becker and Ivashina (2010). And in 2010 there has been an increase in the number of UK PNFCs accessing the corporate bond market for the first time.

**Chart 9** Share of bonds in total borrowing for businesses with demand for credit<sup>(a)</sup>

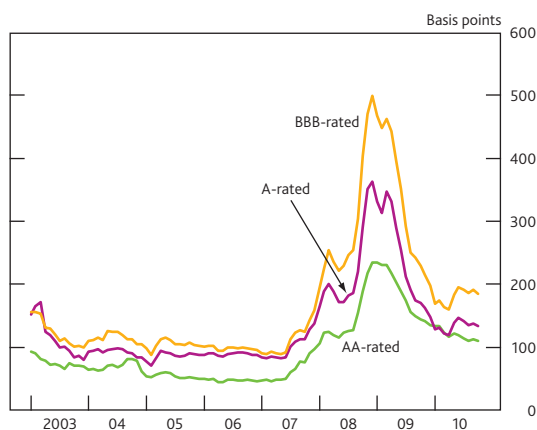


Sources: Dealogic, Thomson Reuters Worldscope company accounts database and Bank calculations.

(a) Data are based on a panel of 97 UK PNFCs for which equity is listed in the United Kingdom and that have issued at least one corporate bond between 1990 and 2009. For each year, we then select only those companies that raised long-term finance (as per the financial statement variable 'long-term borrowing', which is defined as borrowing with maturity over one year). The chart shows the proportion of long-term borrowing accounted for by corporate bonds, averaged across the sample of companies.

Developments in the cost of non-bank finance may also provide information about the cost of bank loans. For example, because some large companies can choose between issuing corporate bonds and taking out a loan, their respective prices should be influenced by each other. Corporate bond spreads (relative to gilts) for UK investment-grade PNFCs rose sharply in 2008 and peaked around the start of 2009 (Chart 10). That rise may underestimate the increase in spreads on bank loans: reports from the major lenders suggest that some PNFCs repaid bank loans using the proceeds of capital market issuance, suggesting that those loans were more expensive than bond finance.

**Chart 10** UK PNFC corporate bond spreads by rating<sup>(a)</sup>



Sources: Merrill Lynch and Bank calculations.

(a) Average option-adjusted spreads between sterling corporate bond yields and government bond yields of corresponding maturity. Monthly averages of daily data. The latest observations are October 2010.

It is possible to use an econometric approach to assess the extent to which increases in corporate bond spreads reflect tight credit supply relative to changes in credit risk.<sup>(1)</sup> The analysis assumes that any systematic variation in corporate bond spreads for individual companies that is unrelated to changes in their equity price and macroeconomic indicators reflects changes in credit supply.<sup>(2)</sup> Stripping out these factors is assumed to control for changes in both company-specific risk (through the company's equity price) and changes in economy-wide risk (through the macroeconomic variables). Preliminary analysis using this approach suggests that tighter credit supply accounted for the bulk of the rise in corporate bond spreads between August 2007 and early 2009, although it has become less important since then. Even after controlling for credit quality, supply conditions appear to have tightened by more for high-risk borrowers.

Overall, evidence from both volumes and prices of non-bank finance suggest a role for both tight credit supply and weak credit demand. But tighter credit supply is likely to have been a somewhat more important driver of weak bank lending than independently low demand.

### Econometric identification of credit supply shocks

Another way to identify the impact of changes in credit demand and credit supply on lending is to use an econometric identification scheme. One such approach is to estimate a structural vector autoregression (SVAR), and identify shocks to credit supply.<sup>(3)</sup> The intuition for this approach, following from the simple demand and supply diagrams discussed above, is that a credit supply shock is associated with both a reduction in the quantity of lending and an increase in spreads. Such a credit supply shock would be associated with a reduction in the demand for credit as spreads increased, but that would be in response to tighter credit supply rather than an independent credit demand shock. The model estimates the extent to which such shocks have been observed historically. The box on page 319 describes the SVAR approach in more detail.

The results of the SVAR suggest that the credit supply shock may account for a large part of the slowdown in annual real bank lending growth (Table C). So far in 2010, however, other factors have also become important. Given the lags included in the estimation, the contributions from the different factors reflect both shocks occurring in each period and lagged responses to previous shocks. The estimates are highly uncertain. For example, although the estimates based on the mean parameters suggest that credit supply shocks detracted

(1) The analysis follows the method proposed by Gilchrist *et al* (2009), and was carried out by Giuseppe Vera.

(2) This identification strategy is likely to provide a lower bound for the impact of the credit shock, as any contemporaneous impact of credit supply shocks on equity returns or the macroeconomy will be attributed to increases in credit risk.

(3) With thanks to Alina Barnett and Ryland Thomas, who carried out this analysis.



## Estimating the contribution of credit supply using a structural vector autoregression (SVAR)

The SVAR approach involves estimating a set of equations, where each variable is regressed on past movements of itself and the other variables in the system. The SVAR includes standard macroeconomic variables — CPI inflation, GDP growth and Bank Rate — and a number of credit and financial market variables — M4 lending (adjusted for the effects of securitisations and lending to intermediate other financial corporations), investment-grade corporate bond spreads (as a general proxy for credit spreads) and equity prices. One disadvantage of this SVAR approach is that it is based on the empirical relationship between a small number of macroeconomic variables, and may provide a misleading description of a more complicated reality.

Using these equations, each variable can be decomposed into a component that is 'explained' by its own past outturns and those of other variables in the model, and an 'unexplained' residual. The unexplained component of each variable is then decomposed into the impact of different fundamental, or 'structural', shocks.

The shocks used in the SVAR are identified according to assumptions about how they are likely to affect the variables included in the model. For example, a credit supply shock is defined as one that is associated with weak lending and high credit spreads. The remaining shocks identified in the model can all be thought of as affecting demand for credit. For example, an 'aggregate demand' shock, which is identified as moving inflation and GDP in the same direction, would also be expected to affect credit demand. It is difficult to identify shocks separately in this way, as it requires a number of assumptions about the direction and timing of the impact of each shock. The results are preliminary and should be interpreted with caution.

**Table C** Decomposition of four-quarter real M4 lending growth using SVAR<sup>(a)</sup>

Percentage points	Averages		
	2008	2009	2010 H1
Credit supply shocks	-1.4 (-3 to 4)	-8.3 (-9 to -4)	-6.1 (-7 to -2)
Other shocks	-0.6 (-5 to 1)	1.8 (-2 to 2)	-2.6 (-6 to -2)
Trend	5.8 (5 to 6)	5.8 (5 to 6)	5.8 (5 to 6)
Lending <sup>(b)</sup> (per cent)	3.8	-0.7	-3.0

Sources: Bank of England, ONS and Bank calculations.

(a) For details of the model behind this decomposition, see the box above. The latest observations are 2010 Q2. The model is estimated using data from 1966 Q4–2010 Q2. Averages of quarterly data. Figures in parentheses are estimates of the uncertainty surrounding the contributions to lending from the various factors. They are based on estimating the 16th and 84th percentiles of the distribution around the parameters of the model (these percentiles are commonly chosen in econometric analysis).

(b) The series is constructed as M4 lending (excluding securitisations) growth prior to 1998 Q4 and the equivalent measure excluding borrowing by intermediate other financial corporations thereafter. The series is deflated using seasonally adjusted CPI data.

from real lending growth in 2008, a plausible range around the parameters in the model results in a decomposition that encompasses a boost from credit supply factors in 2008 (Table C). In 2009 and 2010 H1, however, the whole range suggests a negative credit supply shock.

The results are broadly consistent with recent preliminary work by Bassett *et al* (2010) for the United States. That uses individual lenders' responses to the *Senior Loan Officer Opinion Survey* to construct a measure of credit supply controlling for changes in credit risk and demand. It then uses a similar system of econometric equations to the SVAR discussed above, and finds that tighter credit supply during the crisis was associated with a large reduction in core lending capacity in the United States.

## Conclusion

Bank lending to UK households and businesses weakened sharply following the start of the global financial crisis in mid-2007. While it is difficult to disentangle the factors driving weak bank lending, the evidence discussed in this article suggests a significant role for a persistent tightening in the supply of credit, independent of changes in credit quality and Bank Rate. In part, that is likely to have been a reaction to the unusually loose conditions that existed immediately prior to the crisis. Credit demand is also likely to have weakened during the recession, weighing on bank lending. That is consistent with reports from the Bank's Agents.

Overall, the analysis in this article suggests that the weakness in bank lending since mid-2007 reflects a combination of tighter credit supply and weaker credit demand. Qualitatively, tight credit supply is likely to have been the dominant influence. For example, independently weak demand would typically be associated with lower spreads on loans, rather than higher spreads. And it is not consistent with the switch into capital market issuance by some PNFCs during the financial crisis. But it is difficult to assess the relative contribution of demand and supply more precisely.

While there is some evidence that credit supply conditions have improved somewhat since the peak of the financial crisis, especially for large companies with access to capital markets, constrained credit supply continues to be one of the main factors holding back the economic recovery. The Bank will continue to monitor developments in bank lending and the banking sector closely.

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