

Understanding the recent weakness in broad money growth

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The growth of broad money in the UK economy has slowed dramatically since the start of the recession. In part, that weakness reflects reduced borrowing by households and companies during the recession. But money balances held by asset managers also fell as deposits were used to purchase new equity and long-term debt issued by the banking sector in response to the financial crisis. Offsetting the weakness from these two factors was the programme of asset purchases — so-called 'quantitative easing' or QE — conducted by the Bank of England on behalf of the Monetary Policy Committee, which boosted broad money holdings. The evidence from the monetary data suggests that the programme of asset purchases contributed to an increase in asset prices and, ultimately, an increase in nominal demand in the economy, corroborating other evidence from financial market prices.

Introduction

Understanding movements in broad money is important for the conduct of monetary policy. Broad money is the sum of the sterling notes and coin and the sterling bank and building society deposits held by the UK non-bank private sector.⁽²⁾ The behaviour of broad money is likely to contain corroborative information about the current level of nominal spending in the economy. It may also provide incremental information about future movements in nominal spending and hence is a useful indicator of future inflationary pressure, alongside a range of other indicators.⁽³⁾ Additionally, the behaviour of broad money may help to reveal the nature of the monetary transmission mechanism, especially when monetary policy is operated through central bank asset purchases, intermediated via the banking system.

Since the onset of the financial crisis in the second half of 2007, money growth has slowed dramatically. By the start of the recession in 2008 Q2, annual broad money growth had dipped below the average rate observed over the previous decade, and by the end of 2009 it had fallen below 1%, although it has recovered a little since. This weakness in money growth is striking, even when viewed in a long-run historical context (**Chart 1**).⁽⁴⁾ Growth rates of less than 1% have not been observed since the early 1960s.

The continued weakness in broad money growth might look puzzling when compared to the recent behaviour of nominal spending in the economy. The growth rate of nominal spending (nominal GDP) has picked up sharply over the past

year, despite subdued money growth (**Chart 2**). This means that money has had to circulate at a greater rate in the economy to finance the higher value of transactions — in other words there has been an increase in the velocity of circulation of broad money.⁽⁵⁾ That is in contrast to the long-run downward trend observed in velocity since the 1980s.

The incremental information in broad money growth about future nominal spending has to be conditioned on a view of the outlook for the velocity of circulation. Currently broad money growth is weak, which might signal a downside risk to future nominal spending and, ultimately, inflation. But there may be reasons why both the supply of, and demand for, broad money may have changed relative to spending. That would lead to a change in the equilibrium level of the velocity of circulation. So understanding the recent factors influencing velocity and the extent to which they might persist will be important for assessing future inflationary pressures.

The aim of this article is to explain the recent weakness in broad money growth and the path of broad money velocity,

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- (1) The authors would like to thank Eleanor Broughton, Matt Davies, Dan McGing, Dan Nixon and Martin Udy for their help in producing this article.
 - (2) Throughout this article, unless stated otherwise, broad money is defined as M4 excluding the holdings of intermediate other financial corporations where available. For further detail on the definition of broad money, see Burgess and Janssen (2007).
 - (3) For more information on the link between broad money and inflation and on the use of broad money growth as an indicator of future inflation, see Thomas (1996) and Berry *et al* (2007).
 - (4) For more information on recent economic data in a long-term context, see Hills *et al* (2010).
 - (5) The velocity of circulation is defined as the ratio of nominal spending to the nominal level of broad money.

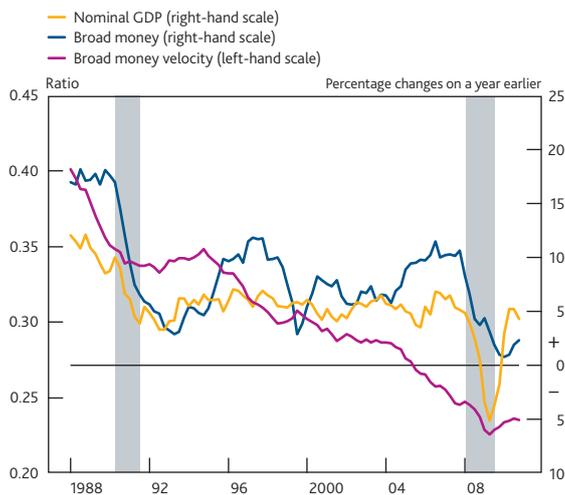
Chart 1 Broad money growth in a long-run context^{(a)(b)}



Sources: Bank of England, Capie and Webber (1985) and Hills et al (2010).

(a) Peacetime recession periods are shown in grey. Prior to 1924 annual recessions are shown. After 1924 periods of two or more consecutive quarters of negative growth are shown.
 (b) M3 up to 1963, M4 1963–98, M4 excluding intermediate 'other financial corporations' (OFCs) 1998–2010.

Chart 2 Velocity, broad money and nominal GDP^{(a)(b)(c)}



(a) Recession periods are shown in grey. Recessions are defined as in Chart 1.
 (b) Nominal GDP is measured at market prices.
 (c) Broad money velocity is defined as quarterly nominal GDP divided by the outstanding stock of broad money.

and draw out the implications for future nominal spending and inflation. The article is organised into four sections. The first section draws on earlier *Quarterly Bulletin* articles and outlines an established framework for thinking about the determinants of broad money and the relationship between money and nominal spending. The second section then applies this framework to the recent data, by looking at the key factors contributing to the weakness in broad money since the start of the recession. The third section examines the relationship between money and nominal spending over this period and considers what this may imply about the future path for the velocity of circulation. And the fourth section considers the incremental information that we can glean from the money data about the impact of the programme of asset purchases conducted by the Bank of England on behalf of the Monetary Policy Committee (MPC).

The determinants of broad money and the link with nominal spending

In order to understand movements in broad money, it is useful to distinguish between factors affecting the supply of money and factors affecting the demand for money. It is also important to consider the mechanisms through which money supply and demand are made equal.⁽¹⁾

The supply and demand for money

The supply of broad money is determined by transactions between the banking sector (including the central bank) and the non-bank private sector. The most important of these transactions historically has been the provision of credit by the banking sector to the non-bank private sector. When a bank or building society makes a loan to households or companies it automatically creates a deposit — either for the borrower, or for the recipient of the borrowers' expenditure if the loan is spent immediately (as in the case of purchasing a house, spending on a credit card or drawing on an overdraft facility). More generally, any transaction between the banking sector and the non-bank private sector will involve the creation or destruction of banking sector deposits and will thus affect the supply of broad money. For example, paying out dividends will create money when a bank credits shareholders' accounts with a deposit. Conversely, if banks retain profits that would otherwise have been paid to shareholders as dividends, this will reduce the supply of money. Issuance of long-term debt or equity by banks will also destroy money as asset managers purchase the instruments using their deposits.

The demand for broad money can be understood in terms of its two uses in the economy: first, it is used as a means of

(1) See Congdon (1992, 2005) and Berry et al (2007) for a more detailed discussion.

carrying out and settling transactions — its ‘medium of exchange’ role; second, it is also held as a financial asset in household and company portfolios — its ‘store of value’ role. So the demand for money is likely to depend on:

- (a) *the value of transactions in the economy* — nominal spending on goods and services and the value of asset transactions;
- (b) *the overall value of asset portfolios or ‘wealth’* — households and companies would be expected, other things equal, to hold a certain share of their portfolio in money;
- (c) *the relative rate of return on money* — the yield on money (deposit rates) compared to other assets will determine the share of the portfolio that households and companies choose to hold in money; and
- (d) *the degree of uncertainty* — households and companies may choose to hold higher money balances if either the economic outlook or their ability to access credit is unusually uncertain.

The adjustment of money demand and supply to shocks

It is useful to consider the mechanism through which money supply and demand are made consistent. If a set of transactions between the banking sector and non-bank private sector leads to a net increase in the supply of money, then one of the determinants of the demand for money — nominal spending, wealth or relative rates of return — must also move in order for households and companies to be willing to hold more money. Similarly, if there is a rise in the demand for money by households or companies then something must change to induce the banking sector to increase the money supply by lending more to those households and companies; or alternatively one of the other determinants of money demand must change to offset the original increase in demand.

The adjustment in the determinants of the demand for money may not happen immediately. According to standard economic theory, the demand for money by households and companies is a target level of money balances that they wish to hold on average over a given period. But they will often accept holding more or less than that amount in the short term as a (possibly very temporary) means of bridging the gap between payments and receipts. This is generally known as the buffer-stock theory of money demand.⁽¹⁾ The theory suggests that, in the short run, the aggregate stock of money is largely determined by supply factors and is only made consistent with the underlying demand for money over a longer horizon.

The link between money and nominal spending

The key issue for monetary policy is the extent to which shifts in money supply and demand lead to subsequent changes in

nominal spending (and ultimately inflation). On the one hand, a shift in either money supply *or* money demand may require a change in nominal spending to restore equilibrium. On the other hand, equal shifts in money supply *and* money demand may lead to no change in nominal spending, but instead result in a change in the velocity of circulation. The outcome will depend on the shocks that hit the economy and the time that they take to propagate.

For example, an increase in competitiveness within the banking sector (such as occurred in the 1980s and early to mid-2000s) is likely to lead to a permanent fall in the velocity of circulation. Greater banking sector competitiveness would act to lower the interest rate on bank loans and increase deposit rates. The resulting fall in the overall cost of financial intermediation for households and companies is likely to induce a substitution towards bank credit from alternative forms of finance, increasing the money supply for a given level of nominal spending. At the same time, the rise in deposit rates relative to the return on other assets will increase the portfolio demand for money. An increase in both the supply of and demand for money at a given level of transactions implies an increase in broad money relative to nominal spending and so a fall in the equilibrium velocity of circulation.⁽²⁾

In contrast, a programme of central bank asset purchases from the non-bank private sector is more likely to lead only to an adjustment in nominal spending in the medium term. In the first instance, a fall in the yields of non-monetary assets and a rise in their prices is likely to be required to persuade households and companies to hold a higher stock of money. The increase in money balances will initially lead to a fall in velocity. But the accompanying increase in asset prices will boost financial wealth and so is likely to contribute to an increase in nominal spending over time as wealth effects take hold. Much of the initial fall in the velocity of circulation is therefore likely to be temporary.⁽³⁾

In the next two sections, this money supply and demand framework is used to look at the determinants of broad money and its relationship with nominal spending over the recent recession. First, the determinants of broad money are examined from a supply perspective, using both an accounting and economic analysis. The next section then analyses the extent to which these movements in money supply have been associated with movements in nominal spending or movements in the velocity of circulation.

(1) See Laidler (1984) and Milbourne (1988) for a discussion of buffer-stock models.

(2) Nominal spending might also be affected by this shock. The move towards a more competitive banking system and greater financial intermediation might boost potential supply in the economy if it made possible investment projects that were not viable at a higher level of spreads. But how that would affect the price level and nominal spending would depend on the monetary policy response.

(3) For a discussion of the possible monetary transmission mechanism of central bank asset purchases, see Benford *et al* (2009).

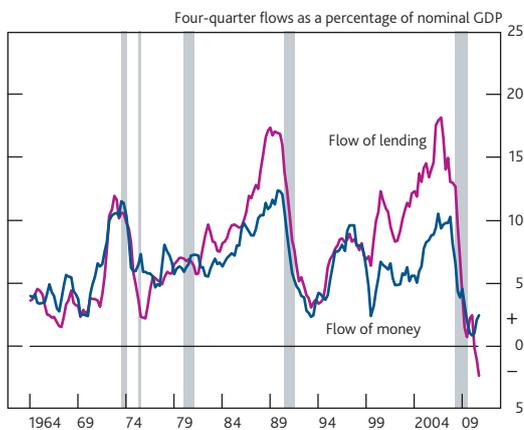
Factors affecting the supply of broad money

Counterparts analysis

Tracing through changes in the composition of the banking sector’s aggregate balance sheet can provide a useful insight into the factors affecting the supply of broad money. A change in the stock of broad money is a change to one component of the liabilities of the banking sector, and must have a counterpart elsewhere on the balance sheet: either a complementary change in the assets of the banking sector, such as loans advanced, or an offsetting change in the other liabilities of the banking sector, such as banks’ long-term debt or equity. This counterparts framework is discussed in more detail in the box on page 26.

In the past, money and credit flows have been tightly correlated — because the extension of loans mechanically creates deposits, credit has been a key counterpart to money (Chart 3). But that relationship is not exact and at certain times credit growth has exceeded money growth. During these periods some of the lending to households and companies is likely to have been funded by issuance of non-deposit liabilities (for example long-term bonds or securitisations) or deposits from non-residents. Changes in other counterparts to money can shed light on these issues.

Chart 3 Money and credit flows^{(a)(b)}

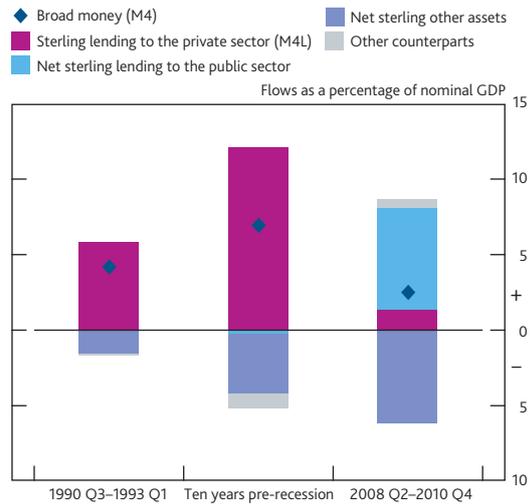


(a) Recession periods are shown in grey. Recessions are defined as in Chart 1.
 (b) Both money (M4) and lending (M4L) flows exclude transactions with intermediate other financial corporations (OFCs) where available. M4L is adjusted to exclude the effects of securitisation.

To analyse the recent weakness in broad money growth it is useful to compare the movements in money and its counterparts during the recent recession to those seen over the previous decade and in the early 1990s recession (Chart 4). During both these earlier periods, credit creation was the dominant counterpart to money growth. In contrast, there have been three principal counterparts to the recent weakness in broad money growth since the onset of the recent recession in mid-2008. First, sterling lending to the non-bank private sector (M4L) has been very weak, even relative to the 1990s recession, and, unusually, credit growth has not been

the main positive driver of money growth. Second, sterling non-deposit liabilities of the banking sector (such as equity and long-term debt) have grown markedly. This caused a sharp fall in net other sterling assets and was an unusually large drain on money growth. Third, net sterling lending to the public sector has been markedly strong, providing a highly unusual boost to money growth.

Chart 4 Counterparts to broad money growth^{(a)(b)(c)(d)}



Sources: Bank of England and Bank calculations.

(a) M4 and M4L are defined as in Chart 3.
 (b) Units give the average quarterly inflow into a given counterpart over the period specified, expressed as a percentage of average quarterly nominal GDP over that same period.
 (c) 'Net sterling other assets' adjusted to include changes in sterling liabilities stemming from loan securitisations.
 (d) 'Other counterparts' is given by residual, for more information on the counterparts, see Brunken and Westley (2002).

Economic factors

The three principal accounting counterparts to the recent weakness in broad money growth can be linked to three key economic developments. First, the financial crisis has been associated with a contraction in the supply of credit. Second, the need to stabilise the banking sector following the financial crisis led to significant balance sheet repair. Third, the severity of the recession led to a programme of asset purchases undertaken by the Bank of England on behalf of the MPC. Each economic development is addressed in turn and its impact on broad money estimated. These estimates are then compared with the principal accounting counterparts to the recent weakness in broad money growth.

I The financial crisis and weak bank lending

The financial crisis and subsequent recession were associated with a marked reduction in the flow of new lending to households and companies. As extending new loans creates deposits, weak lending was a key counterpart to weak money growth.

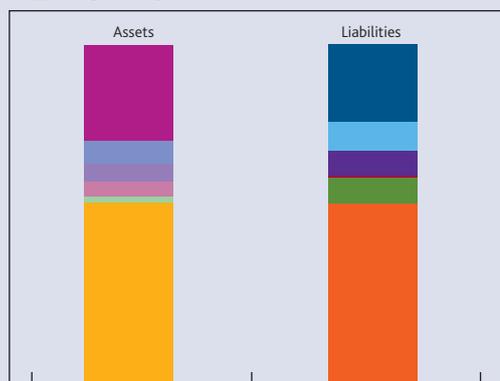
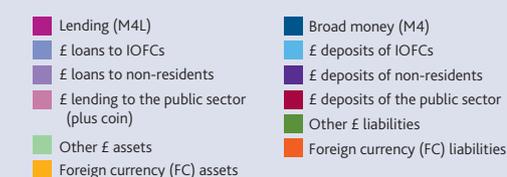
A substantial fall in the flow of new credit is not unusual during a recession and the early stages of recovery. But the lending slowdown in the recent recession has been particularly sharp and aggregate credit flows have reached an unusually low level

The counterparts framework for analysis of changes in broad money

In order to understand movements in broad money supply, it is useful to view them in the context of the balance sheet of the UK banking sector, specifically by examining changes in the counterparts to broad money.⁽¹⁾

Broad money is one major component of the liabilities side of banks' balance sheets. It accounts for about 23% of the UK banking sector's total financial liabilities (**Chart A**). Alongside broad money, a further 24% of total liabilities are denominated in sterling. That comprises sterling deposits from intermediate other financial corporations (IOFCs), non-residents and the public sector and also non-deposit liabilities, such as long-term debt and equity.

Chart A A stylised balance sheet for the UK banking sector^{(a)(b)(c)}



Sources: Bank of England and Bank calculations.

- (a) Bars are scaled to reflect the relative sizes of each component.
 (b) UK banking sector includes the central bank.
 (c) Lending (M4L) and broad money (M4) both exclude holdings of IOFCs.

On the other side of the balance sheet, the sterling financial assets of the UK banking sector mainly comprise loans to the non-bank private sector (M4L) and, to a lesser extent, loans to IOFCs, non-residents and the public sector. Sterling assets also include a small contribution from banks' holdings of other financial assets.

The remainder of the banking sector balance sheet is denominated in foreign currency and may typically be less relevant for explaining movements in broad money. The gross foreign currency assets and liabilities of the banking sector are large, reflecting the international operations of the largest UK banks. But banks appear to avoid large fluctuations in their net currency exposures over time. And it is that net position that is relevant in accounting for movements in M4.

Using this stylised balance sheet, changes in broad money can be mechanically accounted for by changes in the other components of the banking sector's balance sheet:

$$\Delta \text{Broad money (M4)} \equiv \Delta \text{Lending to non-bank private sector (M4L)} + \Delta \text{Net } \text{£} \text{ lending to IOFCs} + \Delta \text{Net } \text{£} \text{ lending to non-residents} + \Delta \text{Net } \text{£} \text{ lending to public sector} + \Delta \text{Net other } \text{£} \text{ assets} + \Delta \text{Net FC assets}.$$

This counterparts framework can be used to decompose the flow into broad money over any given time period. It can therefore provide an insight into the factors affecting broad money supply since the onset of recession.

relative to nominal GDP. The lending slowdown has occurred across all sectors: households, private non-financial corporations (PNFCs) and non-bank — or other — financial corporations (OFCs) (**Chart 5**).

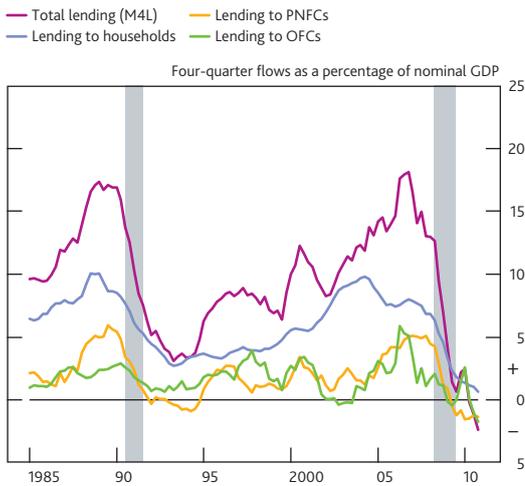
The unusually sharp slowdown in bank lending during this episode is likely to in part reflect the role of the financial crisis in instigating and propagating the recession. As the financial crisis intensified, credit supply was tightened as the banking sector increasingly sought to restrain balance sheet growth and improve the quality and profitability of new lending. That reflected a number of factors, including an increase in banking sector funding costs relative to Bank Rate and a reduction in

banks' risk appetite. This shock to credit supply appears to account for a large part of the slowdown in annual real bank lending growth since the recession began.⁽¹⁾

Not all of the slowdown in bank lending might be attributable to a credit supply shock. Demand factors may also have had a role. Weak activity and investment as a result of the recession are likely to have lowered the demand for new loans, despite the extraordinary monetary stimulus imparted by the MPC in response to the recession. However, it is difficult to assess the

(1) See Bell and Young (2010).

Chart 5 Sectoral credit flows^{(a)(b)}

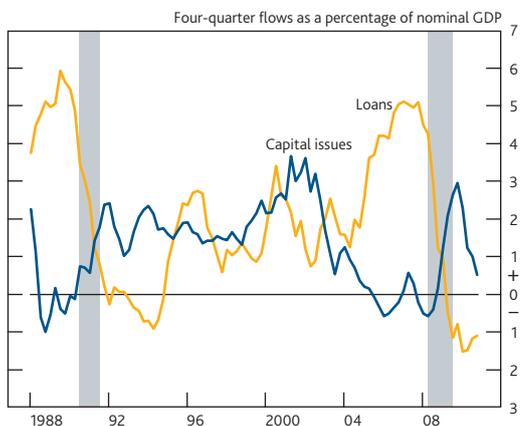


(a) Recession periods are shown in grey. Recessions are defined as in Chart 1.
 (b) Both total lending (M4L) and lending to OFCs exclude transactions with intermediate OFCs where available. All series are adjusted to exclude the effects of securitisation.

extent to which these factors weighing on credit demand would have occurred independently of tighter credit supply conditions.⁽¹⁾

Substitution towards alternative forms of finance provides one indication of tightness in the supply of bank credit. A worsening of the cost and availability of new bank loans makes capital market finance relatively more attractive. For instance, large PNFCs, with access to a variety of forms of finance, have substituted towards both bond and equity capital market finance since the onset of the recession (Chart 6). This disintermediation from the banking sector also occurred in the previous recession. But the scale and speed of substitution in this recession was somewhat greater. That may in part reflect a larger shock to the supply of banking sector credit following the recent financial crisis. But it might also reflect the impact of the MPC’s programme of asset purchases on the relative cost of capital market finance and the demand for credit. This

Chart 6 PNFCs’ substitution of bank debt to capital market issuance^{(a)(b)(c)}



(a) Recession periods are shown in grey. Recessions are defined as in Chart 1.
 (b) The loans series shows sterling net lending to PNFCs excluding the effects of securitisation.
 (c) The capital issuance series shows the net amount raised from sterling issuance of equity, bonds and commercial paper by UK PNFCs.

issue will be explored in more detail in the final section of this article.

Overall, the marked slowdown in aggregate lending appears consistent with the effects of a credit supply shock associated with the financial crisis and the effects of the ensuing recession. The weakness in credit creation was a key factor driving the recent weakness in broad money growth.

II Banking sector stabilisation

A second key factor that pushed down on money growth since the start of the recession was the net effect of the banking system’s attempt to repair the capital, funding and liquidity position of its balance sheet in the wake of the financial crisis.

In the third quarter of 2007 the global financial crisis began to affect the United Kingdom as conditions in financial markets, and bank funding markets in particular, deteriorated. As this intensified, and the global economic downturn gathered pace, realised and prospective losses for the UK banking sector increased sharply. These losses eroded capital levels in the banking sector, prompting major banks to rebuild capital levels by issuing additional equity (via rights issues) and also long-term non-equity capital instruments. The banking sector also sought to retain profits (rather than paying them out in dividends or staff compensation), in part to build provisions, but also to rebuild capital.⁽²⁾ The financial crisis also highlighted the reliance of the United Kingdom and global banking sectors on wholesale funding markets, and the subsequent vulnerability of major institutions to a change of sentiment in (particularly short-term) markets. As a result, lenders focused on increasing the duration of their liabilities by issuing long-term debt instruments.

Large-scale accumulation of these sterling non-deposit liabilities⁽³⁾ acted to bear down on money growth since the onset of the recession. Issuance of equity or long-term debt would have pushed down on money growth to the extent that the new instruments were purchased by the non-bank private sector, using sterling deposits. UK asset managers, such as insurance companies and pension funds, were significant purchasers of the increased issuance associated with the stabilisation of the banking sector. This issuance therefore acted as a negative shock to the supply of broad money. At the same time, accumulation of equity through the retention

(1) For a thorough discussion of both the supply and demand factors underlying the recent slowdown in bank lending, see Bell and Young (2010).
 (2) For detail on the capital raising undertaken by UK — and global — banks, see Bank of England (2008), page 32.
 (3) Not all sterling liabilities of the banking sector are included in the United Kingdom’s measure of broad money. Specifically, liabilities designed to absorb losses in the event of financial distress at a bank (ie equity and long-term non-equity capital instruments, so-called ‘hybrids’) and long-term bonds (with an original maturity greater than five years) are excluded, as these are not used to carry out transactions and are not considered close substitutes for less risky and more liquid deposits. These categories of banking sector liabilities are therefore termed ‘non-deposit liabilities’.

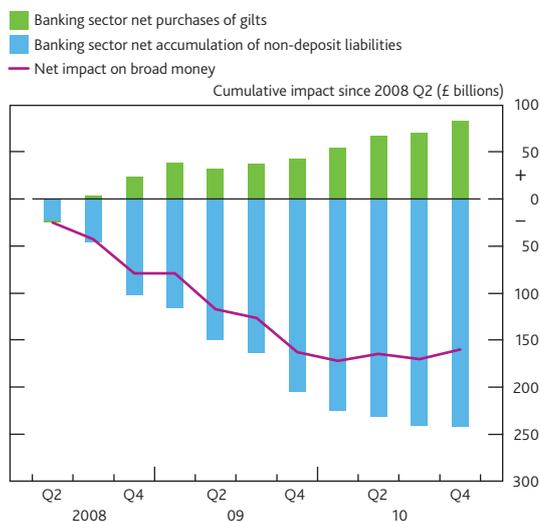
of pre-provision profits would also have dampened money growth, relative to a counterfactual where these profits would have been paid out as deposits to shareholders and employees in the UK non-bank private sector.

The total impact of the banking sector's accumulation of non-deposit liabilities on broad money is uncertain, but likely to be large. Data on the net issuance of sterling equity and long-term debt and private data collected by the Bank's statistical area on the retention of profits suggest that a reasonable estimate for the total drain on broad money from these factors was around £240 billion since the recession began. This estimate is uncertain — the figure could be larger or smaller for several reasons. For example, the figure could be larger if new issues of sterling long-term debt were not issued in public markets and so not captured in the data (so-called private placements). Or the figure could be smaller if not all the sterling equity and long-term debt was purchased by the UK non-bank private sector.

Increased regulatory pressure on banks to hold more liquid assets may have partially offset the drain on money induced by other aspects of banking sector stabilisation. Banks responded to stricter liquidity regulation by increasing their holdings of government bonds by about £80 billion since the start of the recession. If these were purchased from the non-bank private sector, this would have provided an offsetting boost to the money supply.⁽¹⁾

The overall net impact of banking sector stabilisation is likely to have been a drain on money holdings, representing an estimated negative money supply shock of around £160 billion (Chart 7).

Chart 7 Estimated net impact of banking sector stabilisation on broad money^{(a)(b)}



(a) 'Banking sector net accumulation of non-deposit liabilities' comprises net issuance of sterling equity and long-term senior secured (residential mortgage-backed security (RMBS) or covered bonds) or unsecured debt greater than five years in maturity at issue and pre-provision retained profits.

(b) 'Banking sector net purchases of gilts' excludes purchases of gilts by the Bank of England.

III MPC asset purchases (quantitative easing)

As the recession intensified during 2008, the MPC reduced Bank Rate sharply. By March 2009 the MPC cut Bank Rate to just 0.5% — the lowest level in the 300-year history of the Bank of England. Despite that, the MPC judged that further stimulus would be needed for the medium-term inflation outlook to be consistent with the 2% target. The MPC decided that the best way to loosen monetary policy further was to undertake a programme of asset purchases, in order to increase nominal demand and so inflation. The initial announcement was for asset purchases of £75 billion, but between March and November 2009 — in the face of a consistently weak outlook for medium-term inflation — the MPC increased the programme of asset purchases to £200 billion.⁽²⁾

The Bank of England purchased UK government bonds (gilts), and a small amount of corporate bonds and commercial paper. The aim was to purchase these assets largely from UK non-bank financial corporations, such as asset managers, with purchases settled via the banking system. Asset purchases would therefore increase broad money.

It cannot be certain that all assets were purchased from UK non-bank financial corporations: the banking sector or non-resident sector may have sold some of their gilt holdings to the Bank of England. In this case, the money balances of the non-bank private sector would not have risen, so the increase in money holdings may have been less than the programme of asset purchases.

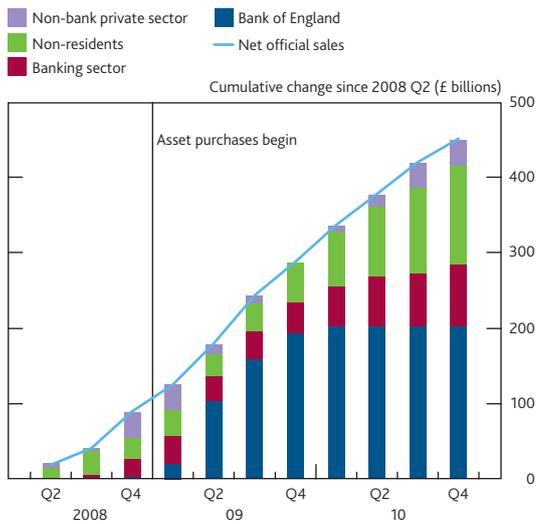
But the leakage of asset purchases outside of the non-bank private sector is likely to have been limited. First, the banking sector held relatively few gilts at the start of the asset purchase programme.⁽³⁾ Second, both the banking sector and non-resident sector actually increased their holdings of gilts during the period over which asset purchases took place (Chart 8). Indeed, over the period since the recession began, the proportion of total gilt issuance purchased by the banking sector and non-resident sector has been broadly in line with the proportions purchased between 1991 and 1993, when the fiscal deficit last rose sharply following a recession. In contrast, the non-bank private sector has barely increased its holdings of gilts when in the 1991–93 period it took up over half the gilts issued. It therefore seems unlikely that a significant proportion of asset purchases were purchased from outside of the non-bank private sector — so the impact on broad money was likely to have been close to £200 billion.

(1) Similarly, if these government bonds were bought directly from the Debt Management Office, that would have also boosted the money supply given that those government bonds would otherwise have been purchased by the non-bank private sector.

(2) The purchases were completed in January 2010.

(3) The UK banking sector's net holdings of UK government bonds at the end of 2008, prior to the onset of asset purchases, was £26 billion.

Chart 8 Change in gilt holdings by sector since the recession began^(a)



(a) Gilts acquired through asset purchases are held by the Asset Purchase Facility, a subsidiary of the Bank of England.

Summarising the impact of the economic factors

The three economic factors outlined above can broadly account for the weakness in broad money since the onset of the recent recession. They can also largely explain the movements in the principal counterparts to broad money over that period. The actual increase in broad money between 2008 Q2 and 2010 Q4 was £99 billion. **Table A** shows a mechanical decomposition of this money growth into its accounting counterparts. It also shows the quantitative estimates of the impact on money of each of the three economic factors and indicates which money counterpart they affected:

- (a) Weakness in lending was associated with a weak inflow into money of £55 billion. That estimate is simply set equal to the amount of lending actually observed, reflecting the conclusion that the financial crisis and credit supply shock can broadly account for much of the observed weakness in lending.
- (b) Banking sector stabilisation is estimated to have contributed to a net drain of money of around £160 billion. That consisted of about a £240 billion reduction in money holdings estimated from data on banking sector issuance of long-term debt and equity and retention of profits, in part offset by about £80 billion of gilt purchases by the banking sector over the period.
- (c) Asset purchases contributed to a net boost of money of £200 billion, assuming that the assets were purchased from the non-bank private sector.

Despite the ability to explain broad money growth in terms of just three key economic developments, there is significant uncertainty associated with each estimate. They should

Table A Accounting for broad money growth since the onset of the recent recession^{(a)(b)(c)}

Counterparts to broad money (M4)		Estimated impact of economic factors			Total
		Weakness in lending	Banking sector stabilisation	Asset purchases	
£ lending to the private sector (M4L)	55	55			55
- net £ non-deposit liabilities	243		240		240
+ net £ lending to the public sector	262		80	200	280
+ changes in other counterparts	26				
Change in broad money	99	55	-160	200	95

Sources: Bank of England and Bank calculations.

(a) The period covers 2008 Q2 to 2010 Q4.
 (b) The first column (unshaded) shows the accounting counterparts to money identified in **Chart 4**.
 (c) Each of the columns shaded blue show the estimated impact on broad money of one of the economic factors discussed in the text. The total impact of a given factor is shown in the bottom row and the other rows show which accounting counterparts were likely affected by that economic factor.

therefore be taken as indicative guides. For instance, it is impossible to estimate precisely the extent of the leakage of asset purchases to non-residents and the extent to which issuance associated with banking sector stabilisation was purchased by the non-bank private sector.

Money, nominal spending and the velocity of circulation

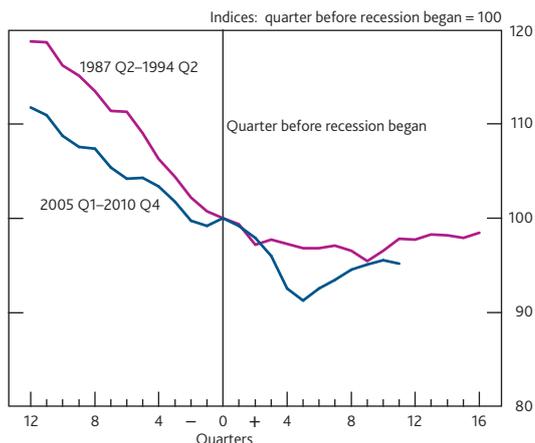
As noted in the introduction, understanding recent movements in the velocity of circulation is important for gauging the signal contained in weak broad money growth about future nominal spending. This section analyses the extent to which weaker broad money has been associated with lower nominal spending and how much has been absorbed in the velocity of circulation.

Understanding the recent velocity profile

It is possible to compare the recent behaviour of broad money velocity with that in the early 1990s, normalised on the quarter before the start of the recession for each period. The early 1990s period provides a useful counterfactual comparison as it represented a period of recession that followed a large expansion of the financial sector. In the 1990s recession, money growth fell rapidly and converged on the rate of nominal GDP growth, after which the two series continued to grow broadly in line for several years — the profile of velocity was thus fairly flat (**Chart 9**).

In the first few quarters of the recent recession, the behaviour of velocity was quite similar to the 1990s recession. But thereafter velocity followed a 'V'-shaped pattern. First velocity fell, which reflected a sharp fall in nominal spending in the first half of 2009, while money growth, although weak, remained slightly positive. Subsequently, velocity recovered, as nominal GDP growth picked up sharply relative to

Chart 9 Velocity compared to the 1990s recession^(a)



Sources: Bank of England and Bank calculations.

(a) Broad money velocity scaled to 100 in the quarter before the start of recession — that is 1990 Q2 and 2008 Q1 respectively.

continued weak money growth. During 2010 velocity returned to a similar level relative to the peak of the cycle as in the previous recession.

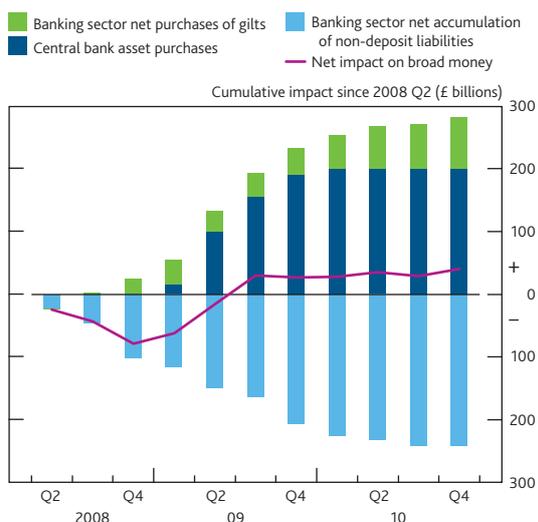
What might explain the V-shaped pattern of velocity? One potential explanation is the impact of asset purchases. As discussed earlier, a key component of the transmission mechanism of asset purchases is the portfolio rebalancing channel, based on the assumption that gilts and deposits are imperfect substitutes. Asset purchases initially required lower yields and higher asset prices in order for portfolio managers to be willing to hold the additional deposits created. In time, higher asset prices fed through into higher spending by households and companies. Nominal spending was therefore affected with a lag. So, other things equal, asset purchases should have led to an initial fall in velocity during the portfolio rebalancing phase, followed by a subsequent rise as nominal spending increased.

There are two caveats to this explanation of the recent V-shape in velocity. First, asset purchases cannot explain the large fall in velocity observed in 2009 Q1, as they did not begin in earnest until 2009 Q2. Second, banking sector stabilisation may have partially offset the impact of asset purchases on velocity. As discussed in the previous section, banking sector stabilisation is likely to have reduced money holdings significantly. If bank shares are considered imperfect substitutes for bank deposits, that may also have had a lagged effect on nominal spending via portfolio rebalancing channels. So the additional and opposing impact from banking sector stabilisation may have partially dampened the impact of asset purchases on velocity.

To gauge the behaviour of 'underlying' velocity over the period, a crude attempt can be made to strip out the net impact on the money supply from the combined effects of banking sector stabilisation and asset purchases. Since the onset of the

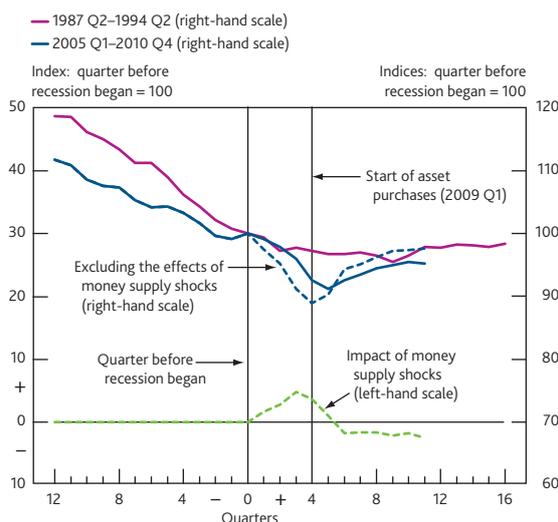
recession, banking sector stabilisation has acted to drain money. But since mid-2009, asset purchases more than offset that effect, such that the net shock to the level of money supply is estimated to have turned positive (Chart 10). This net money supply shock can be mechanically removed from the money stock and, making the assumption that the level of nominal spending is unaffected, an alternative 'underlying' path for velocity can be constructed (Chart 11). There are two features to note from the underlying profile that results.

Chart 10 Estimated net impact of banking sector stabilisation and asset purchases on broad money^{(a)(b)}



(a) 'Banking sector net accumulation of non-deposit liabilities' as defined in Chart 7.
 (b) 'Banking sector net purchases of gilts' excludes purchases of gilts by the Bank of England.

Chart 11 Velocity compared to the 1990s recession — stripping out the estimated net money supply shock^{(a)(b)(c)}



Sources: Bank of England and Bank calculations.

(a) Broad money velocity scaled to 100 in the quarter before the start of recession — that is 1990 Q2 and 2008 Q1 respectively.
 (b) The green line shows the net money supply shock relating to banking sector stabilisation and asset purchases, as set out in Chart 10, translated into velocity space.
 (c) The dashed blue line shows the underlying velocity profile when the impact of the net money supply shock is subtracted from the observed velocity profile.

First, a V-shape in velocity remains, but shows a somewhat sharper fall and subsequent recovery. So the trough in velocity is shifted earlier. The sharper V-profile may just reflect a

timing effect, exacerbated by the speed of the downturn. In the second half of 2008, nominal spending began to fall and then fell very sharply in early 2009 — a much sharper decline than seen in the 1990s recession. Given the costs to households and companies of adjusting credit and money holdings, this may have entailed a period when underlying money (after allowing for the effects of asset purchases and banking sector stabilisation), was still adjusting to lower spending in the economy. And given the economic uncertainty at the time, households and companies may have been content to hold a buffer of liquidity, especially if they were anticipating difficulties in obtaining credit in the future. As a result, the recovery in nominal spending in the second half of 2009 could be financed by drawing down those buffers, without households and companies demanding additional money.

The second feature to note is that the underlying profile of velocity has been fairly flat over the past year, especially if a lagged impact on nominal spending from the net money supply shock is also factored in. Over the past year, the fact that underlying velocity appears to have been broadly flat, at a level close to that implied by the previous recession, indicates that there has been no significant shift in the demand for money relative to spending. This may tell us something about the trend in velocity looking ahead, which will be important in analysing the implications of future broad money outturns for monetary policy.

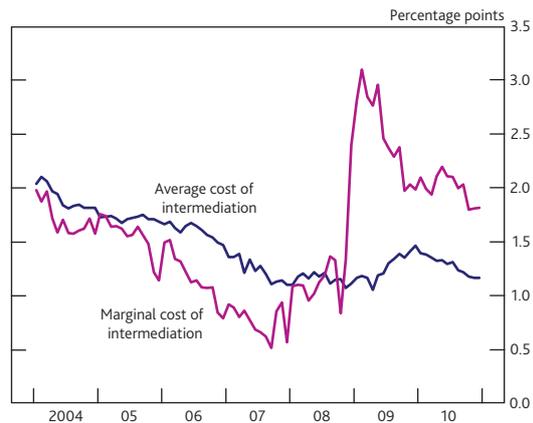
Prospects for velocity

Since the start of the 1980s broad money velocity has trended downwards, reflecting the growing importance of financial intermediation in the economy. That trend might be expected to reassert itself at some point. But the experience of the 1990s would suggest that the trend can be interrupted for an extended period, if the forces pushing up on velocity are persistent enough. Much depends on how the banking sector evolves and how that affects relative rates of return on borrowing and holding deposits. It is useful to distinguish between two types of relative rates of return. First, rates of return that lead to changes in money and credit for a given path for nominal spending — that is those that change the degree of financial intermediation undertaken by the banking sector. Second, rates of return that change the amount of nominal spending for a given path of money, reflecting shifts between the transactions and portfolio demands for money. The former depends on the cost of bank intermediation (the loan-deposit rate spread); the latter depends on the rate of return on deposits relative to other financial and tangible assets.

The evidence on the likely future cost of banking system intermediation is mixed. For PNFs, significant disintermediation was observed in 2009, facilitated by issuance on the capital markets (Chart 6). But the amount of

debt-equity substitution decreased in 2010, suggesting reduced incentives to disintermediate. For households, both loan and deposit rates have generally fallen by less than Bank Rate since the recession began.⁽¹⁾ But the spread between the *average* rate on the stocks of loans and deposits has not changed dramatically (Chart 12). For the average household, the cost of maintaining existing intermediation may therefore have changed relatively little over the course of the recession.

Chart 12 Average and marginal cost of intermediation for households^{(a)(b)(c)}



Sources: Bank of England and Bank calculations.

- (a) Cost of intermediation based on the loan rate to deposit rate spread. Loan rates are based on the weighted average interest rate on mortgages and personal loans. Deposit rates are based on the weighted average time deposit rate.
- (b) Average cost of intermediation calculated from the effective rate on the outstanding stock of loans and deposits.
- (c) Marginal cost of intermediation calculated from the effective new business rate on loans and deposits.

In contrast, there has been a significant increase in the *marginal* cost of intermediation for households — the rate on *new* lending relative to the rate of return on *new* deposits (Chart 12). That would give an incentive for households to intermedicate less via the banking system in the future — namely to pay down a proportion of maturing loans with deposits, rather than to refinance. There are signs though that this incentive may also have diminished somewhat over the past year.

The significance of disintermediation in the future will depend on how persistent the high marginal cost of intermediation proves to be. That in turn will depend on conditions in the banking sector and how loan and deposit rates respond to future changes in monetary policy. For example, the banking sector may seek to close the gap between the stock of loans and deposits, built up in the decade preceding the recession (Chart 3). In particular, banks may seek to replace maturing debt liabilities with retail deposits. That would likely require them to bid up deposit rates relative to other rates of return, which would increase money holdings relative to nominal spending.

(1) See Button *et al* (2010).

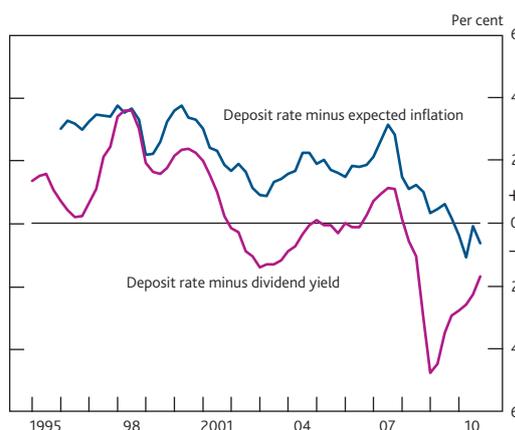
The likelihood of further disintermediation will also depend on the distribution of existing deposits and loans and on how many households and companies face refinancing their loans at high marginal borrowing rates. The extent that disintermediation will increase velocity relative to its downward historical trend is therefore hard to judge.

The outlook for velocity would also be affected if nominal spending were to change for a given amount of money holdings. There may be factors that provide an incentive for households and companies to mobilise existing savings deposits to finance more nominal spending — a process sometimes known as 'dishoarding'. The key factor determining the incentive to dishoard is the rate of return on deposits relative to other assets. If deposit rates are low relative to the return on financial assets (or the marginal utility derived from tangible assets such as consumer durables, housing and investment goods), there is an incentive for households and companies to try to run down their money holdings and substitute into these other assets. But money holdings cannot be reduced in aggregate unless some households or companies choose to repay bank debt. So, for a given level of intermediation, dishoarding would lead to money being passed around the economy between households and companies until asset prices and nominal spending rise (and asset yields fall) sufficiently to offset the initial incentive to reduce money. In this scenario, previously idle money balances become active and there is a shift between the portfolio and transactions demands for money. That would allow for greater money spending for a given level of aggregate deposits, pushing up on velocity relative to its downward historical trend.

Simple measures of the relative rate of return on deposits do appear to be historically low. That suggests an incentive to switch out of deposits (Chart 13). First, household time deposit rates are currently well below simple measures of the return on holding shares (the dividend yield). That is consistent with strong flows into retail unit trusts recently. Second, the nominal deposit rate has fallen significantly below measures of the rate of inflation expected by households. Other things equal, this fall in real deposit rates suggests a fall in the rate of return on holding money relative to holding real assets such as consumer durables and housing.

These simple measures do not, however, capture the total rate of return on holding alternative assets to deposits. In particular, expected capital gains on financial assets and expected changes in the relative price of tangible assets over the relevant investment period are also important. The relative riskiness of holding alternative assets compared to holding a bank deposit should also be considered. These expectations and perceptions of risk are very difficult to measure. To the extent that expected capital gains on assets such as equities and housing have also fallen over the recent period, or if the perceived riskiness of holding them has

Chart 13 Relative return on household deposits^{(a)(b)}



Sources: Bank of England, Barclays Capital, Thomson Reuters Datastream and Bank calculations.

- (a) Deposit rate minus expected inflation is defined as the quoted rate on one to two-year fixed-rate bonds minus one year ahead household inflation expectations from the Barclays Basix survey.
 (b) Deposit rate minus dividend yield is defined as quoted time (30–90 day notice period) deposit rate minus the quarterly average dividend yield on the FTSE All-Share index.

increased, that would mean the incentives to dishoard are less than the simple measures suggest.

The actual path of velocity may deviate from the underlying path of velocity because of the impact of money supply shocks. For instance, the banking sector may continue to recapitalise at the expense of deposits.⁽¹⁾ Observed velocity may also increase relative to trend if lagged effects on nominal spending from past money supply shocks continue to come through. The final section looks at what the recent money data might have told us about the impact of these money supply shocks on asset prices and nominal spending in the economy.

Has the recent behaviour of money revealed anything about the transmission mechanism?

The analysis in the second section suggested that three factors can broadly account for the behaviour of broad money since the outset of the recession — asset purchases, weak credit creation and the stabilisation of the banking sector. So far, these have been treated as independent shocks. But weaker credit growth and stronger bank issuance may both have been partly influenced by asset purchases.⁽²⁾

For instance, both companies and banks may have been able to issue more equity and long-term debt than otherwise as a result of the higher asset prices and lower yields induced by asset purchases. Companies and banks may have used this issuance to lower their bank debt and deposit liabilities respectively. These channels would both work to reduce the

(1) In the longer term, a well-capitalised banking system with longer-term sources of funding might be expected to foster a greater willingness to lend and hence boost money growth further out.

(2) As discussed in Dale (2010), there are a number of ways through which asset purchases might affect the economy.

initial money supply impact of asset purchases. But both are ultimately useful in strengthening the balance sheets of the banking and corporate sectors, which may facilitate higher investment and increased bank lending in the future.

The extent to which increased issuance of debt and equity by banks and companies was facilitated by asset purchases is uncertain. Issuance may have occurred in the absence of asset purchases. For instance, companies also substituted bank debt for capital issuance in the previous recession, albeit to a slightly lesser extent (Chart 6). And it is likely that banks would have had to issue more equity to improve their capital position, even in the absence of asset purchases.

If asset purchases have helped to facilitate balance sheet repair for the banking and corporate sectors, that would reduce the initial impact of asset purchases on asset prices. By allowing greater issuance on the capital markets, the overall impact on money from asset purchases would have been reduced. Financial companies (such as asset managers) would have had to absorb less money into their portfolios. So a smaller asset price effect would therefore have been required to accommodate this smaller absorption of deposits.

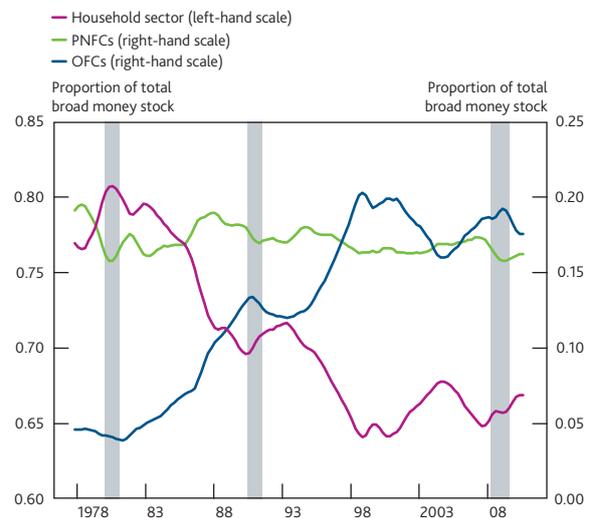
Using empirical estimates of financial companies' money demand, it is possible to estimate the extent to which financial yields and prices would have had to adjust to absorb a given increase in their money holdings. It is then possible to estimate the implied increase in the money supply that would be consistent with the asset price effect of asset purchases, estimated in previous Bank of England work based on event study and econometric analysis.⁽¹⁾

A money supply increase of around £45 billion–£90 billion would be consistent with the estimated asset price impact of asset purchases derived from other studies (for more detail see the box on page 34). That is broadly consistent with the increase in the money supply that occurred over the period of asset purchases, when the effects of bank stabilisation and PNFC capital market issuance over the same period are taken into account. Although uncertain, a money supply and demand analysis would therefore provide some support for the range of asset price increases attributed to asset purchases in other studies.

Further evidence on the transmission mechanism of asset purchases might be found by looking at sectoral money holdings. Asset purchases would suggest that there should be an initial increase in the share of financial companies' money holdings in broad money as asset managers sold assets to the Bank of England. But over time this share should have declined as companies and households responded to higher asset prices by increasing their spending, and obtaining the money required to finance it by issuing shares to the financial company sector or, in the case of households, liquidating investments with them.

The pattern of sectoral money holdings in 2009 and 2010 has been broadly consistent with the expected transmission of asset purchases (Chart 14). But careful interpretation of changes in sectoral money holdings is needed. Some of the sectoral shifts in money may have been expected in the absence of asset purchases. For example, the financial companies' money share has in the past tended to decrease at the expense of other sectors during recessions. That might have been due to the increase in the cyclical component of the budget deficit that typically occurs in recessions. Increased benefit payments to households and concessions on company taxation that were financed by increased government borrowing from the financial sector would be expected to have led to a rise in the share of non-financial companies' and households' money holdings at the expense of asset managers. That might explain part of the fall in the share of financial companies' money in 2010.

Chart 14 Sectoral shares of the broad money stock^{(a)(b)(c)}



(a) Recession periods are shown in grey. Recessions are defined as in Chart 1.
 (b) Shares based on four-quarter moving average of the break-adjusted stocks.
 (c) Money shares calculated excluding the holdings of intermediate OFCs where available.

Conclusions

The recent weakness in broad money growth may be explained by the weakness of bank lending arising from the recession and the impact of banking sector stabilisation. These two factors have been offset by the positive impact of asset purchases on broad money.

The circumstantial evidence from the money data broadly corroborates the estimates of the net impact of asset purchases on asset prices from other empirical work. Sectoral evidence also suggests that asset purchases are broadly working via the balance sheets of households and companies to contribute to an increase in nominal spending.

(1) For more information on the financial market impact of asset purchases, see Joyce *et al* (2010).

Cross-checking the impact of asset purchases on asset prices

The impact of asset purchases on asset prices depends on portfolio rebalancing by asset managers or 'non-intermediate OFCs' such as insurance companies and pension funds. It assumes that these investors view bank deposits as an imperfect substitute for other financial assets such as gilts and equities. Their demand for money will depend on the overall value of their portfolio as well as the rate of return on deposits relative to the yields on gilts and equities. So institutional investors require asset prices to rise and gilt and other financial yields to fall in order to be willing to hold the additional deposits created by asset purchases in their portfolios. That can be summarised according to the following relationship:

$$\begin{aligned} &\text{Percentage change in money demand} \\ &= \\ &\text{Percentage change in the value of financial company assets} \\ &+ \\ &\theta * \text{Percentage point change in (deposit rate – yield on other assets)} \end{aligned}$$

where θ is a measure of how substitutable deposits are for other assets — the semi-elasticity of money demand with respect to the opportunity cost of holding a deposit. How much financial asset prices and yields need to change to persuade institutional investors to hold more money depends on θ . If θ is zero then deposits and other assets are perfect complements and money must be held in strict proportion to the value of the overall portfolio. So the percentage change in asset prices must be equivalent to the percentage increase in institutional investors' money holdings implied by asset purchases. If θ is a very large number, deposits and other assets are close substitutes and very little change in asset prices and yields is required for these financial companies to hold more money. Using this relationship and an estimate of θ from the data, the estimated impact of asset purchases on asset prices (derived in other studies) can be cross-checked for consistency with the money supply movements that can be reasonably attributed to asset purchases.

The results of Joyce *et al* (2010) suggest that asset purchases may have lowered gilt yields by around 1 percentage point (and correspondingly increased gilt prices by approximately 10% assuming a ten-year average duration); they also may have had a potentially large, but highly uncertain, effect on equity prices of between 20% and 70%. That would suggest a lower bound increase of around 10%–20% in financial company asset values. Empirical estimates of θ from simple models of financial institutions' money holdings are in the range of 5–10. So a fall in yields of 100 basis points and an increase in asset values of 10%–20% would be consistent with

financial companies willing to increase their deposit holdings by 15%–30%. Non-intermediate OFC money holdings were approximately £300 billion during the period over which asset purchases took place, so that would represent a willingness to hold an additional £45 billion–£90 billion in deposits.

Table 1 below suggests that this range encompasses a lower bound estimate of the increase in the money supply that could reasonably be attributed to asset purchases, once the effects of banking sector balance sheet restructuring and PNFC disintermediation (bond, equity and commercial paper issuance) are taken into account. As suggested in the main text, it is plausible that these additional factors may have been related to the programme of asset purchases. **Table 1** shows an estimate of the money supply impact if all of the impact of banking sector stabilisation and PNFC disintermediation over the asset purchase period is assumed to be related to asset purchases. Assuming that less of the impact of banking sector stabilisation and PNFC disintermediation is attributable to asset purchases would be consistent with a money supply impact approaching £200 billion and an overall asset price increase approaching the 70% upper bound estimate of Joyce *et al* (2010).

Table 1 Money supply impacts that could reasonably be attributed to asset purchases^(a)

	£ billions
Direct effect of asset purchases	+200
Banking sector stabilisation	-90
PNFC bond, equity and commercial paper issuance	-40
Lower bound estimate of money supply increase attributable to asset purchases	70

(a) Note that, unlike **Table A**, the quantities here apply only to the period over which asset purchases were made.

Overall, this suggests that the range of estimates of the asset price impact of asset purchases from Joyce *et al* (2010) are broadly consistent with the range of estimates arising from a money supply and demand approach.

The experience of the 1990s suggests that velocity's long-run downward trend can be interrupted for extended periods of time. The recent conjuncture suggests that there are economic factors pushing up on velocity relative to its historical trend. These are likely to persist in the near term, suggesting that a given rate of growth in nominal spending is likely to be associated with weaker growth in broad money than was typically the case before the crisis. Developments in the banking sector and the relative

rates of return on money and credit will be important determinants of whether and when the downward trend in underlying velocity is restored.

Should money growth continue to remain weak, then analysing the causes of this, using the types of analysis employed in this article, will be important in judging whether that weakness is signalling weak nominal spending growth in the future.

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