Basel III: is the cure worse than the disease?

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Abstract

Basel III will force banks to shift their business model from liability management, in which business decisions are made about asset volumes, with the financing found in short term wholesale markets as necessary, to asset management, in which asset volumes are constrained by the availability of funding. We find, contrary to what many have argued, that once there is a full adjustment, the costs of credit to low risk bank borrowers – the majority of customers – will be only moderately affected; but that there will a reduction in availability and higher cost at the riskier end of the credit spectrum. Alternative arrangements are therefore needed for financing of risky exposures if a fall in economic growth is to be avoided. In this context securitisation (broadly defined to include all forms of bank sponsored securitisation instrument, including covered bonds) will be of central importance. Re-establishing securitisation markets on a sounder footing appears essential, in order both to prevent a renewed credit contraction and to help prevent riskier borrowers from being cut off from credit. The shifts in bank balance sheets will also require substantial portfolio adjustments amongst long term institutional investors, from short term to long term debt and from debt to equity. The associated adjustment of both market prices and required returns can be accommodated but poses a substantial co-ordination problem and could take a long time. Finally the new liquidity rules could create new unintended systemic risks. In particular the proposed definition of eligible liquid assets is dangerously over-concentrated on government debt. The definition of should be broadened to give banks more scope to hold liquidity in the form of commercial claims; and central banks should clarify in what circumstances they will provide emergency liquidity assistance.

Keywords: asset liability management, bank capital, bank regulation, cost of bank capital, liquidity requirements

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1. Introduction

Following the global financial crisis, the G20 and the Basel Committee on Banking Supervision are proposing a range of new bank capital and liquidity regulations, which have become generally referred to as 'Basel III'.[2] In addition a number of further measures, for example bank levies to recoup the costs of support to the banking system during the crisis, are being proposed by individual countries. According to statements released by the G20, e.g. the communiqué from their Finance Ministers meeting of June 5th, 2010, their intention was to introduce these new regulations by 2012. In their communiqué of July 26th 2010, the Basel Committee announced some adjustments to both the substance of the measures and the timing of their introduction.[3] On 12th September 2010, the Basel Committee announced definitive new capital and liquidity ratios, and the dates at which they would be introduced[4]. In addition, the emergency liquidity provided to banks during the depths of the crisis will be withdrawn over the next few years and banks will need to find liquidity to make the necessary repayments.

Once implemented, these new regulations will effect a major change in the banking industry, not least in the United Kingdom. They will end the practice of asset-driven liability management, in which banks compete aggressively for market share in lending markets on the assumption that they can find the necessary funding in wholesale markets. Instead banks will have to revert towards the kind of liability-driven asset management that characterized banking in the 1960s, before global financial de-regulation and the widespread removal of foreign exchange controls. In other words, their balance sheet size will be determined by their ability to attract funding, and not by their ability to find assets.

This change is quite intentional. It requires major changes in business models and financial structure. It will be a major challenge to unwind changes to the industry that have been in train for nearly forty years in the two year time scale that the regulators seem to have in mind.

The objective of our paper is to explore some of the structural and institutional barriers that need to be overcome, if this major change in the banking industry is to be put into effect with

[2] See BCBS 2009b and 2009c.

[3] See BCBS 2010a.

[4] See BCBS 2010b.

minimal damage to the economy. The structural and institutional barriers that must be addressed include both changes in policy (e.g. to central bank liquidity policies such as the provision of discounting and of lender of last resort) and in the structure of the financial sector (e.g. a shift in exposure to relatively risky loan exposures from banks to long term institutional investors may be appropriate.)

We argue that if the pace is forced regardless of economic and business impact, and without thinking through all these necessary complementary changes, then the recovery from recession could be unnecessarily retarded, or, worse, there could be a further contraction. If that happened, the cure would turn out to have been worse than the disease.

We are not saying that the proposed regulatory reforms should be opposed. The main points that we wish to make are as follows:

- Basel III will force banks to shift their business model from liability management (make business decisions about asset volumes and finding the financing in short term wholesale markets as necessary) to asset management (asset volumes are constrained by the availability of long term funding).

- We look closely at the impact of Basel III on the cost and availability of bank credit, finding, contrary to what some have argued, that *in the long run* (once there is a full adjustment) the costs of credit to most bank borrowers will be only moderately affected, implying only a modest impact on the level of output (and indeed it is possible that the eventual impact is a small fall in the costs of credit and rise of output); but that there will a reduction in availability and higher cost at the riskier end of the credit spectrum. Alternative arrangements are needed for financing of risky exposures if a fall in economic growth is to be avoided.

- In this context securitisation is of central importance.[5] Shortcomings in securitisation instruments and processes were key causes of the global financial crisis. But re-establishing securitisation markets on a sounder footing appears essential in order both to prevent a renewed credit contraction and to help prevent riskier borrowers from being cut off from credit.

- Implementation of Basel III will require substantial portfolio adjustments amongst long term institutional investors, in order to accommodate the shift in bank balance sheets.

[5] Securitisation is the issue by banks of collateralised debt instruments such as covered bonds and mortgage backed securities ,and the sale of loans and other risky exposures.

Long term investors will need to shift from holding short term to long term bank debt and from debt to equity; and to absorb the securitized exposures of banks. The associated adjustment of both market prices and required returns can be accommodated but this will take time and presents a substantial co-ordination problem, since individual investors will only be comfortable with these changes if they are confident that other investors will accept them as well.

- The new liquidity rules could create new unintended systemic risks. In particular the proposed definition of assets eligible to be treated as liquid under the proposed liquidity regulations is dangerously over-concentrated on government debt. The definition of acceptable liquid assets should be broadened to give banks more scope to hold liquidity in the form of commercial claims. The authorities should also clarify how liquidity will be obtained in times of crisis: bank regulators need to ensure that the rules are flexible enough to allow banks to access market liquidity, either from the sale of assets or through short term borrowing; and the central bank needs to state in what circumstances it would provide emergency liquidity assistance to supplement bank access to market liquidity.

- Finally we emphasise the substantial size of the required change to bank balance sheets and business models is substantial. The transition to a new equilibrium is likely to be protracted and that the macro-economic effects of the changes are highly uncertain, particularly in the short term. The phasing of the transition (for example the timing of the introduction of the new minimum ratios and of the withdrawal of the special liquidity assistance provided during the crisis) should be managed flexibly as an integral part of the normal process of monetary policy management by monetary authorities such as the Bank of England Monetary Policy Committee.

Our analysis is presented as follows. Section 2 reviews some current analyses of the balance sheet impact of the new regulations, focusing on UK banks. It finds that there is a wide range of views on the scale of impact, but a consensus that balance sheet constraints are likely to operate for some time to come.

Section 3 then considers the desired end-point. We suggest that the long term impact of the new arrangements on the level of output need not be as great as many have supposed. Required returns on long term debt and on equity will fall, so the impact of the changes on the costs of bank intermediation will be considerably less than suggested by a simple comparison of interest rates and required returns on equity. But this requires that the 'buy side' of the market – investors in bank debt and equity – fully understand the changes in balance sheet structure and required returns that are consequent on the adoption of the new regulations. In addition

there need to be workable arrangements for the financing of relatively risky credit exposures, whether on bank balance sheets or through some forms of non-bank lending. Finally there also needs to be a major shift in the management of liquidity risks. Liability management will become much harder for both banks and their customers, and banks and their customers will all need stocks of liquid assets, not only to satisfy the Basel III regulatory requirements but also for actual use in managing cash flow.

Section 4 discusses the transition. This focuses on the argument, widely made by the banking industry, that they simply cannot raise the long-term debt and equity funding implied by the new regulations and hence will be forced into a massive balance sheet contraction. The official response has tended to view this as special pleading, since if markets are working well it should always be possible to raise these funds at an appropriate price. It no doubt will be possible to find investors willing to provide longer-term or equity funding for the banks but it is likely to take time and could in the short term be relatively expensive. In any case, the extent of regulatory and macroeconomic uncertainty must be a major inhibition to investors considering either long-term lending to banks or equity investment in them. In other words there is a serious transitional issue.

Section 5 summarizes and concludes.

2. The balance sheet challenge

The regulatory changes proposed in the Basel consultation documents of December 2009 and finalised in the communiqué of September 12th 2010 will, once implemented, impose liquidity requirements on banks for the first time and substantially tighten existing capital requirements. This section assesses the impact of these regulatory changes on the balance sheets and loan assets of UK banks, drawing on several recent analyses of the impacts of the new regulations.

While there are a wide range of estimates of the impact of the new requirements, it seems clear that the combination of new liquidity regulations and the repayment of expiring UK special liquidity facilities will put pressure on the balance sheets of many of the major UK banks. They will have to respond by some combination of reducing loan assets, including commercial loans; increasing eligible liquid assets, and increasing their funding from equity, long-term debt and stable customer deposits, so as to improve their positions under the Liquidity Coverage Ratio (LCR) and Net Stable Funding Ratio (NSFR).

The Basel Committee's initial proposal was that all the new capital and liquidity requirements would be implemented by the end of 2012.[6] However, their final decision was to phase in the new requirements relatively slowly, so that they will be fully in force in all participating countries by the beginning of 2019.[7] The new capital requirements will be gradually phased in over a six year period from January 1st 2013. The LCR, requiring banks to hold sufficient high quality liquid assets to survive a one-month run-off of short term liabilities, will be introduced on an observation basis only from January 2011, and become a regulatory requirement on 1st January 2015.[8] The net stable funding ratio is to be modified (this modification is due to be announced by December, 2010), introduced on an observation basis from 1st January 2012, and a regulatory requirement from 1st January 2018.

In our view a longer transition period is indeed desirable. According to analyses conducted by investment banks, in order to meet the NFSR by the end of 2012, as originally proposed, and repay the central banks, European commercial banks would have had either to raise very large amounts of new long-term funding, to increase their stable deposits, or to reduce their assets.[9] Banks in any case have to repay the special liquidity assistance extended by central banks during the crisis. It is doubtful whether the required amounts of long-term funding or stable deposits could have been raised by the end of 2012, and it would plainly have been undesirable for commercial banks to be obliged to cut back on lending while the world economy is recovering from a serious recession.

But, even though a long adjustment period is now to be allowed, markets are likely to anticipate the required changes and penalize banks that fall substantially short of the LCR and NSFR liquidity requirements, i.e. they may well have to increase the liquidity of their assets and reduce the liquidity of their liabilities, well ahead of the implementation timetable announced by the Basel Committee.

Investment bank analyses of the Basel Committee announcement of September 12th are not yet available, but one estimate of the order of magnitude of the required adjustment by UK banks

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[6] See BCBS (2009a).

[7] The implementation timetable is given in Annex 2 of the press release of September 12th, BCBS (2010c)

[8] It appears also that the BCBS is making some modifications to the LCR, recalibrating the calculations of runoffs within a one month period, allowing 40% of liquid assets to be non-financial corporate and covered bonds and riskier sovereign debt (subject to a 15% haircut). There has been no press release on these changes issued by the BCBS, but they are outlined in a presentation on the ECB website, found at http://www.ecb.int/paym/groups/pdf/mmcg/Amendments_BCBS.pdf?4a98a2d41af00e3e7546284b58431a7a

[9] See Barclays Capital (2010), Citigroup (2010), Credit Suisse (2010)

is the 'customer funding gap', which is defined as the difference between customer loans and deposits and is regularly estimated by the Bank of England[10]. According to the Bank of England's calculations, UK banks' customer funding gap was £ 841 billion at the end of 2008, having risen from £72 billion at the end of 2001. The gap at the end of 2008 was the equivalent of about 12% of total bank assets (including foreign currency assets and loans to all sectors). Almost all of the customer funding gap will eventually have to be financed long-term, instead of, as in previous years, from a mixture of long-term and short-term debt.

In addition to increasing their net stable funding, banks in the UK will have to repay the special liquidity facilities provided to them during the crisis. The Special Liquidity Scheme enabled them to swap high-quality but then-illiquid collateral assets for Treasury bills, in exchange for a fee. As at the end of January 2009, when the scheme was closed to new applicants, £185 billion of Treasury bills had been issued.[11] The Credit Guarantee Scheme provided, in exchange for a fee, a government guarantee for wholesale borrowing by banks. As at the end of February 2010, £125 billion of debt issued under the scheme was outstanding, nearly all of which was due to mature in 1 – 3 years.[12] We do not regard the possibility of sales of government securities by the Bank of England, as and when it reverses the purchases made under its Quantitative Easing programme, as putting pressure on banks' liquid assets, since such sales would simply force the banks to exchange one kind of liquid asset (cash) for another (government securities).

Capital requirements, too, will be tightened. There are several aspects to this:

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[10] See Bank of England (2009a) page 29.

[11] For details of the Special Liquidity Scheme, see Bank of England market notice Special Liquidity Scheme (SLS_DOC1.pdf) http://www.bankofengland.co.uk/markets/marketnotice090203c.pdf and updated market notice : Special Liquidity Scheme (SLS_DOC2.pdf)
http://www.bankofengland.co.uk/markets/marketnotice090925sls.pdf.

For other information about how the Bank of England provided liquidity during the financial crisis, see the following Bank of England market notices:

Sterling monetary framework; Extended-collateral long-term repo; Discount window facility; US dollar repo operation; Special Liquidity Scheme: summary of changes (SLS_DOC3.pdf)
http://www.bankofengland.co.uk/markets/marketnotice090925.pdf ;
Quick reference guide for participation in the special liquidity scheme after the end of the drawdown window (SLS_DOC4.pdf)
http://www.bankofengland.co.uk/markets/sls/sls_drawdown_userguide.pdf ;
Discount window facility (DWF_DOC1.pdf)
http://www.bankofengland.co.uk/markets/marketnotice090119.pdf

[12] See DMO (2010).

1. There will be tighter rules on the calculation of capital and asset risk. - At consolidated group level, for example a smaller proportion of capital in wholly owned insurance subsidiaries will count towards total group capital. Changes in the calculations of risk-weighted assets (RWA) will substantially reduce capital ratios. These include prospective increased risk weighting for stressed VaR (corresponding to extreme market conditions such as 2007-2008), for changes in market values of credit exposures, for counterparty risk, and for retained exposure to securitizations. These changes will result in large increases in RWA and corresponding falls in capital ratios (for example Credit Suisse estimate that overall these changes may increase RWA for UK domestic banks by around one-third)
2. The regulators are moving to a regime in which primary attention is paid to common equity, the best quality Tier 1 capital. Under Basel II, there was no requirement on common equity, but (taking account of the increase in RWA, and of typical shares of common equity in total Tier 1 capital) the Basel II requirement on level of common equity can be taken to have been about 2% of RWA. Under Basel III this minimum requirement to 4.5%.
3. The tier 1 capital ratio, which played a central role in Basel II, will also increase, to 6% of the new (higher) level of RWA. The non-equity part of tier 1 capital can be non-equity debt which converts into equity at some defined trigger point (of which at present in the UK Lloyds Banking Group Enhanced Capital Notes are the main example; these convert to equity if the core tier 1 ratio falls to 5%).
4. In addition, banks will have to hold a capital conservation buffer of 2.5%, in the form of common equity. It can be drawn on in times of stress, but if it is drawn on, the bank's ability to distribute earnings will be constrained.
5. Banks will also have to hold a countercyclical buffer in common equity of up to 2.5% at the discretion of national regulators, with the intention of protecting the banking sector from periods of excess credit growth'.
6. Banks which are regarded as 'too big to fail' are likely to be subject to additional capital requirements which are yet to be announced.
7. Finally a minimum tier 1 leverage ratio of 3% is to be 'tested', with a view to introducing a minimum leverage ratio as from 2018. , This will potentially create an additional binding capital constraint on institutions with substantial exposure to low risk weighted assets, such as traded securities or mortgage lending.

Will UK banks face difficulties in meeting these more demanding capital requirements*?* The markets already have encouraged banks worldwide to do a great deal to repair their balance sheets. Even with substantial writedowns and credit impairments, tier 1 equity ratios of the major UK banks have increased substantially, at least on the old Basel II basis (Credit Suisse report increases from end-2008 to end-2009 of 6.2% to 8.4% at Lloyds Banking Group, from 6.8% to 11.2% at Royal Bank of Scotland and from 7.1% to 10.6% at Barclays.) It is not yet known how quickly the new minimum ratios will be introduced in individual countries[13]. Recent capital increases notwithstanding, various analysts' reports suggest that constraints on capital are at least a possibility, at least for some banks:

(a) JP Morgan (2010) estimated, before the final communiqué from the Basel Committee was released, that if all the new capital requirements that they expected were introduced as from 2012, this could require the world's largest banks to increase their tangible equity by nearly 20% above the levels that will be achieved 'naturally' through retention of earnings by end 2011 . Thus there would be a very significant capital constraint.

(b) A more detailed "bottom up" UBS analysts report (2010a), based on balance sheet calculations for the world's largest 193 banks, again compiled before the final Basel Committee communiqué was released and based on expected increases in capital requirements to be introduced as from 2012, reaches qualitatively similar conclusions, finding that international banks could have to raise between $129bn and $375bn in equity, over and above what they could build up from retained earnings by the beginning of 2012. This would raise average core Tier 1 capital from a projected 8% to between 8.2% and 8.6%. Their analysis suggests that UK banks might have had to raise between $18bn-$60bn in additional equity, over and above what could be achieved through retention of earnings ($18bn if the banks can operate with a core tier 1 equity ratio of 6%, $60bn if markets and regulators require 8%).

(c) The Credit Suisse analysis of UK banks estimates that, with flat balance sheets, and allowing for all the increases in risk-weighted assets expected before the final Basel committee communiqué and the impact of retained earnings, Lloyds Banking Group, RBS and Barclays, would attain core tier 1 equity to risk weighted assets ratios of 6.1%,

[13] The dates specified in BCBS (2010c) are the latest dates by which the new minimum ratios are to be introduced. Individual supervisory authorities are free to introduce them before the specified dates.

6.3% and 7.9% respectively by end-2012; so again at least for RBS and Lloyds there is the possibility that lack of equity capital could constrain balance sheet expansion.

(d) More recently but before the September 12th announcement, UBS (2010b) commented that 'a higher minimum core Tier 1 level of 7%, by YE 2012, would sharply raise the amount of capital banks [worldwide] would need to raise to US$84bn,or 2.0% of market capitalization. Should the implementation date be pushed back to the end of 2013…then the recap needs would decline to… US$70bn..'. The minimum core equity ratio, announced by the Basel Committee on September 12th , is indeed 7% but the phase-in is very gradual, with a requirement of only 4.5% by January 1st, 2015 and reaching its final value of 7% only by January 1st, 2019 (see BCBS 2010b Annex 2 for details of the phase-in). In effect the Basel Committee is giving sufficient time for most banks to raise the bulk of their additional capital through retention of earnings.

Still, as with the liquidity requirements, it is possible that markets will anticipate the timetable for introduction of more demanding capital requirements and penalize banks that fail to build up the necessary capital well ahead of the required dates.

3. The end point of reform

In this section we examine the long run economic impacts of the tougher prudential standards on banks proposed in Basel III. This is the appropriate way to proceed. Assessment of the new regime should begin with the long run impact – i.e. the end point of reform. Only if there is a consensus that the long term benefits can exceed their long term costs – i.e. that this endpoint is worthwhile – and on what needs to be done in order to ensure that these net benefits are achieved, is there any point in considering how to manage the short run transition to the new arrangements.

These long run impacts must be distinguished from any short term impact on aggregate demand (total spending). Eventually aggregate demand adjusts to equal aggregate supply. Thus the short-term or even medium-term behavior of aggregate demand is not relevant to this long run analysis.

We find that the reforms could, potentially, have a substantially negative long-run economic impact. But the reason for this is not, as many think, that they will raise the costs of bank intermediation. There are strong arguments for believing that the long run costs of intermediation will be little changed and as a result, once the Basel III reforms are fully implemented, well established companies or households with substantial net worth can expect to borrow from banks on much the same terms as they would have obtained if the reforms were not carried through in the first place.

This does not mean the reforms are without costs. The point of the reforms is that they will shift exposure to extreme tail risk, from the public sector to private sector investors. This will discourage unsustainable growth of credit and systemic risk of the kind that proved so damaging in the recent global crisis. But the less welcome consequence is that this is likely also to reduce the access of riskier bank borrowers to credit. This is undesirable both in itself, because it limits economic opportunities, and also because it can be expected to reduce the future growth of output. The Basel III reforms are therefore difficult to justify unless there are effective accompanying measures promoting alternative means of access to finance, by the riskier end of the spectrum of bank borrowers.

They also appear to be inviting an undesired exposure to systemic risk that could follow from any downgrading of government debt (see discussion of liquidity requirements later in this section).

A framework for analyzing the economic costs and benefits of the new regulations

Not everything written about the new regulatory requirements, presents the issues with appropriate clarity. Here is a recent example, a paragraph from a widely publicized report by the Institute for International Finance (IIF), summarizing their analysis of the economic impact:

> *"For example, the imposition of higher capital ratios generally requires banks to raise more capital. Net new issuance puts an upward pressure on the cost of capital, which banks then add to their lending rates to the private sector. Higher lending rates reduce bank credit and, thus, the aggregate supply of credit to the economy. This, in turn, lowers GDP and employment. Higher liquidity requirements work through similar channels*." (IIF (2010), page 4).

This statement sounds plausible but it is rather misleading. The shortcoming is its confusion of supply and demand. What the IIF presumably meant to say here is that upward pressure on the cost of capital for banks reduces the supply of bank credit to the economy and this in turn raises bank loan rates. But this position has to be considered quite critically. It is not possible to analyse properly the impact of the new capital and liquidity requirements on output and employment without carefully distinguishing between their short term impact on aggregate demand (total spending) and their long run impact on aggregate supply (total capacity of the economy to produce goods and services). A key point is then that fiscal and monetary policy can be adjusted to offset the impact on aggregate demand. So a proper analysis of the long run impact must focus on the supply impact.

Let us explain this point about aggregate demand more fully. Aggregate demand, i.e. total spending in the economy, does not depend upon bank regulation alone. Yes, following the introduction of the new regulations, the cost of bank funding will rise to some degree, and this may largely be passed onto customers through higher spreads between bank lending rates and short term market rates of interest. Taken in isolation this would indeed then lower output and employment, by reducing both investment and consumer spending. But policy makers cannot be expected to ignore this impact. If the authorities are able and willing to ease monetary policy sufficiently, i.e. lowering current overnight and the planned future path of market rates of interest rates to fully compensate for higher bank lending spreads, then lending rates are unchanged and there is no net impact on aggregate demand at all.[14]

[14] As an illustration of this point, in reviewing the economic outlook over the coming two years, the Bank of England Monetary Policy Committee commented in May 2010 that 'despite some further improvement in credit

It is questionable whether, in the current extremely weak economic environment, the authorities will in practice be able to use fiscal or monetary policy to fully offset the resulting increase in bank lending rates. Fiscal deficits are widely regarded as unsustainable leaving little room for expansionary fiscal policy. Monetary policy rates in all the major countries are at historically low levels and so at or close to their zero bound; and it is unclear if the only remaining monetary policy tool, purchase of financial assets using central bank money ('quantitative easing') is an entirely effective substitute for reduction of interest rates. So in the near term it is likely to be difficult for the authorities to ease fiscal and monetary conditions sufficiently to prevent the new banking regulations triggering an undesirably large reduction of aggregate demand.

This suggests that the authorities should take extreme care with the pace of the implementation of new capital requirements. We address this transition issue below, in Section 4, proposing that the Bank of England Monetary Policy Committee (or the equivalent monetary policy making bodies in other jurisdictions) need to have the final say about the pace at which the new regulations are introduced (and about the pace with which special liquidity facilities are withdrawn).

But assuming that the authorities do not push through the regulations on a fixed timetable regardless of the consequences for total spending, then the ultimate impact on aggregate demand can be kept to small and manageable proportions. And in the long run the aggregate demand impact must be zero, because aggregate demand cannot indefinitely exceed aggregate supply (there are Keynesian arguments that suggesting that excessive shortfall of aggregate demand can lead to contraction of aggregate supply, for example from the de-skilling of unemployed workers or the liquidation of viable firms; but we are assuming that aggregate demand is managed appropriately so that this does not happen).

This confusion between aggregate supply and aggregate demand extends into the quantitative simulations presented in IIF (2010). Their model considers only the demand impact of the new regulatory requirements, calculating that this results (in the absence of a monetary policy

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supply over the forecast period, elevated borrowing costs, relative to Bank Rate, are likely to continue to act as a drag on spending. The risks around the supply of credit continue to lie to the downside. Banks made progress in strengthening their balance sheets during 2009 (Section 1), but that process may continue for a while longer, which might imply greater restrictions on domestic lending. In particular, the banking sector will need to replace a large amount of funding over the coming years, including that supported by the official sector.' See Bank of England (2010a), pages 44 – 45.

response) a three per cent cumulative fall in output over ten years, taken across the Euro Area, Japan and the United States (with a relatively larger impact in the Euro Area and a relatively smaller impact in Japan). However their own model actually suggests that, when considered from the perspective of aggregate supply, there should be a zero rather than a three per cent impact! The link between aggregate demand, aggregate supply and inflation appears in their equation (26), page 36 ($\Delta PGDP/PGDP = f$ (Output Gap), with $f'>0$) i.e. inflation increases with the output gap, the difference between actual GDP and the level of potential or trend output.

But in their model the level of trend output is exogenous and unaffected by the new regulations. If a monetary policy response is introduced into their model, so that monetary policy makers pursue and inflation target, and react to the resulting fall of inflation when output falls below trend and bring inflation back up on target, the output gap is closed and their results will vanish. Over a ten-year horizon output and employment can be brought back on track and there will then be no cumulative loss of output or GDP at all. By imposing an exogenous trend in potential output and ignoring monetary and fiscal policy the IIF effectively duck the central issue of the impact of the new regulations on aggregate supply of credit.

Still there are likely to be some tradeoffs. This was recognised by The Group of Central Bank Governors and Heads of Supervision, the oversight body of the Basel Committee on Banking Supervision, who stated in a recent overview of the new Basel III global standards that their aim "should be to achieve a better balance between banking sector stability and sustainable credit growth" (BIS (2010)). This statement is not entirely clear, but it seems what they had in mind is that the new regulations can promote greater stability of both aggregate credit growth and of the banking sector, but at the expense of some slightly lower potential output of goods and services. But, while correctly recognising that this is an issue of supply, this statement does not confront all the issues. In particular it does not address whether the most important tradeoff is with the *level* of output or (as we will argue) there is more important tradeoff with the *growth rate* of aggregate output. Nor does it consider other costs or unintended consequences.

To disentangle these issues we propose an analytical framework, distinguishing one benefit, two different costs and one further unintended consequence of reform. The benefit is the reduction in the substantial public subsidy to risk-taking in financial intermediation, as a result discouraging unsustainable increases of private sector credit that end with an abrupt cessation of credit flows and sharp falls of output i.e. the reforms should reduce the frequency of financial crises.

The two costs we examine are first the impact on the cost of bank intermediation and hence on the level of output; and second the reduction in access to credit by riskier borrowers, which can

in turn increase unemployment and reduce the growth rate of output. We will argue that costs in terms of the level of output are small; but there is a potentially more costly tradeoff with the level of unemployment and with the growth of output. Finally we argue that the focus on government liabilities as liquid assets may the unintended consequence of actually increasing the exposure of financial institutions to systemic liquidity risk, in the event of a loss of confidence in fiscal credit worthiness.

This conclusion, that the long term costs of the new capital and liquidity requirements in terms of output foregone are small and manageable seems to us to be not far from the general consensus. However, this conclusion does not take into account the impact of higher capital and liquidity requirements on access to credit or the implications for liquidity and liquidity risks. Demanding prudential requirements are justifiable, but only if we find other arrangements to replace the access to credit of fringe borrowers who would otherwise be shut out of the banking system and to ensure that liquidity is available when a shock alters perceptions about the value and tradability of assets. We therefore in the following subsections consider carefully what we regard as the more important issues about access to credit and impact on employment and growth and the management of liquidity risk.

Here we pay particular attention to the reduction in access to credit by riskier borrowers, an impact that has received relatively little attention. We assume that this effect has been largely ignored because only a fringe of borrowers is likely to be affected. However some relatively risky borrowers, such as small businesses, have little or no alternative sources of funds other than from banks. These would-be bank borrowers who lose access to credit are no longer able to easily manage fluctuations in cash flows, so that the economic costs to them of being cut off can be very much greater than the profit that the lender might be forgoing by not providing the credit in the first place.

The consequences of limiting access to credit can also have a negative impact on innovation, productivity improvements, employment and the growth rate of economic output. Not every small business turns out to be a Google, but access to credit can be a crucial constraint on innovation and growth in the small business sector. In our view reductions in the impact on access to credit, along with unintended creation of systemic liquidity risks, are a key long term economic cost of the Basel III reforms.

Is there a tradeoff between the level of output and financial stability?

While access to credit is a crucial issue, we deal first with those impacts that are relatively easier to analyse, namely the impact on financial stability and on the cost of bank credit and the level of output, postponing analysis of liquidity and of the reduced access to credit by riskier borrowers.

We first discuss the benefits of higher capital and liquidity requirements, emphasizing the importance of reducing systemic financial risk. We then turn to the widely discussed issue of the impact on the costs of bank intermediated credit. We reach a conclusion which is not immediately obvious, that there is not necessarily any long run tradeoff between the cost of credit (and hence the *level* of output) and the safety of the financial system.[15] It is possible, if the efficiency-promoting impact of higher capital and liquidity requirements prove to be strong enough, that more demanding requirements could actually reduce rather than increase the costs of intermediation and hence increase rather than reduce the level of output. But even if this argument is not accepted, it seems clear that the cost of higher capital and liquidity requirements, in terms of foregone output, is relatively small.[16]

The benefits of higher capital requirements

In discussing the benefits of higher capital requirements, we find it useful to distinguish the three main economic arguments for imposing capital and liquidity requirements on banks. The first is an older but not always widely appreciated efficiency argument that applies when there are failures of governance or competition in the banking industry. If banks are either not profit-maximisers (a standard well known example was the international expansion of French and Japanese banks in the late 1970s and 1980s which seemed to be driven by a desire to expand market share at the expense of profits) or have market power (a continuing concern about both commercial and investment banks), then higher capital requirements can also promote bank efficiency, through encouraging cost reductions or discouraging banks from seizing excessive

[15] This argument are related to and reinforce the corporate finance arguments, suggesting that a change in regulatory capital ratios has only a small impact on the costs of bank funding, put forward by Brealey (2006) and Admati et. al. (2010).

[16] Our conclusion is similar to that of Bank of England (2010b), pages 58 – 60, Miles (2010) and the Basel Committee (BCBS 2010b).

market share. This was a primary rationale for the original 1988 Basel accord on the capital of internationally active banks (Basel I).[17]

The second is the familiar bank moral hazard argument: higher capital and liquidity requirements expose shareholders to greater risk of loss and so reduce incentives for risk taking, and these incentives can lead in turn to the failure of individual institutions or of an entire banking system. Capital and liquidity requirements can give banks an incentive to securitise relatively safe assets, as a means of getting around the limitations imposed by capital requirements, so called regulatory arbitrage. Moral hazard and regulatory arbitrage were the principal rationales for the considerable effort made in the development of Basel II between 1999 and 2007, to make capital requirements 'risk sensitive'.

The third that has recently come to the fore is an externality argument. Even if banks take into account the impact of their lending and other decisions on the risks and returns of their own portfolios, they do not take into account the impact on the risk and returns of other banks. We now realize, post crisis, that these externalities can be very substantial. The banking system can increasingly sensitive to shocks as banks accumulate risk and as a result what are prudent decisions when viewed from the perspective of individual banks can, collectively, turn out to be imprudent. This is the principal rationale for Basel III, imposing such high capital and liquidity requirements that it becomes very unlikely that banks ever again engage in such excessive extension of credit that the solvency of the entire banking system comes to be questioned and hence protecting banks against such systemic externalities and consequent financial crises.[18]

The Basel Committee has recently published its own estimates of this last benefit, providing estimates, drawing on a large body of previous research, of the extent to which higher capital and liquidity requirements can reduce the frequency of financial crises and consequent loss of output. They find (BCBS (2010b) that averaging across a number of studies of financial crises in many countries, that increased capital and liquidity leads to a substantial reduction in the probability of a crisis event. For example an increase in total common equity from 7 per cent (approximately the current status quo) to 9 per cent of risk weighted assets (without any accompanying change in liquidity ratios) reduces the annual probability of a crisis from 4.6 to 1.9 per cent per annum. Naturally the probability reductions are non-linear, so further increases in capital reduce the probabilities of a crisis by less. They also find that, in the three models that incorporate liquidity impact, an increase liquidity ratios, moving to or exceeding the net stable funding requirement (NSFR) also lowers the probability of a systemic crisis

[17] See Kapstein (1994).

[18] An influential discussion of these systemic externalities is and Adrian and Brunnermeier (2009).

(although there is relatively large variation in the quantifications emerging from these three models). In effect capital and liquidity requirements are substitutes; the same reduction in crisis probability can be achieved through different combinations of capital and liquidity requirements.

The BCBS conduct two further quantifications of the benefits of higher capital and liquidity. Cross-sectional analysis suggests this may be associated with lower severity of banking crises. They also report the results of some simulations with dynamic stochastic general equilibrium models (stylized macroeconomic models with explicit treatment of the microeconomics of household and firm behavior) incorporating banking sectors, simulations which they interpret as suggesting that higher capital and liquidity requirements will lead to lower cyclical fluctuations following supply or demand shocks. But they acknowledge that these further results are subject to several caveats and do not place great stress on them in their final conclusions.

The BCBS go further, and also quantify the output losses associated with financial crises, again drawing on a large number of previous research studies. They find that the cumulative discounted output losses emerging relative to trend, is either 19% of GDP (median estimate of four studies that assume that the long run level of output is unaffected by the financial crisis) or 158% of GDP (the median of another nine studies that allow for the impact of a financial crisis on the level of GDP.-) The large difference between these two estimates illustrates that very different conclusions about the output loss associated with financial crises can be obtained, depending upon assumptions made.[19]

It is useful to quantify the benefits of avoiding financial crises in terms of GDP (expressing both the costs and benefits of capital and liquidity requirements as percentages of GDP allows the BCBS to make a simple cost benefit comparison, from which they conclude that even for very substantial increases of capital and liquidity requirements the economic benefits exceed the economic costs). But as the BCBS acknowledge, this quantification is highly uncertain. For example, they identify a number of channels through which output may be reduced following a crisis, including “a collapse in confidence; an increase in risk aversion; disruptions in financial intermediation (credit crunch, misallocation of credit); indirect effects associated with the impact on fiscal policy (increase in public sector debt and taxation); or a permanent loss of human capital during the slump (traditional hysteresis effects).” But estimating the magnitude of these impacts is a very tricky counterfactual exercise.

[19] The BCBS also acknowledge a number of other assumptions that affect these estimates, including the choice of discount rate for computing cumulative output losses (they use a relatively conservative 5%) and the different methods used to determine the end-point of a crisis.

For example all of these channels, including also unsustainable increases in debt and capital stock, while they may well *reduce* output growth after a crisis, can also be expected to work in the opposite direction and *increase* output growth in the boom period that precedes a banking crisis. In sum, while a period of higher growth following a crisis that restores output to its immediate pre-crisis path is unlikely, it is reasonable to interpret a period of higher growth *before* the crisis as being unsustainable relative to potential output capacity. In which case output may be restored relatively quickly to the level that would have obtained, had there been no overextension of bank credit and no resulting banking crisis in the first place. We simply cannot know with any certainty how much benefit there is from avoiding financial crises, in terms of avoiding cumulative output losses.

The impact of capital and liquidity standards on the cost of capital and aggregate supply

While the benefits of higher capital and liquidity standards are very uncertain, these may still be worth pursuing if the costs are comparative small. As we have already emphasised, these costs are properly understood as the reductions in aggregate supply that come about if capital and liquidity requirements make bank intermediation more costly and hence increase the cost of capital to firms for investment and to households for purchase of durables, notably housing.

Those studies which focus properly on aggregate supply yield estimates of the impact of higher capital and liquidity requirements that are very much lower than those of the IIF (2010). A widely cited study of this kind is that of Barrell et. al. (2009), sponsored by the UK Financial Services Authority. Their work uses a well established macroeconomic model of the UK and global economies. They allow for monetary policy to correct the impact on aggregate demand, so that theirs is a proper aggregate supply analysis. In their simulations this impact comes through the cost of capital for the corporate sector and hence on corporate investment, the capital stock and potential output. There is a large body of empirical research relating the cost of capital to investment, the capital stock and output; so in this respect their research seems well founded.

Less well founded is their analysis of the impact of shifts in the costs of bank funding on the cost of corporate capital. They generally err on the side of caution, making assumptions that may exaggerate this impact; for example they take no account of substitution of non-bank debt and equity for bank lending when the cost of bank loans increases, and their calculations rest on a simple econometrically estimated reduced form estimate of the relationship between bank capitalisation and the spread between corporate borrowing and lending rates (their

equation (15), page 27). Given that both corporate margins and bank capital ratios tend to move countercyclically, this estimated equation may overstate the link between bank capital ratios and lending spreads.

The key equation, at the heart of their simulations, is their equation (15), on page 27:

$$corpw = \underset{(-0.46)}{-0.196809} + \underset{(4.69)}{0.131227} \times (\log(y) - \log(ycap)) \times 100$$

$$+ \underset{(5.32)}{0.841752} \times invhead(-1) + \underset{(5.72)}{0.522302} \times insolr + \underset{(5.60)}{0.194533} \times levrr \qquad (15)$$

Sample: 1989Q2–2007Q4; Adjusted R-squared 0.64;
Some quarterly dummies are included

according to which the corporate lending spread, over and above corporate deposit rates (*corpwI)* depends on the output gap (*y/ycap*), the corporate insolvency ate (*insolrI*) and two measures related to bank capitalisation, the risk adjusted capital ratio (*levrr*) and the inverse of the buffer of free capital over and above the minimum capital requirement (*invhead*). This equation is estimated using the Johansen co-integration technique using quarterly data.]

Despite imposing apparently somewhat high assumptions about the impact of bank capital ratios on corporate lending spreads and hence on the corporate cost of capital, they still find a relatively small impact of new capital regulations on the level of productive capacity, a 1 per cent increase in capital requirements reducing potential output by only 0.08 percent. They also provide a calibration of the impact of the new liquidity requirements, based on a study of US data, and this also suggests a fairly small impact with a 1 per cent increase in liquid asset ratio reducing potential output by 0.03 percent (Barrell et. al., 2009, pg 2).

Barrell at. al. do not provide a specific calibration against the proposed reforms proposed in December 2009 by the Basel committee. Assuming a 4 per cent increase in capital requirements and a 10 per cent increase in the liquid asset ratio, changes approximately consistent with what is being required by the new Basel proposals, then the overall impact would be to reduce the level of potential output in the UK by 0.6 per cent. This is considerably less than the 3 per cent impact presented by the IIF analysis of aggregate demand for the US, Japan and the Euro area. The two studies impose similar assumptions about the increase a in the average cost of funding a bank loan portfolio, but the outcome is radically different because IIF (2010) consider only

demand effects (which can be offset by other measures) while Barrell et. al. (2009) focus appropriately on aggregate supply.

The Basel Committee analysis of the long term impact of the new capital and liquidity requirements (BCBS (2010b)) provides a much more extensive analysis of this supply impact, using a similar approach to that of Barrell et. al. Table 6 reports their calculations of the long term impact of higher capital and liquidity requirements on lending spreads. These assume: balance sheet structures that correspond to the average of 6660 banks in 13 countries over the period 1993-2007; fixed costs of short term debt, long term debt, and equity (again averages over this sample period); and a 100% pass through of funding costs onto loan interest rates. They report increases in spreads of up to 100 basis points, reduced to around 80 basis points through a readjustment of loan portfolios (when capital requirements are increased by 6% of RWA and liquidity is calibrated to the NSFR).

They then apply a combination of models to estimate the impact of higher lending spreads on the steady state level of output (i.e. the impact on aggregate supply). These models are structural models, including variations of DSGE, and semi-structural (macro forecasting models). Some models include a specific role for bank capital / liquidity, so can be quantified directly against the new standards. Where this was not present, then the model was run by directly altering costs of capital for investment according to the predicted increase in spreads.

The results are reported in Table 7, which indicates a median decline of steady state output (across 13 different models) of 0.25% as the ratio of core equity to risk weighted assets is increased by 2%, and of and 0.59%, as the ratio is increased by 6%.

In our view, these BCBS estimates, while not large, substantially overstate the long term impact on the cost of intermediation and hence on aggregate supply the level of output. i.e. in our view, the long term impacts on the level of potential output of tighter prudential requirements on banks will be substantially smaller even than those emerging from the Barrell et. al. (2009) simulations, or the analysis of the long term impact of the new capital and liquidity requirements in BCBS (2010b). In our view the new requirements could even result in a small *increase* in productive capacity. We offer two arguments in support of this view.

1. First, using an argument recently made by Elliot (2009) and previously using a similar methodology by Giles and Milne (2004), we point out that the likely increase in the average weighted cost of funding of a bank portfolio, following a change in capital ratios can be expected to be a good deal smaller than that assumed by the IIF (2010) or Barrell et. al. (2009) or BCBS (2010b). This is because of *leverage adjustment* – we can expect

some reduction in the required returns on both debt and equity, under the new more demanding requirements, because the both forms of funding are less exposed to risk; and also because of the substitution over time of non-bank intermediation for relatively expensive bank intermediation.

2. Second, we apply a check on the likely impact using a complementary approach to measuring the impact of reform on the cost of corporate capital. This is based not on the cost of bank funding but on the resources absorbed in financial intermediation. This complementary approach suggests that the efficiency impact of higher capital requirements (the rationale for the original Basel I accord) will put pressure on banks to reduce their own input costs (fixed capital, remuneration of labour, etc) and – to the extent that banks are unable to compensate for higher funding costs through lower input costs or higher loan margins -- will also lead to some reductions in financial sector profits. Lower input costs and lower profits serve to *lower* the cost of corporate capital (which ultimately depends upon the resources absorbed in financial intermediation less any subsidy from public sector support).

Adjusting the cost of corporate capital, for bank leverage and for non-bank intermediation

It is clearly an oversimplification to think that there is a fixed cost of bank capital. Brealey (2006) and Admati et. al. (2010) examine this issue from a standard corporate finance perspective returns (the analysis which supports the well known Modigliani-Miller propositions about the irrelevance of corporate capital structure). According to this perspective required returns on financial assets are determined by their contributions they make to total portfolio This in turn implies that the overall costs of bank funding depend prim.arily on the risk and return offered by bank assets. Bank funding structure, including the relative contributions of equity and debt, have only second order effects on the cost of bank intermediation, arising because of various distortions such as tax advantages of debt or disciplinary effects of debt.

Practitioners clearly believe that these distortions are material and changes in capital structure have a big impact on the cost of their funding. In this sub-section we present arguments that suggest that this takes to narrow a perspective, looking at matters from the perspective of a single bank. Even if the real world is regarded as behaving very differently from relatively abstract world in which Modigliani-Miller propositions apply, the overall impact on the costs of bank intermediation of even a bit increase in capital requirements must still be comparatively small.

Table 1a, below, based on Giles and Milne (2004), presents a calculation of the impact of the Basel III capital requirements on the cost of corporate borrowing from regulated banks. This uses a standard asset-pricing calculation (the cost of equity capital from the CAPM model of equity returns) in order to leverage adjust the cost of bank equity; and from this derive a minimum hurdle rate for corporate borrowing, based on a weighted average of total funding costs, combing the costs of bank equity and of bank debt. It assumes that the Tier 1 capital requirement rises from 4% under Basel II to 8.5% under Basel III (i.e. 6.0% minimum plus 2.5% 'conservation buffer') that the total capital requirement (Tier 1 plus Tier 2) effectively increases from 8% to 10.5% (again including 2.5% 'conservation buffer'). Table 1a does not allow for any capital surcharges to be applied to 'too big to fail' banks, since we do not know what they are to be.

Table 1a assumes that the required shareholder return on equity (the cost of equity) is 20% under Basel II, compared to a long-term risk free rate of interest of 4% i.e. the risk premium for bank book equity is 16%. This risk premium is assumed to be proportional to the leverage of the bank: for example doubling leverage doubles risk of return on equity (measured as a percentage of book value) and so doubles the required return on equity. Similarly halving leverage halves the required return.

We assume the leverage of the corporate loan portfolio is 25:1 under Basel II (a 4% Tier 1 capital requirement and a 100% risk weighting). We assume that under Basel III the risk weighting is unchanged while the leverage of the corporate loan portfolio falls to 11.8:1 (an 8.5% Tier 1 capital requirement, including the 'conservation buffer'). This causes the risk premium, which is proportional to leverage, to fall from 16% to 7.5% and the cost of equity from 20.0% to 11.5%). The resulting reduction in the cost of equity almost entirely offsets the increase in funding that comes from the shift from relatively low cost debt to relatively high cost equity. In consequence the after tax cost of funding a corporate loan book rises by only 2 basis points.

Table 1a: a leverage adjusted calculation of the cost of corporate borrowing

				Basel II	**Basel III**	**Change**
Regulatory requirements						
Value of loans €	(1)			100	100	
Risk weighting	(2)			100%	100%	
Capital requirement: tier 1 %	(3)			4%	8.5%	
Capital requirement: tier 1 + 2	(4)			8%	10.5%	

%						
Capital requirement: tier 1 €	(5)	(1)x(2)x(3)		4.0	8.5	4.5
Capital requirement: tier 2 €	(6)	(1)x(2)x((4)-(3))		4.0	2.0	-2.0
Cost of debt						
Cost of Tier 2 debt employed €	(7)	(6)x5%	5.0%	0.2	0.1	
Cost of other debt employed €	(8)	[(1)-(5)-(6)]x5%	5.0%	4.6	4.5	
Gross cost of debt employed €	(9)	(7)+(8)		4.8	4.6	
Tax €	(10)	-(9)x30%	30%	-1.4	-1.4	
After tax cost of debt employed €	(11)	(9)+(10)		3.360	3.203	-0.157
Cost of equity: baseline	(12)		20.0%			
Leverage adjusted COE	(13)	4%+[(12)-4%]x(4/(5))	4.0%	20.0%	11.5%	
After tax cost of tier 1 equity €	(14)	(5)x(13)		0.80	0.98	0.18
Hurdle interest rate on lending						
After tax break even loan charge	(15)	(11)+(14)		4.16%	4.18%	0.02%
Pre tax break even loan charge	(16)	(15)/[1-30%]		5.94%	5.97%	0.03%

The leverage adjustment is critical. Table 1b below repeats this calculation without any leverage adjustment and in this case the after-tax cost of funding a corporate loan book rises by 74 basis points).

Table 1b: Repeating calculation without a leverage adjustment

Increased Basel III capital requirements for corporate lending	**Basel II**	**Basel III**	**Change**
After tax cost of tier 1 equity €	0.80	1.70	0.90
After tax break even loan charge	4.16%	4.90%	0.74%
Pre tax break even loan charge	5.94%	7.00%	1.06%

These calculations are similar in approach to those of Elliot (2009), who obtains a similar 80 basis point figure from a 4% increase of the ratio of capital to assets, but reduces this to only 20 basis points after various offsets (reductions in cost of both debt and equity as banks become less leveraged, lower administrative and deposit costs; and competition with non-bank sources of funding; see Elliot (2009) Tables 1 and 2 for details) and Kashyap, Stein and Hanson (2010), who use Modigliani-Miller as a benchmark, calibrated using cross-sectional bank data, and who find an increase in bank funding costs and hence of lending rates of 10-18 basis points,

depending on the extent of departure from Modigliani-Miller, again from a 4% increase in leverage ratios.

Our calculations are of course making the standard corporate finance textbook but somewhat extreme assumption here that the reduction of bank leverage is reflected one for one in a lower required return on equity. But the conventional assumption of no leverage adjustment to the required return on equity is even more extreme. A more likely outcome is that the required return on equity falls but not by quite as much as our leverage adjustment suggests. One reason for expecting a smaller decline in required return on equity than shown in Table 1a is that there is a reduction of the prospective subsidy to bank intermediation from tighter prudential requirements: shareholders are now bearing more risk than before. This is of course the point of the reforms. Under Basel III, there is an increase in both shareholder risk exposure (in monetary units e.g. $ or €) and in shareholder equity stakes (again in monetary units such as $ or €). Our illustrative calculation in Table 1a allows for the increase in the equity stake (from 4€ to 8.5€) but ignores the corresponding increase of shareholder risk exposure in the rare situation of an extreme systemic financial crisis. It is possible to use an option pricing framework to obtain a present value for the decline in shareholder wealth occurring because of this reduction in the bank safety net.[20] Such a correction offsets part, but only a part, of the leverage adjustment.

Table 1a and 1b also ignore the impact of the new liquidity measures in Basel III. But a similar logic applies here, a switch from short term to long term debt finance means that the long term debt is bearing less risk than previously, and so rates of interest on long term debt may fall somewhat. In addition, so the total impact on funding costs is less than would be computed assuming that interest rates remain unchanged. .

Overall we think it unlikely that the new capital requirements will increase the cost of funding a corporate loan portfolio by more than 20 basis points. The impact of the new liquidity requirements is harder to quantify, but overall we would not expect the cost of funding a corporate loan portfolio to increase by more than 40 basis points; and as we have already argued the greater part of this impact will be offset by easier monetary policy, and through banks absorbing part of the remaining increase of funding costs through lower input costs and profits.

The impact of reform on the resources absorbed in financial intermediation

[20] See Dimou, Lawrence and Milne (2006) for a calculation of this kind.

We go further, arguing that the overall impact could in fact be to reduce rather than increase the costs of bank intermediation, at least for low risk borrowers. It is likely that the Basel III reforms will put pressure on banks to operate more efficiently and reduce their costs, through lower employee remuneration and lower expenditure on fixed capital and materials, in order to achieve a given target profitability. If so, the costs of Basel III, rather than being passed onto customers, will be at least in part absorbed by the banks and the providers of their inputs. The outcome is that the resource costs absorbed in financial intermediation, and the spreads between bank funding costs and bank lending rates, could actually fall. This suggests that Basel III could result in lower, not higher, costs of borrowing for bank customers.

What if we make the assumption found in many contributions to the current policy debate that all costs of Basel III are passed onto customers? This is another extreme assumption, and only appropriate if there is very weak competition in the banking sector so that banks enjoy substantial market power. But even if they do have this degree of market power and can pass on all changes in funding costs onto their customers, the resources absorbed in financial intermediation are still not increased by Basel III. This is the underlying reason why an easing of monetary policy can offset the long run impact on lending rates, because the Basel III reforms do not increase the banking system's use of real resources.

And if, more plausibly, we assume that banks are subject to competition in loan markets and are unable to pass on all funding cost changes to customers, then higher funding costs will actually reduce the banking system's use of resources. Once the monetary policy reaction is taken into account, this could mean that the costs of credit to bank customers could fall rather than rise. In other words, the withdrawal of the effective public sector subsidy to risk-taking could increase the efficiency of banking and thereby benefit bank customers; exactly the same effect that has often occurred in other industries when public subsidy is withdrawn.

In terms of equation (15) of Barrell et. al. (2009), reproduced above, we think that the correct sign on the leverage ratio LEVRR should be negative not positive, that higher capital requirements should reduce the corporate lending spread. The Barrell et. al. econometric estimation of this equation are a reduced form estimates that may not (despite the use of instruments) properly distinguish the long term and short term relationships between these variables. In the short term, e.g. in a lending boom, we would expect corporate lending spreads to decline, as banks chase for business, and for capital ratios to be reduced i.e. a positive relationship of the kind they report. In the long run we would expect a negative impact. It is unclear that their estimation fully distinguishes these two effects.

Thus, not only do we think that the impact of Basel III on the real costs of bank credit will be not be seriously adverse, but we also think that this impact could actually be favourable, as it might

lead to a reduction in the costs of credit of a few basis points as a result of the pressure brought to bear on banks by higher capital requirements to improve their efficiency. Contrary to the highly public debate, between the industry and regulators, we see no inevitable tradeoff between the costs of intermediation and the level of output (on the one hand) and the safety of the financial system on the other; and if there are costs these are really very low in the long run.

From this it follows, that even though the economic magnitude of the *benefits* of higher capital and liquidity requirements (in terms of greater efficiency of intermediation, lower risk of bank default and systemic crises) are highly uncertain, these are worth pursuing because the eventual *costs* of doing so are so low. Provided that is that some categories of bank customers are not cut-off from bank credit and that the very tricky transitional problems are properly addressed.

Financing of risky exposures

This conclusion, that the more demanding capital and liquidity requirements of Basel III might improve bank efficiency and lower the cost of credit for bank customers sounds almost too good to be true. Even a small increase in bank efficiency implies that there is no need to trade off greater banking system safety against higher costs of bank intermediation. But there is a serious qualification, which is that any benefits from improved efficiency of intermediation will only be available to those customers still able to access credit on currently available terms. Some bank customers, those at the riskiest end of the credit spectrum, are likely to face either much higher costs of credit or be denied access to credit altogether[21].

There are two reasons why this might happen and it is not easy to distinguish their relative importance. One is a consequence of the reforms themselves. The shift to Basel III may result in banks shifting the overall composition of their loan portfolio towards less risky exposures, those with lower risk weightings or less likely to be impaired in a major economic downturn. The other is simply the experience of the crisis has made banks all too painfully aware of what large impairment losses and credit writedowns they can suffer from exposure to the riskier end of the credit spectrum. So they are now concentrating, regardless of capital requirements, on

[21] Bernanke (1993, page 56) comments that 'if banks play a special role in providing credit to some borrowers, then a drying up of bank lending forces these borrowers to more expensive forms of credit (or denies them credit altogether). As a result, bank-dependent firms may cancel or delay capital projects, reduce inventories or even cut payrolls, depressing aggregate demand.'

obtaining wide margins from relatively safe exposures rather than pursuing rapid balance sheet growth from riskier types of lending.

So we should not ascribe all loss of access to credit to Basel III. But whether or not this is a consequence of the new proposed prudential regulations, reduced access to credit does impose substantial economic costs. We identify (without quantification) two such costs:

1. Low net worth individuals or firms with comparatively weak balance sheets are unable to manage effectively either shocks to incomes and revenues or cash flows over the household or business life cycle. Examples might be recently graduated students unable to access sufficient credit for house purchase and so having to continue for long periods in rental accommodation, ultimately transferring wealth. The economic value of access to credit is often much higher than the profit made by the bank (the customer would be willing to pay even more but still cannot get credit). Smaller companies that are dependent on banks for credit provide a relatively large share of private sector employment.[22] If bank finance is limited to the largest firms, that can in any case already obtain funding directly from security and money markets, then this may then reduce the demand for labour for any given level of output. The outcome is then higher unemployment. Unlike an increase in the cost of bank funding, this cannot be offset by monetary policy makers without creating inflationary pressures.

2. Some small companies may play an important role in both product innovation and productivity improvements. Without access to finance smaller companies can struggle to bring new products effectively to market. They are also then relatively disadvantaged compared to larger more creditworthy companies; this in turn reduces competitive pressures on large companies and discourages innovations in process and business methods that can improve productivity. We are not aware of any quantification, but it is clear that a substantial withdrawal of bank funding from smaller companies could reduce their ability to innovate and to compete and thus have a negative impact on the long term growth rate of output.

As we have said, these effects cannot just be ascribed to the Basel III reforms. Even in the unlikely event that the reforms were scrapped entirely, banks would still be much more cautious than in the past about lending to riskier borrowers. But access to credit by riskier

[22] In the UK in 2008 small enterprises, employing 49 people or less, accounted for 47.9 per cent of private sector employment, but only 36.5 per cent of private sector turnover (Calculated from Department of Business, Skills and Enterprise (2010), Table 1). The employment contribution of the very smallest enterprise (the self employed and those firms employing 9 people or less) is even greater.

borrowers is a major policy concern post crisis and the new reforms can only heighten this concern.

This concern is particularly great in those countries, including the UK, the US and others, where the large amount of household liabilities has been acquired by banks using liability management. It may well be desirable for these countries that there is a catch up in lending to smaller business. Household credit should not be too rapidly reduced either. But the experience of the crisis and the new regulations suggest that much of this lending is now regarded as too high risk to be held on bank balance sheets. Will riskier households and smaller firms become "unbankable"?

How then are riskier bank customers to be provided with credit in an era when the industry returns to traditional asset management, having to seek out funding first, before it is able to provide customer credit? There is a great deal of work to be done on this issue and we can make only some preliminary remarks:

- If these riskier exposures are too expensive to be carried on bank balance sheets then it will be well worth exploring off balance sheet i.e. securitization funding. But this will have to be done in a way which avoids repetition of the mistakes made during the securitization and structured credit boom of 2004-2007. Specifically banks will have to retain participation and avoid the very complicated tranching and structuring arrangements of the boom, which were designed more fool investors than to efficiently transfer risk.[23]

- Unlike in the last credit boom, these participations will have to be sold, predominantly, to long-term investors. Investors should be getting back cash from the paying back of bank debt and using the proceeds to invest directly in participations in bank loan portfolios. Banks should be strongly dissuaded (if they now need dissuading) from financing these securitizations using short term money market funding.

- A major issue is transparency and standards. The industry and the public authorities will have to work to establish conventions for recording and summarizing loan pool qualities. Investors should be able to look beyond credit ratings and be able to do their own due diligence in assessing whether or not a particular securitization is worth undertaking.

[23] On the use of complex tranching as a response to investor mis-pricing, see Brennan et- al (2009).

- There may also be scope for non-bank lending that entirely circumvents banks, so that origination is done by brokers or by loan market specialists
- There should also be a renewal of the provision of debt finance to the private equity industry. Again this should be done in a way that appeals best to long term institutional investors.
- Microcredit institutions, such as the Grameen bank in Bangladesh, may turn out to be of increasing relevance to the developed world as well as the developing world. Efforts need to be made to continue and build on the limited amount of microcredit lending currently taking place in developed countries.
- Regulatory and legal barriers to such innovative financing may need to be addressed. For example we understand that loans cannot be included in mutual funds in Europe, under the UCITS directive. This is not desirable, provided there are safeguards to protect investors then they should be able to purchase participation in funds consisting of bank loans.

To conclude, we believe that discussion of the costs of Basel III have paid too much attention to the costs of intermediation and not enough to negative impact on access to credit by riskier customers and consequences for employment and long term growth. If the reforms are to be worthwhile then they have to be accompanied by measures, such as the re-establishment of securitization vehicles holding risky loan exposures, which will help bring investor funds to riskier borrowers, off rather than on bank balance sheet. While Basel III is not itself the sole or even the major reason why riskier borrowers are now, post-crisis, finding it difficult to access bank credit. But this problem will have to be addressed in the few years and it will be appropriate to promote it as an alternative means of providing private sector capital backing of loan credit instruments.

Liquidity

The liquidity proposals of the Basel Committee represent the first substantive internationally-agreed proposals for the regulation of bank liquidity. They represent a big change in regulation and have very large implications.

The objectives of the liquidity proposals seem clear:

1. To increase the amount of liquid assets held by banks and reduce their reliance on short-term wholesale funding.

2. To limit the extent to which banks can perform maturity transformation.

In order to achieve these objectives, the proposals will force banks to retreat from the business model that was widely adopted in the UK in the 1970s and 1980s after credit rationing was abandoned. While credit rationing was in force in the 1960s and earlier, the banks' assets were in effect determined by the monetary authorities, who dictated how much each bank could lend in total. The job of the banks was to choose which loans to make. There was no point in banks competing too hard to raise deposits, because additional deposits could not be profitably lent. The abolition of credit controls in 1971 made it possible for banks to decide for themselves what their total assets should be, and they adopted a 'liability management' model, in which marginal liabilities, to finance whatever assets the banks had chosen to acquire, were obtained from liquid wholesale markets.

The financial crisis has exposed the limits of liability management and the proposed regulation will make the retreat from liability management permanent. To a much greater extent than at any time since the 1970s, banks will be forced back towards 'asset management', in other words towards a business model in which balance sheet size is determined from the liabilities side of the balance sheet, by the amount of funding which the bank can raise, and in which asset totals have to be adjusted to meet the available liabilities. This amounts to a 'macro-prudential' policy – that is, a policy designed to prevent credit creation from 'getting out of hand' as it did in the run-up to the recent crisis[24].

The financial crisis represents a once-in-a-lifetime opportunity for regulators to impose radical changes on the banking industry. In cases where they were in doubt about how tough the proposals should be, they are likely to have gone for the tougher option, knowing that the climate of opinion will probably never be as favourable for them as it is now, and that it will be easier, if necessary, to ease up than to tighten in the future.

The effects of the proposals can be looked at from two perspectives:

1. The quantitative perspective – the amount of liquid assets that the banks will have to amass in the next few years, both to meet the new requirements and to repay special facilities provided by governments and central banks, which it is assumed will not be renewed. There is clearly a potential transition problem which needs to be considered in

[24] See Hannoun (2010), who comments that the 'enhanced Basel II framework and the macroprudential overlay are together being referred to as Basel III.'.

determining the timing of implementation of new regulations. The timing of the transition problem has already been discussed in Section 2 and will be explored further in Section 4.

2. The structural perspective. This refers to the ways in which the funding and liquidity management, not only of banks but also of their customers, will be permanently affected by the proposed regulations. What may appear to be rather detailed aspects of the proposed regulations may in fact have very serious implications for financial stability in the future.

This section analyses the latter structural implications of the proposals, identifies what we consider to be some shortcomings, and suggests ways in which the proposals could be amended to better achieve their objectives. We make no comment on whether it is desirable to regulate bank liquidity by setting minimum liquid asset ratios, since we regard the imposition of such ratios as inevitable[25].

We first identify several particular aspects of the proposals which we regard as crucially important.

First, the proposed definition of liquid assets. The proposed definition is heavily weighted towards government securities and other liabilities of the public sector, such as deposits in the central bank. [26] Some claims on the private sector will be considered, such as corporate bonds and covered bonds, but subject to haircuts of 20% - 40% and a number of other conditions such as 'proven record as a reliable source of liquidity in the markets (repo and sale) even during stressed market conditions'. The conditions are drawn so tightly that it seems unlikely that a large volume of claims on the private sector would be eligible, at least initially; more important, the supply of eligible claims on the private sector could not be expanded quickly at a time of liquidity pressure because of the need for a 'proven record', which would necessarily take time to establish, and because it might also take time to meet some of the other conditions.

Second, the proposed Liquidity Coverage Ratio will require banks to hold 100% liquid asset coverage against net cash outflows over the next 30 days in a hypothetical stressed situation.[27] In the hypothetical situation, it is assumed that no unsecured interbank deposits, and no repos except of government securities, would be renewed. Therefore banks will have to hold 100%

[25] See Goodhart (2007) for a view on this issue.

[26] See BCBS (2009c), pages 9 – 11.
[27] See BCBS (2009c), page 14.

liquid assets against any unsecured interbank deposit liability. Unsecured inter-bank borrowing for maturities of less a month will be uneconomic and the market is likely to atrophy. Even at longer maturities, borrowers will have to allow for the need to hold 100% liquid assets against the liability once its residual maturity falls to 30 days, and market activity at these maturities is likely to decrease greatly. The same applies to repo activity except in government securities.

Third, the proposed liquidity coverage ratio will also require banks to hold 100% liquid asset coverage against liquidity commitments (eg back-up lines) made to non-financial corporate and other customers. These include facilities granted to support financing vehicles such as asset-backed commercial paper and other security issues[28].

The proposed definition of eligible liquid assets is likely to mean that bank liquidity will be heavily concentrated in government securities. This is likely to have the following consequences, all of them undesirable.

1. Banks will be obliged to maintain large-scale credit exposures to governments. Governments will therefore be partly exempted from normal market tests of creditworthiness.

2. The market for government securities will be distorted by inelastic demand from banks. Governments will have a uniquely privileged position in financial markets which will give them access to cheap credit. This is a privilege which governments in many countries have abused in the past, when they have possessed it. Liquidity in the government securities market would deteriorate, because large amounts would be locked up in the banks' liquidity portfolios.

3. If a government nevertheless lost creditworthiness and its debt lost its 0% weighting for Basel II purposes, then its securities would suddenly become ineligible liquid assets. Banks holding them would find that they had both lost both market value and liquidity at the same time. Such an event would seriously aggravate the risk of financial instability that the deterioration of government credit would have caused in any case.

4. The pressures on central banks to monetise the debts of governments which get into financial difficulty will be much more intense than they would have been if commercial

[28] See BCBS (2009c), page 17.

banks were not obliged to hold government securities to meet liquid asset requirements.

In addition, the proposals do not make it clear what banks in countries where only small amounts of government debt are outstanding, such as Australia, are to use as liquid assets.

Our view is that the concentration of commercial banks' liquid assets on government securities, which the proposed liquidity regulation seems almost to mandate, is destabilising and extremely dangerous. It has the capacity to aggravate seriously the consequences of any future sovereign debt crisis. The unintended consequence of a measure designed to secure financial stability could be, perversely, to create financial instability. The only way to overcome this serious defect in the proposal is to enlarge greatly the opportunities for liquid assets to be created out of the banks' claims on the private sector. The admission as acceptable liquid assets of commercial bills of exchange (see box) is one promising way forward, and it is surely not beyond human ingenuity to find others.

Bank need sources of liquidity to enable them to accommodate fluctuations in their cash flow, in addition to meeting whatever liquidity requirements are imposed on them by regulators. Until recently, much of the required liquidity has come from the unsecured inter-bank deposit market, but it seems unlikely, as explained above, that the inter-bank market can continue to provide much liquidity. Instead, liquidity will have to come from the assets side of the balance sheet. Banks need a stock of assets which they can trade with each other so as to provide liquidity.

This need has existed for many decades, since long before the development of liquid government securities markets. Short-term bills of exchange representing self-liquidating transactions, whose conclusion will generate the funds necessary to redeem the bill, represent precisely the kind of instrument that banks will need in the world of Basel III. Moreover, they have the considerable advantage that they represent a form of liquid asset that banks can generate from their own operations with their commercial customers, and which does not indirectly subsidise government borrowing. Bills of exchange are described in more detail in the box.

BOX COMMERCIAL BILLS OF EXCHANGE

According to section 3 of the Bills of Exchange Act 1882,

A bill of exchange is an unconditional order in writing, addressed by one person to another, signed by the person giving it, requiring the person to whom it is addressed to pay on demand or at a fixed and determinable future time a sum certain in money to or to the order of a specified person , or bearer.

The person who gives the order is called the drawer. The person thereby required to pay is called the drawee. If he assents to the order, he is then called the acceptor. An acceptance must be in writing and must be signed by the drawee. The mere signature of the drawee is sufficient (section 17). The person to whom the money is payable is called the payee. [29]

Bills of exchange have been used to finance commercial transactions since the middle ages. Some kinds of bills of exchange have inherent liquidity, in that they are financing vehicles for transactions that will be completed by the time that the bill matures, and which, when completed, will generate the funds needed to redeem the bill. For example, bills of exchange have been used to finance the transport of goods from the place where they were produced to the place where they are sold. The producer gets value for the goods (from the buyer of the bill) when he parts with them, while the buyer pays for them when he gets them. The sale proceeds finance the redemption of the bill.

Bills can be accepted by bankers to enhance their credit quality. By accepting a bill, the banker takes on the liability for payment if the drawee fails.

In the 19th century, central banks regarded self-liquidating commercial bills accepted by reputable banks as attractive investments, on account of both the good name of the acceptor and the fact that the underlying transaction would provide the wherewithal to redeem the bill. Indeed, after the end of the First World War, the Bank of England exhibited a preference for commercial bills over the then-widespread Treasury bills in its market operations. The Bank of England, then and later, made it a practice to monitor the quality of commercial bills circulating in the London market, so as to ensure that the underlying transactions were of the self-liquidating nature required to ensure the liquidity of the bill[30]. It did so through its purchases of bills from the market; any bills which were deemed unsatisfactory were returned to the seller

[29] Encyclopaedia Britannica, 1911 Edition, 'Bill of Exchange', available at http://en.wikisource.org/wiki/1911_Encyclop%C3%A6dia_Britannica/Bill_of_Exchange .

[30] See Sayers (1976) chapter 11.

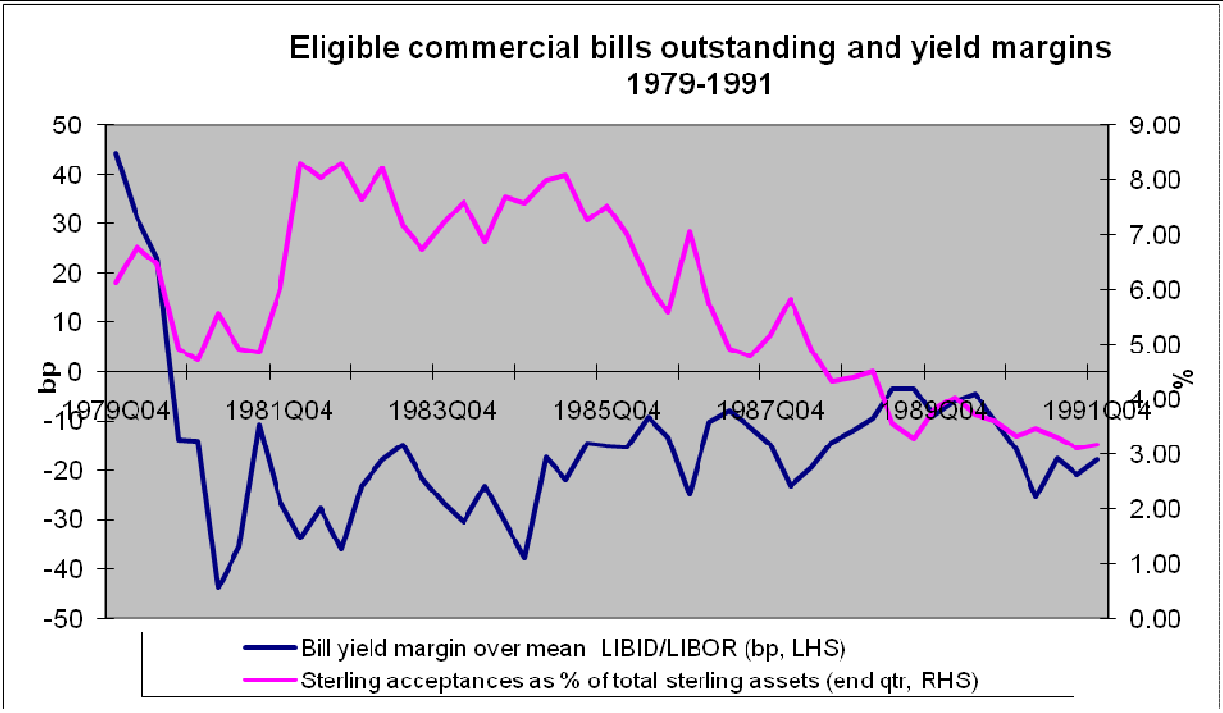
and had to be replaced. In modern language, this was a method of supervising the liquidity of commercial banks.

This insistence that bills sold to the central bank should be self-liquidating should be distinguished from the 'real bills doctrine', according to which, it was alleged, central bankers believed that provided they discounted only 'real', i.e. self-liquidating, bills, then their operations would not be inflationary. There have been extensive debates about whether central banks ever regarded the 'real bills doctrine', as thus defined, as a useful guide to their decisions about how much credit they should create[31], and about the merits of the real bills doctrine as a guide in such matters. Those debates are however not relevant to the point at issue here, which is about commercial bank liquidity, and not about credit creation by the central bank.

It would be a mistake to think of commercial bills as a historical curiosity of no modern practical importance. In the early 1980s, the volume of commercial bills increased massively, stimulated by purchases by the Bank of England which were a consequence of the policy of overfunding the government budget deficit which it was then pursuing. This is illustrated in graph A, which shows the volume of eligible commercial bills outstanding and the average differential between commercial bill yields and the mean of LIBID and LIBOR. The quantity of eligible commercial bills outstanding increased from 4.6% of commercial banks' total sterling assets in 1981 Q3 to 8.2% in 1982 Q2. The yield differential required to generate this additional volume of commercial bills was fairly modest, as the graph shows. This episode demonstrates the banks' ability to generate large quantities of high-quality liquid assets from their loan portfolios.

Graph A

[31] See for example Wood (2008).



Source: Bank of England Quarterly Bulletin, various issues, table 3.1 (quantities), Bank of England Statistical Interactive Database and authors' calculations (yields).

It had become common practice before the financial crisis for banks to securitise assets by packaging and selling them to investors. Indeed this was a key feature of Northern Rock's business model, and the one which led it to disaster. The practices followed when assets were securitised failed to provide an adequate assurance to the buyer of the assets about the credit quality of the underlying assets, despite the routine involvement of rating agencies. Notwithstanding this unhappy experience, the new capital and liquidity requirements will greatly increase the pressures on banks to get assets off their balance sheets and, therefore, to find ways of reassuring investors about the quality of securitised assets. They can hardly escape from this task, since it seems unlikely that new kinds of providers will enter the market, in the near future at least, as originators of mortgages in particular, so that banks and building societies are likely to perform this function.

The methods that banks use to reassure investors about asset quality are likely to include giving undertakings that they will retain a minimum proportion of the assets in question on their own

balance sheet, so as to demonstrate that they share the investors' interest in the quality of the assets[32].

What will the function of the liquidity regulators be in the world of Basel III? In normal times, and assuming acceptance of our suggestion that the range of assets eligible to be counted as liquid should be greatly broadened, their functions would include ensuring that the assets which the banks were using to satisfy their liquidity requirements met required minimum standards of liquidity. Even if our suggestion was not followed, the financial stability authorities would also need to develop a contingency plan for dealing with a liquidity crisis, which would necessarily involve:

1. the regulators being ready to reduce minimum liquid asset ratios promptly to enable liquidity to be used when it was needed.
2. the central bank being ready to purchase eligible liquid assets without stigmatising the seller as a weak bank.

There would be strong grounds for publishing such a contingency plan. Central banks have traditionally followed a policy of 'constructive ambiguity' in public statements about emergency liquidity provision, for fear of creating moral hazard by offering reassurance that liquidity would be provided in case of need. However it has been demonstrated during the crisis that central banks have no option in situations of financial instability but to provide liquidity where it is needed, willingly or unwillingly. So there is no ambiguity left. At the same time, if one of the purposes of the central bank is to provide liquidity insurance, it is surely reasonable for the public to know what the terms of the insurance are. As Shafer (1982) comments, 'failure to keep markets informed of true intentions may increase the instability of liquidity management by banks and their customers'[33].

To be more specific, a commercial bank which wanted to reduce to zero the risk that it would at some point become illiquid would need to hold 100% of its assets in currency, and charge customers for the services it provided in taking deposits, unless it knew the circumstances in which emergency liquidity would be provided. Any more adventurous investment policy involves some degree of liquidity risk. It has long been thought desirable for banks to accept some liquidity risk, even if the risks taken have clearly been excessive in recent years. Coherent

[32] For further discussion of issues related to securitisation of mortgages, see Bank of England (2009b) pages 16 – 18.

[33] Shafer (1982, page 144).

risk management on the part of commercial banks is impossible if the intentions of the provider of emergency liquidity are undisclosed.

4. Coping with transition

As noted above, the regulatory changes seem designed to reverse many of the changes that have taken place in banking in the past few decades and to cause commercial banks' balance sheets to reduce in size.

We believe that this will create considerable challenges to economic policy makers during the transition to the new regime. There are three different, but interrelated, sources of problems for economic policy. First, the substantial balance sheet adjustments, with the danger that in the short term these are made through rapid reductions of bank credit. Second, these changes could end up being imposed in a malign economic environment, where the continued overhang of private sector debt inhibits growth and the correction of structural fiscal deficits is further sharply reducing aggregate spending. Third, there could be a decline in long term rate of growth of productivity and potential output, partially triggered by a reduction in the availability of bank finance for riskier borrowers.

The required balance sheet adjustment.

The required adjustment has three components.

1. The commercial banks have to substantially adjust their balance sheets, not only to increase their capital ratios but also to meet the required minimum ratios under the LCR and, eventually, the NSFR. In addition, they have to repay the liquidity support provided to them by their central banks and governments during the crisis.

2. Since liability management will be greatly constrained, commercial banks will need to hold liquid assets to manage their cash flows. The liquid assets that they hold to satisfy the minimum ratios will not of course be employable for liquidity purposes under normal circumstances, so they will need additional assets for practical use. As noted above, there are strong grounds for the regulatory authorities publishing their contingency plans for managing a liquidity crisis, and the contingency plan would provide an indication of the circumstances in which minimum liquidity ratios would be relaxed and by how much. Provided the responses of the authorities are made clear, in

this way, the amount required for cash flow management will probably be much less than the amount required to meet the minimum ratios, both because the minimum ratios are likely to mandate much larger liquid asset ratios than the banks would voluntarily hold and because the banks will then know that in extreme conditions the minimum ratios will be relaxed and their mandatory liquid assets will be usable.

3. Bank customers' opportunities for liability management will also be constrained. For example, companies will find it much harder to get back-up liquidity commitments to support commercial paper programmes; and overdraft facilities are likely to become more expensive. Therefore bank customers, too, are likely to need to build up stocks of liquid assets.

In sum, the proposed regulatory changes are likely to lead to an upward adjustment, possibly very large in size, in demand for liquid assets on the part of both banks and non-banks (in fact, the adjustment will already be under way). The necessary funds to acquire liquid assets could be found from issues of equity or longer-term debt, or from retained profits, or from balance sheet contraction, which, for unchanged stocks of liquid assets, would increase liquidity ratios. Therefore there will be a demand from banks in particular to raise longer-term funding or new equity.

Section 2 discussed the first component of the adjustment only. This first component of the adjustment is likely to be very substantial. Moreover it will be a concerted adjustment across all banks rather than being confined to a single bank or a small group. No comparable adjustment has occurred for many years and it is therefore very difficult to predict the consequences with any confidence.

An uncertain macroeconomic environment.

This major balance sheet adjustment will have to take place during a period when the macroeconomic environment is unusually uncertain. The household sector in many countries, notably the United States and the UK, has historically unprecedented ratios of debt to income and has moreover, experienced substantial decline in net worth from falling house prices. At the same time several countries, including most of those in the European Union, are beginning a period of substantial fiscal consolidation, with a planned fairly rapid reduction in government spending and government deficits. While monetary policy will certainly continue to be very easy, the limitations imposed by the zero bound on interest rates may well make it difficult for the authorities to offset the consequent reduction of aggregate demand.

One key policy issue is the effectiveness of 'un-orthodox' monetary policy tools, such as central bank open market purchase of government securities (generally referred to as "quantitative easing") or private sector securities (termed by Bernanke (2009) as "credit easing"). We do not know how powerful these tools are.

The reduced risk appetite of the banking system.

The uncertainty of the macroeconomic environment is exacerbated by the reduced risk appetite of the banking system, in comparison to the years immediately preceding the global financial crisis. As a consequence of reduced leverage and higher capitalization, returns on equity will not return to pre-crisis levels or example UBS predicted in March 2010 that globally bank RoE will decline from over 16% pre-crisis to around 13% in coming years). Balance sheet growth will also be relatively slow. What matters most then to bank decision-making is the *relative* emphasis the market comes to place in determining bank share valuations on earnings and on growth performance. The basis of market valuations has shifted, probably permanently, relative to the pre-crisis era, with a greater emphasis on earnings and margins, and a lesser emphasis on balance sheet growth. While UK banks may ultimately turn out to have sufficient capital to support their balance sheets, without any of them needing to raise substantial additional equity capital, they are very unlikely to embark on rapid balance sheet expansion. Rather it is likely that banks will emphasise the maintenance of high lending margins, in order both to rebuild their balance sheets and to persuade investors that they are achieving appropriately high earnings on their assets.

Indeed the principal danger is that these high lending margins, together with banks caution about the provision of credit, despite historically low levels of interest rates and holding unprecedented levels of central bank reserves as a consequence of unorthodox monetary policy, will dampen private sector demand. The banks themselves may interpret most of the slow growth or even decline in their lending, as a consequence of lack of demand for credit not a refusal to supply credit. But still the overall impact will be to reduce aggregate demand, making the transition to a new system with higher levels of capital and liquidity especially tricky.

How to manage the adjustment.

The new regulations, which are global in prospective application, will constrain the supply of maturity transformation services provided by commercial banks[34]. Maturity transformation is borrowing short and lending long. The new regulations will increase the demand to lend short (i.e. hold liquid assets, as already described) and borrow long. The scale of the change is hard to measure precisely but it is clearly very large. It will require not only commercial banks and their customers but also investing institutions to adjust their business strategies.

The effect on GDP of curtailing commercial banks' activities depends in part on to what extent, and how quickly, other channels of financial intermediation can fill the gap left by the banks. It is clear that the political process has determined that commercial banks' activities should be curtailed in the interests of avoiding future financial crises. It is not clear that there will be no cost to output, even though, as noted above, there are some grounds for thinking that the long-run cost will be small.

The necessary strategic adjustments will take time. The commercial banks are already well aware of the need to adjust, and so, probably, are many of their customers. However it is possible that investors – institutions that are potential suppliers of long-term funding – perceive the need for adjustment as a less immediate one because it is conveyed not by the threat of imminent financial failure or regulatory action but by the emergence of new investment opportunities. Investing institutions will take time to consider these opportunities, partly because that is their normal procedure, partly because prospective regulatory changes and general economic uncertainty mean that the outlook for commercial bank profitability is very uncertain, and partly because governments which bought bank equity in the depths of the crisis are likely to want to sell their stakes once market conditions improve.

It is very difficult to know how much time the adjustment is likely to require; it depends in part on how long it takes to finalise the new regulations and any other measures such as bank taxes.

Most analysts are focusing on the medium term impact of the new regulatory regime, with a working assumption of a reasonably benign economic environment, with loan impairments and credit writedowns gradually reducing from the peaks of 2009. This cannot be taken for granted. The combination of rapid reduction in fiscal deficits and modest growth of bank balance sheets might not be consistent with the steady increase in private sector spending that would be needed to maintain real output growth. There could then be a renewed recession with increasing loan impairments and writedowns of tradable bank assets. Matters need not necessarily work out in this way; there could be substantial contributions to demand from various other sources, for example final demand in emerging markets, lower imports, higher

[34] On maturity transformation by banks, see Allen and Carletti (2008).

corporate investment, and reduced household savings. Bank credit could be replaced, in part, by increased credit intermediation on securities markets (e.g. through issuance of corporate bonds or traded corporate bank loans). But there are clearly substantial challenges to be overcome if private sector spending is to rise and absorb the slack created by reduced government expenditure and higher taxation.

We comment briefly on the work of the Macroeconomic Assessment Group established by the Financial Stability Board and the Basel Committee on Banking Supervision. In its interim report (MAG 2010) provides estimates of the costs in forgone output of the transition to higher capital and liquidity requirements. There are two main points to be made about this work. The first is that the estimated effects are actually rather large (so the work published by the BIS is consistent with our own analysis, the long term impacts are modest, but the short term transition is difficult).

MAG (2010) reportsBasel III simulations run using a total of no less than 89 macroeconomic models, contributed by different members of the study group, most individual country models and some multi country. These models included both large "semi-structural" macro models, of the kind used by central banks and finance ministries for economic forecasting, and theoretically based dynamic stochastic general equilibrium (DSGE) models, some with banking sectors included and some without.[35]

MAG report that the resulting changes of lending spreads, resulting from a one percentage point increase in the ratio of total common equity to risk weighted assets, would reduce GDP relative to baseline trend by roughly 0.16%; that taking into account increased reductions of credit supply and tightening of lending standards at any given price, would raise this to 0.32%; but that an offsetting monetary response can reduce this impact to 0.17%. These are the median predictions from the 89 model simulations that they run.[36] A common assumption here is that banks maintain a fixed return on equity, so that higher capital requirements translate directly into higher rates to borrowers. Most of these models do not allow for international

[35] Many of the 89 models did not include a banking sector. In order to use those models that did not contain a banking sector, MAG used supplementary simulations based on other models (16 "satellite models" linked to large scale models, and 13 DSGE models with banking sectors) to calibrate the impact of bank capitalisation and liquidity on lending spreads. These changes in lending spreads were then fed into the main macromodels.

[36] The MAG simulations also report a somewhat smaller impact from higher liquidity requirements, with a 25% increase in the holding of liquid assets, combined with a lengthening of the maturity of liabilities, resulting in a median decline of GDP of 0.08% over four years.

spillover effects, but simulations of the IMF international model suggests that these are relatively small.

These are large numbers. MAG (2010) does not discuss the impact of Basel III; their analysis assumes a 1% increase in common equity as a percentage of RWA. Basel III will have a much larger impact than this. The Basel III announcements of September 12th, 2010, once allowance is made for the change in risk weighted assets and for the additional mandatory and discretionary capital buffers, will increase required regulatory capital for large institutions substantially, perhaps from 2% to 10%. While the MAG simulations are based on total capital, not regulatory capital, one might assume that the buffer of capital remains unchanged. The implication of such an 8% increase in required regulatory capital were implemented in one go, then over the years 2011-2015, *even if monetary policy is successful in offsetting the impact of Basel III,* then there will a 1¼% reduction of global GDP relative to trend; but that if monetary policy makers are unable to offset then there will be a 2½% reduction in global GDP relative to trend. Over the longer term output can then be expected to be restored much closer to trend, in line with the assessment of the long term impact study BCBS (2010b). The MAG work thus provides a strong justification for the extended timetable now announced by the BCBS, with full implementation to Basel III not taking place until 2019.

But the more serious problem is that they are derived from models which are largely irrelevant to the challenge of modelling the current transition to higher capital and liquidity requirements. They do not incorporate liquidity effects and are therefore ill-equipped to answer questions about bank regulation, particularly regulation of liquidity. The models used are estimated over a run of years, in which liquidity was abundantly available and bank balance sheets were not constrained. The models themselves yield a huge range of predictions for the impact of the new regulations. [37] We therefore do not attach much weight to these estimates. We do not think it is possible to assess the costs of transition without considering explicitly what the transition is likely to involve. And we think it inevitable that this assessment must be primarily qualitative (thinking about the mechanisms and constraints involved) not quantitative. The effort made by MAG to use a vast suite of quantitative models to answer essentially qualitative and structural questions is heroic and, fundamentally, misguided. Ignoring all the lessons of experience, they

[37] We also note the huge variation in predictions of the 89 different models used as inputs to MAG (2010). A number of these yield output predictions, three time as strong as the median reported by MAG, thus the output impact of an immediate introduction of Basel III (without taking account of monetary easing), could result in a fall of global output below trend of as much as 7½%. Others yield effects much smaller than the median, so the impact (taking account of monetary policy easing) could be less than ½%. The real conclusion to be taken from the MAG work is that we simply do not know how large are the transition impacts on output.

are repeating the mistakes of the past, relying excessively on formal, sophisticated (and hence opaque) models, an approach that makes it extremely difficult to exercise economic and business judgement. This excessive optimism about what can be achieved using formal modelling is a major reason why risk managers and regulators failed to adequately anticipate the global financial crisis. As we recover from the crisis we should certainly not repeat this mistake.

This is not to say that that the required adjustment will be easy. It is a profound structural change and it is likely to take a considerable time to complete, even though it has clearly begun already. It would obviously be desirable for the adjustment to take place at a pace which minimized the adverse effects on output and employment, but it is impossible to know in advance what the optimal pace would be. The only way to find out is through experience. In our view, the longer transition period that has now been decided on is likely to create less stress than the shorter one originally proposed, but there is still a considerable risk that a requirement to complete the mandated adjustments by any particular fixed date will have adverse effects on the recovery of economic activity.

Clearly there is an intimate connection between the impact of new regulation and the desirable stance of monetary policy. The pace at which the new minimum capital and liquidity ratios are increased gradually to their final levels in the UK may affect macro-economic conditions, including the rate of inflation, and should be determined by the Bank of England Monetary Policy Committee as part of its regular decision-making process[38]. It is curious that this possibility has curiously not been discussed.

In the same vein, the Monetary Policy Committee should be empowered to extend the maturity of the special liquidity assistance extended to the banks during the crisis if it considers it desirable to do so[39]. Assigning this responsibility to the MPC would mean that the withdrawal of liquidity support could be accomplished gradually in a way which was sensitive to its effects on the supply of credit and the economy.

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[38] The speed of transition which the MPC determined would need to be fast enough to meet the final deadlines announced by the Basel Committee on September 12th 2010. The Basel Committee itself would be wise to keep the final deadlines under careful review and to be willing to extend them if economic recovery was faltering.

[39] This would not be unprecedented. Up to the 1980s, 'monetary policy' in the UK was generally understood to involve decisions not only about interest rates but also about injections or withdrawals of liquidity to or from the banking system. And in the United States, the Federal Open Markets Committee, which is responsible for decisions about short-term interest rate policy, is also responsible for decisions about open-market operations.

Finally we emphasise the need for the authorities to communicate, simply and clearly (and without relying on formal model simulations, because these simply create misunderstanding and mask the real issues), what the new financial landscape will look like. The fundamental challenge is the co-ordination problem that always arises in any period of deep structural change. Investment institutions need to be persuaded that the new environment, in which they have very much more substantial holdings of bank equity and long term debt than in the past, is in fact benign, and that they can earn reasonable returns on this equity and debt. That this can be a system where through holding of these long term instruments, investors provide the liquidity required by both banks and their customers. And that a healthy banking system will then provide the underpinning for future growth, growth that will be all the stronger if they are also willing to participate in securitizations and other traded instruments that finance riskier borrowers that are otherwise not 'bankable'.

The alternative scenario is one in which the buy side of the market holds bank debt and equity only reluctantly, in which liquidity and short term credit is strictly rationed and subject to periodic famine, and in which investors provide little of the funding needed by bank borrowers at the riskier end of the credit spectrum. This is a world of low economic growth, indeed stagnation, and one in which all investment returns will be extremely disappointing. Persuading the markets to 'buy in' to Basel III should be an easy sell, because the alternative is so bleak.

5. Summary and conclusions

Basel III will dictate profound changes in the banking industry. The liability management model which has prevailed since the lifting of credit controls in the 1970s is no longer operable and will have to be replaced with a new model in which the size of bank balance sheets is determined by their ability to raise funds, and not by their ability to find attractive assets. There is no reason to think that banking will cease to be a viable industry, but the changes will take a long time to complete and will have effects well beyond the banking industry itself.

Our analysis rejects the rather simplistic debate between the industry on the one hand, complaining that the new regulations will increase the costs of bank intermediation, and the authorities on the other, who stress the need to sacrifice output in order to prevent any future financial crisis on a scale even approaching that of 2007-2008. We find that in the long run there may be few real resource costs from having a safer financial system. There might even not be any need to trade-off the level of output and the safety of the financial system at all.

That said, at the same time the challenges of transition and the structural implications of reform are profound. While the adjustment is in progress, there are material risks that the supply of credit to the economy will be disrupted by the implementation of the new regulations. Moreover – as we emphasise –the long run rate of growth of the economy will be adversely affected if small businesses are unable to get adequate access to finance.

It is impossible to measure these risks with any confidence but there is a powerful argument for managing the transition process carefully and being ready to adjust it in the light of experience – 'learning by doing'.

For example, the timetable for the introduction of new minimum capital and liquidity ratios could usefully be adjusted if necessary in the light of economic developments; though the Basel Committee has set end-dates by which the various aspects of the transition have to be completed, there is national discretion in the speed of transition subject to those end-dates (but note this might require greater flexibility in the intermediate dates for achieving minimum capital requirements, than announced by the Basel Committee on September 12th, 2010). Moreover, the timing of the withdrawal of the emergency liquidity facilities provided by central banks at the depth of the crisis might be kept under review. In the UK, decisions on these matters could and should be made a part of the normal monetary policy process conducted by the Bank of England Monetary Policy Committee.

Some aspects of the proposals need to be reviewed, especially the definition of the range of assets eligible to meet the liquidity requirements. The proposed definition is dangerously

heavily concentrated on government debt and it needs to be broadened to enable banks to generate liquidity from their commercial assets.

The 'buy side' of the market also needs to be brought into the debate on the structure and operation of the banking industry to a far greater extent than has occurred hitherto. They need to be brought 'on –board' in terms of their willingness and capacity to hold more long term bank liabilities and less short term money market instruments; and they need to be involved in the essential task of identifying and developing new forms of intermediation to relatively riskier borrowers such as small businesses. The authorities need to shoulder the responsibility (which they have so far shirked) for communicating the essential need for these changes, in order to restore investment, growth and the normal functioning of the financial system.

Finally, in the light of the experience of the recent crisis, there clearly needs to be adequate contingency planning for any future crises. There is a strong case for publication of the plan, including information about the circumstances in which emergency liquidity assistance might be provided.

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